Summary of Terrestrial Resource Studies in Great Lakes Inventory and Monitoring Network Parks

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INTRODUCTION

Studies of terrestrial ecosystem components vary more among Great Lakes Inventory and Monitoring Network (GLKN) parks than studies of any other ecosystem component. At a given park, the extent of terrestrial inventory, monitoring, and research is directly related to the natural resource management needs of the park, the size and composition of the natural resource staff, and the base and projected funds they obtain. These in turn, are a function of both the park landscape and purpose for which it was established. Some Network parks have ongoing long-term monitoring programs for key terrestrial components, as well as some survey, inventory, and indepth research efforts. Other Network parks have undertaken only limited inventory or monitoring projects.

The ability to compare terrestrial resources among Network parks, is hampered by the patchwork of existing monitoring programs. One overarching goal of the GLKN monitoring program is to develop monitoring protocols that can be used to address specific management needs of individual parks, while at the same time allowing Network-wide data synthesis and analysis. Achieving this goal with the terrestrial monitoring protocols may be especially challenging due to the variety of current projects and management needs of parks. Ongoing and recently completed research by Network parks, including biological surveys, inventories, and monitoring projects, are summarized below. These summaries were compiled by searching the literature in the NPS database NatureBib, as well as searching the web based interface for NPS Investigator's Annual Reports. See Appendix 1 for an annotated bibliography of terrestrial projects relevant to GLKN parks. For a detailed summary of fish and aquatic life, see Moraska-Lafrancois and Glase (*In review*).

PARK SUMMARIES

Apostle Islands National Lakeshore

Two central areas of research at the Apostle Islands have been avian and mammalian ecology. A number of studies examined the importance of the Apostle Islands to bird migration across Lake Superior, as well as nesting and reproductive success of piping plover (*Charadrius melodus*), merlin (*Falco columbarius*), and bald eagle (*Haliaeetus leucocephalus*). Annual breeding bird surveys are ongoing for island and wetland bird communities.

Small mammal surveys were conducted in 2003 and 2004. An inventory of bats (*Chiroptera* spp.) in 2003-2004 at Apostle Islands National Lakeshore, Pictured Rock National Lakeshore, and Grand Portage National Monument became the topic for a graduate student's thesis. DNA analysis of American black bear (*Ursus americanus*) hair was undertaken to estimate population size and identify the source of the animals. Studies of beaver (*Castor*

canadensis) were conducted to estimate population size on the islands. Other mammalian research includes a study on the feasibility of monitoring fisher (*Martes pennanti*) and also a study of contaminants in river otter (*Lontra canadensis*). Interactions between animals and plants have been examined in studies of white-tailed deer (*Odocoileus virginianus*) browsing effects on woody plants.

From 1958 - 1984, seven studies of forest ecology were completed. Collectively, these studies document change in the forest species assemblages resulting from both deer and human impacts. A general survey of all vascular flora within the Lakeshore was conducted from 1972 - 1992, with the report documenting distribution and abundance of 810 species. An inventory of rare, threatened, and endangered plant species was completed in 1993 with many species resurveyed in 1996. A study of regeneration of key overstory species was completed in 1986. In 1997, permanent plots were established for long-term monitoring of forests following a history of logging and fire.

The Lakeshore began restoration of degraded sandscapes in 2000 and continues to monitor the success of these efforts. Other inventory or monitoring projects conducted in the park include Lepidoptera of sandscapes, lichens, reptiles, and hemlock (*Tsuga canadensis*) reproduction.

Grand Portage National Monument

Established in 1958 as a cultural park to preserve an area of unique historic value, natural resource management of the Monument received little attention until the 1980s. In 1985, a checklist of vascular plants was completed, and was expanded in 1988 to include specific information on threatened, endangered, and special concern plants in the park. A report detailing invasive plant species within the park was also published in 1985, however, occurrences and distributions have likely changed. Vegetation monitoring plots were established in 1986 to test for differences in forest composition between park land and adjacent tribal land. Although the original intent was to sample every fifth year, sampling was instead conducted in 1992, 1999, and 2004. Analysis of these data is ongoing and a report will be available in late 2004. In addition to forest composition, forest health was addressed in 1987, when the incidence and distribution of white pine (*Pinus strobus*) needle blight in Grand Portage was reported. However, as with data on invasive plant distributions, it is unlikely to reflect the current status of the problem. Research reported in 2003 examined fire scars on older trees within the park to interpret historic fire regimes.

Research on park faunal components was limited until the 1994 when aerial moose (*Alces alces*) surveys began. These were conducted yearly through 1997. A breeding bird survey evolved between 1995 and 2000, and now covers the entire property. Smaller studies have also been conducted in the park. In 2002, the park undertook a study of carabid beetle assemblages in select habitats. As described above, a bat inventory was conducted in 2003, but was not continued in the Monument in 2004 due to logistic and financial constraints.

Indiana Dunes National Lakeshore

The natural history of Indiana Dunes attracted scientists long before the National Lakeshore was established in 1966. Prairie, forest, and lake biomes intersect in the region,

creating unique habitats that support 30% of the state's rare plant species. Strong development pressures in the region have affected these vegetation communities and, in turn, the wildlife that it supports. Between 1985 and 1991, researchers monitored or reported on the status of more than 50 rare plant species within the park. Results of more recent surveys were reported in 1994 and in 2003. Habitat scale studies have examined restoration of oak (*Quercus spp.*) savannas as well as bogs. The former is especially important because these savannas support the native lupine species, *Lupinus perennis*, which is the only food source for larvae of the federally endangered Karner blue butterfly (*Lycaeides melissa samuelis*). Recently, vegetation management has focused on prevention and removal of exotic species, as invasion of these species within the park is widespread and threatens many native habitats.

Mammalian research efforts have focused almost exclusively on deer ecology and management. Deer overabundance is an issue for the Lakeshore, and annual spotlight surveys were conducted throughout the 1990s to monitor abundance. Aerial infrared survey methods were used in 2000 and 2001. Park staff also monitors the impacts of deer on some threatened and endangered plant species and other resources.

Birds have been monitored both from annual Christmas bird counts since 1953, and breeding bird surveys that have been conducted annually, at least since the mid-1990s. There is also an ongoing bird banding effort in the Miller Woods area of the park to inventory species using this area and to assess long-term trends in productivity. Of special interest at the Lakeshore are breeding colonies great blue heron (*Ardae herodias*). A wetland along the eastern portion of the Little Calumet River provides habitat for a rookery of nearly 100 nesting pairs. The status of this rookery is noted annually. Another species of interest at the park is the piping plover, which is federally endangered in the Great Lakes states. Although no pairs are known to breed within the Lakeshore, research from the late 1980s examined the availability and suitability of habitat for the piping plover for possible reintroduction efforts.

In addition to rare flora and avian species, the Lakeshore provides habitat for the rare eastern massasauga rattlesnake (*Sistrurus catenatus cantenatus*). After intensive searching in 2002 and 2003, a single juvenile massasauga was captured. Efforts to locate additional individuals continue. Other studies conducted in the park include surveys of odonates, exotic bark beetles, small mammals, and reptiles, as well as those that examined the effects of air pollution on fungi and foliar injury due to ozone.

Isle Royale National Park

The unique character and isolation of Isle Royale in western Lake Superior has made it of interest to natural history scientists for more than a century. Early vegetation reports from 1904, 1909, 1914, and 1933 are primarily species lists with some emphasis on species - environment relationships. Later studies highlighted the large number of western disjuncts (1935) as well as noted species of special concern (1977); thorough reports of the status of threatened and endangered plants were published in 1984 and 1985. Forest succession on the island has been extensively studied. Between 1913 and 2000, nine studies examined some aspect of succession. An exhaustive species list, compiled from five years of field surveys, was published in 1983 and includes 699 vascular plants. Extensive recent (1994 - 2003) work details human impact on the island's flora, the occurrence of arctic and alpine species, the status of Michigan special concern plants, and the effects of different park management practices. Research during the 1990s also

focused on biogeochemistry, with four studies reporting on nutrient budgets and nitrogen flux. Finally, the effects of moose browse on the island have been extensively studied. From 1988 - 2000, nine studies on moose browse were completed and monitoring continues. The U.S. Geological Survey completed an updated GIS vegetation map in 2000.

Extensive research has detailed aspects of mammalian ecology on the island, especially since the arrival of moose in the early twentieth century and, more so, following the arrival of gray wolves (*Canis lupus*) in the middle twentieth century. An ongoing 40 year study of the population dynamics of moose and wolves details the interactions of these two species and factors influencing their cyclic abundances. These factors include disease, climate, and food supply. This long-term study has spawned many spin off investigations on the ecology of moose, wolves, red fox (*Vulpes fulva*), beaver, and vegetation. Notably, snowshoe hare (*Lepus americanus*)and red fox have been censused annually since the early 1970s and their predator-prey cycle monitored. Beaver have been surveyed approximately every other year since 1990 and their influence on the islands' vegetation has been assessed.

Surveys of bald eagle and osprey (*Pandion haliaetus*) were conducted initially in the 1960s, again in 1985, and annually from 1989 - late 1990s. General raptor inventories were conducted on Isle Royale in 1996, 1997, and again in 2001. Common loon (*Gavia immer*) surveys have been conducted annually since 1990. Since the 1980s, breeding bird surveys have been conducted for the herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*), great blue heron, and double-crested cormorant (*Phalacrocorax auritus*).

Mississippi National River and Recreation Area

This park is a mosaic of fragmented land along 116 km of river corridor. The recreational purpose of this park, coupled with the fragmentation, proximity to development, and river impoundment, places this park at risk for invasions by both floral and faunal exotic species. Further, these same pressures pose a risk for maintaining the diversity of native species. Reports from 1995 and 1996 examine floodplain ecology and how the present floodplain forest differs from that of pre-European settlement times. Restoration of native savanna habitat was completed in 1999. A plant species list was published in 1996 and reviewed for completeness in 2003. Ongoing botanical work encompasses an inventory of both rare and exotic plants.

Urban white-tailed deer surveys are conducted yearly to assess abundance of this nuisance species. The Mississippi River serves as a corridor for native species of migrating and breeding birds, the latter of which are monitored as part of the annual breeding bird survey.

Pictured Rocks National Lakeshore

Three reports from the mid-1970s document 569 vascular plant species occurring in the park, noting their general location and habitats. Also during the 1970s, reports hypothesizing pre-European settlement vegetation were compiled based on soils, faunal communities, and topography. Plant communities of the Grand Sable Dunes were reported in 1978 and delineated into five community types: active dunelands, gravel lags, stabilizing dunelands, pioneer woodlands, and second growth forest. A report from 1981 described 28 western disjunct plant species occurring within the park. Studies on plant species of special concern were initiated in 1984 when the results of surveys for 19 federally listed plants, believed to occur within the park,

were reported. A report from 1988 documented several rare plant species in Grand Sable Dunes, noting percent cover, frequency, and overstory composition. Other rare plant species work at the park has focused on the federally endangered Pitcher's thistle (*Cirsium pitcheri*). Preliminary studies in 1989 and 1992 addressed the natural cycles of disturbance caused by movement of dune sand, comparison of successional stage and environmental changes, and Pitcher's thistle population structure in plots of differing successional stages. Most recent work within the Lakeshore addresses control of exotic plant species. A spotted knapweed (*Centaurea biebersteinii*) action plan was compiled in 1990. Other reports since this date document the presence and/or abundance of purple loosestrife (*Lythrum salicaria*), bishop weed (*Aegopodium podagraria*), vinca vine (*Vinca minor*), giant cow parsnip (*Heracleum mantegazzianum*), baby's breath (*Gypsophila paniculata*), white sweet clover (*Melilotus alba*), garlic mustard (*Alliaria petiolata*), dame's rocket (*Hesperis matronalis*), and multiflora rose (*Rosa multiflora*). A study of the effects of exotic earthworms on forest vegetation and soil was undertaken in 2004, with results expected in 2005.

Studies of mammals at the Lakeshore have ranged widely and cover nearly all major taxa present. Bats were surveyed in the late 1980s along the Beaver Rim Road right-of-way, and are again being surveyed as described above in the Apostle Islands National Lakeshore section. Bears in the Lakeshore, and vicinity, have been extensively researched. Early work in the 1950s detailed population structure, movement, and mortality of tagged black bears. More recent work has documented season and annual home ranges, habitat use, and sources of mortality. In addition to forest carnivores, work has been done on white tailed deer which are overabundant at the Lakeshore. A great deal of research has been directed at both understanding the causes of this and how to manage the populations. The gray wolf is listed as federally threatened in Michigan and individuals and packs that range onto the Lakeshore are being monitored by the park and cooperating agencies. The American marten (*Martes americana*) and fisher are present within the park and their habitat usage, as well as the anthropogenic affects on these habitats, is currently being investigated.

The extent of avian research in the Lakeshore is broad. Raptor surveys were reported in 1996 and 1997 with special emphasis on the northern goshawk (*Accipter gentilis*) and red-shouldered hawk (*Buteo lineatus*). Two surveys of peregrine falcon (*Falco peregrinus*) eyries were completed in the 1970s and an assessment of potential reintroduction sites was reported in 1987. Because piping plover have been observed nesting in the park, reintroduction potential for this species was also examined in the mid 1980s. Other research at the park has focused on yellow-bellied flycatchers (*Empidonax flaviventrix*) and least flycatchers (*Empidonax mimimus*), as well as numerous aquatic species including common loons, mergansers, and gulls. Breeding bird surveys are also conducted regularly throughout the park.

St. Croix National Scenic Riverway

Early biological research on the upper St. Croix River was reported in 1961 with details on fish, river substrate, plants, and water quality. A checklist of park plants was made in 1987, updated in 1996, and revised for both species content and taxonomic status in 2003. Reports from 1987 and 1988 detail plant species assemblages for 54 prairie areas in the park. These reports include data on the three main types of prairies present: basalt glade, hill prairie, and sandy pine barrens. Exotic plant species were first examined in 1985; those species most

threatening the park were identified. The distribution, abundance, and control of exotics were reexamined in 2001 and 2004. Recent park research has addressed species of special concern. Reports from 1991 and 1993 detail surveys within the park for, collectively, 26 rare plant species. Research in 1995 targeted a single threatened species, fame flower (*Talinum rugospermum*). Recent work in the park includes long-term vegetation plot monitoring as well as a landscape ecology project. Ongoing vegetation studies are focused on documenting current distributions and densities of rare species and compiling information for GIS compatible use.

Animal research at the Saint Croix River park is varied, although weighted most toward issues associated with beaver ecology and management. A management plan was drafted in 1990 and baseline monitoring data along the Namekagon River were collected in 1995 and 1996. A deer census was also conducted in the 1990s and aerial deer surveys for the portion of the park in Minnesota are conducted annually. Studies have reported the role of deer as disease transmitters in 1990 (liver flukes) and 1994 (Lyme disease). Other past vertebrate efforts examined the presence of bobcat (*Felis rufus*) and gray wolves and the distribution and status of bats. More recently, in 2004, small mammal surveys were conducted in the northern portion of the park.

The literature detailing avian research at the River is extensive. Periodic surveys and monitoring efforts are conducted and include assessment of bald eagle nesting success, and great blue heron rookery studies. Extensive publications in 1981 detail location summaries for the American white pelican (*Pelecanus erythrorhynchos*), cerulean warbler (*Dendroica cerulea*), hooded warbler (*Wilsonia citrina*), Forster's Tern (*Sterna forsteri*), Bewick's wren (*Thryomanes bewickii*), and many other species of interest. Reports from the late 1980s detail location data for several other birds. Other monitoring efforts focus on Karner blue butterflies and their related habitat.

Sleeping Bear Dunes National Lakeshore

Deer populations on North Manitou Island and their effect on the island vegetation have been the focus of study at the Lakeshore. Heavy browse, which threatened many rare plant species, was coupled with high winter mortality. Because deer are not native to the islands, management has been directed at a complete removal of the species from the two islands. The role of red fox as predators on colonial birds was examined in the past and is detailed in five reports from the 1970s. In recent years, sightings of cougar (*Puma concolor*) have become more numerous. The Lakeshore is attempting to collect hair and scat samples for genetic analysis to determine the source of these animals (i.e., escaped pets versus a naturally expanding population).

Bird monitoring has focused on species of special concern in the past, such as bald eagle, piping plover, and colonial water birds, but is now being expanded to include breeding landbirds. In 2004, the Lakeshore hosted 50% of successful piping plover nests from around the Great Lakes and 60% of the fledged chicks. Because of the importance of Sleeping Bear Dunes to this endangered species, annual monitoring has assumed international importance but is unfunded. A study conducted in 2001-2002 examined the importance of old fields in the Lakeshore to declining grassland bird populations.

The unique plant communities associated with the region's dunes were documented in 1899 and again in 1922. Results of a general survey of North and South Manitou Islands were

published in 1983 and document 490 vascular plant species, with a general survey of the mainland portion of the park published in 1986, documenting 704 vascular plant species. A dune vegetation monitoring program was established in 1996 near North Bar Lake, using permanently placed transects and photo points. Analysis of aerial photographs taken in 1938, 1973, and 1987 of the Sleeping Bear Dunes Complex describes changes in vegetation cover. As with Pictured Rocks National Lakeshore, a focal species of concern at Sleeping Bear Dunes is Pitcher's thistle. Data on its ecology were detailed in a report in 1992. Problem invasive species at Sleeping Bear Dunes are similar to those at Pictured Rocks. Research at Sleeping Bear documents the presence of spotted knapweed, purple loosestrife, and garlic mustard.

Voyageurs National Park

The presence of gray wolves in Voyageurs and their response to human activities has received considerable attention over the years, with studies documenting wolf population size, location, and resource use. Moose and white-tailed deer numbers within the county have been tracked in the past. In the late 1980s, beaver, otter, and muskrat (*Ondatra zibethica*) were studied in relation to how they were impacted by water drawdown. Numerous studies have reported on bear at the Park, and they are nearly all directed at bear-human interactions.

Avian research includes studies published in 1995 and 1996 on the effects of mercury contamination in pisciverous birds, including the bald eagle. A study from 1996 detailed the effect of regulated lake levels on reproductive success of waterfowl. Annual surveys are conducted on breeding birds, bald eagles (since 1986), colonial nesting bird success, and other species of concern.

Studies focusing on the vegetation of Voyageurs National Park are limited, possibly due to both the aquatic nature of this park and its relative isolation. In 1973, a vegetation cover type map for the park was published followed by a vascular plant species list in 1984. The U.S. Geological Survey completed an updated GIS vegetation map in 2001. In the late 1980s, biological effects of air pollution on terrestrial vegetation were examined, with specific work on lichens. A report from 1995 detailed changes in vegetation over a 15 year time period, as a result of both natural succession and disturbance. The park completed a wildland fire management plan in 1989, and continues to monitor the effects of fire on vegetation. A study of the effects of exotic earthworms on forest vegetation and soil was undertaken in 2004, with results expected in 2005. Other recently published accounts and ongoing work focus on noting current extent and future threat of exotics plants, as well as the compilation of species lists that are locationally and taxonomically current.

Literature Cited

Moraska-Lafrancois, B. and J. Glase. In review. Aquatic studies in National Parks of the Upper Midwest Great Lakes states: past efforts and future directions.

Appendix 1

Terrestrial Resource Abstracts

This document contains citations from the NPS database, NatureBib. In order to summarize terrestrial-based research, inventory, and monitoring conducted in GLKN parks, we searched NatureBib using keywords likely to yield the desired results and downloaded the search results. The citations include informal park reports, journal articles, lists, and observer records, and are not restricted to projects conducted within the parks.

No doubt many terrestrial-based projects have occurred in the parks besides those listed in this document. NatureBib is a work in progress, so it's likely that not all park reports have been entered. Additionally, the results of keyword searches depend on how the record was entered. For example, searching on "plant", "vegetation", "forest", "tree", or "hardwood" will not bring up a citation that has "*Acer saccharum*" and "sugar maple" as keywords.

The citations are organized by category (e.g., birds, mammals, vegetation, soils) and alphabetized by author. We have subjected them to minor editing.

Many thanks to Rebecca Stafford and Anne White, both of Northland College, for searching NatureBib, downloading the results, and initiating the organization of thousands of citations. Suzanne Sanders, Mark Hart, and Joan Elias completed the clean-up and organization.

AIR QUALITY

1	Air Resource Specialists, Inc.	1992	Visibility monitoring and data analysis report for Isle Royale National Park, Michigan, 1991 monitoring season, May	ISRO
	Citation found in "Visibility Monitoring and Data Analysis Report for Isle Royale National Park, Michigan: Summary Report for the Summer and Fall 1991 and 1992 Monitoring Seasons" by Air Resource Specialists, Inc., 1995.			
2	Altshuller, A.P., McBean, G.A.	1980	Second report of the United States-Canada Research Consultation Group on the long-range transport of air pollutants	ISRO
	The chapters in this report are: Atmospheric Transport and Deposition Modeling, Air and Precipitation Monitoring, Effect of Atmospheric Deposition, References and Information Sources.			
3	Armentano, T.V., Loucks, Orie L.	1983	Air pollution threats to National Parks of the Great Lakes region; environmental conservation	ISRO, SLBE
	Ten national parks (including Isle Royale National Park), monuments and lakeshores lie in the Great Lakes region of U.S. This paper discusses pollutant sources and air quality in this region, long-range transport and chemical transformation of pollutants, and acidic deposition and their effects on the natural resources of these areas.			
4	author unknown	no date	Appendix B: SO2 concentrations at Hawaii volcanoes, Isle Royale, and Okefenokee National Parks based upon 7-day averaging.	ISRO
	The appendix is a table showing sulfate data for Isle Royale.			
5	author unknown	no date	Briefing paper: Impact on the Indiana Dunes National Lakeshore by the neighboring Bailly Generating Station of the Northern Indiana Public Service Company (NIPSCO)	INDU
	This paper discusses the impact of Northern Indiana Public Service Company's (NIPSCO) Bailly Generating Station on the Indiana Dunes National Lakeshore. An overview of the park and concerns about the ecological effects of the nuclear facility which would be added to the Bailly plant are addressed. Topics for discussion include the impact of the facility on water quality, air quality, and scenic value, and means of environmental protection. A history of the proceedings for the Bailly Nuclear Plant is included, with a description of the scheme by which NIPSCO handles the fly ash which results from the burning of coal at the present generating station. A summary of the correspondence and actions by NIPSCO and park officials is also included, with conclusion statements, recommendations, and questions which would bear on the litigation. The paper includes several photographs, including aerial photos, and maps of the area.			
6	author unknown	1987	Computer printouts of air quality data	ISRO
	The file drawer contains computer printouts of air quality data, one file for each year 1987 through 1995.			
7	author unknown	1992	IMPROVE (Interagency Monitoring of Protected Visual Environments) data 1990-1992	ISRO
	The document presents a variety of air quality measurements done in 1990 and 1991. The objectives of IMPROVE are to establish current background visibility in Class I areas, to identify chemical species and emission sources responsible for existing manmade visibility impairment, and to document long-term trends.			
8	Bennett, James P.	1989	Biological effects of air pollution on terrestrial vegetation in National Park Units in the Great Lakes Basin	GLKN
	A plan for monitoring air quality and vegetation impacts in the Great Lakes region is outlined. Air quality measurements taken at various parks are combined with vegetation impact data to form a regional overview of the effects of air pollution. Different tasks for the study are described, including data analysis and synthesis, biomonitoring, ecological restoration, and sensitivity determinations. A funding summary is also included, with a list of plant species common to seven Great Lakes parks. Almost 2,000 vascular plant species occur within these parks. Thirteen tasks under projects objectives are outlined in this report.			
9	Bennett, James P.	1995	Effects of air pollution on Terrestrial vegetation in National Park units in the Great Lakes Basin, 1990-1995	SACN
	Describes the effects of air pollution on plant communities in Great Lakes National Parks including the St. Croix National Scenic Riverway.			

10	Bennett, James P., Banerjee, Mousumi	1995	Air pollution vulnerability of 22 Midwestern parks; Journal of environmental management	INDU, SACN
	This study of 22 park units in the Midwestern United States attempts to answer the following questions: (1) Can it be determined in advance which parks will be more impacted by these air pollutants than others, (2) Can parks be ranked for vulnerability to air pollutants, and, if so, what variables would be used, and (3) Are air pollutant data sufficient for ranking, or are data also needed on sensitive resources?			
11	Bennett, James P., Esserlieu, Martha K., Olson, R. J.	1985	Ranking wilderness areas for sensitivities and risks to air pollution; IN: GTR INT-212, Forest Service 1986	ISRO
	Wilderness areas may be compared for sensitivity to air pollutants by ranking the sum of the numbers of plant species sensitive to SO2 and O3, and weighted by the relative abundances of each species used in the summation. This ranking can be coupled with actual ambient air quality data for each wilderness area using a geographic information data base to determine the ranking of the wilderness area most at risk to air pollution. Using these procedures, the National Park Service has determined that out of 11 parks for which there is adequate data, Saguaro National Monument, Great Smoky Mountains, Shenandoah, and Rocky Mountain National Parks are experiencing the greatest risk of air pollution damage to vegetation from ozone and sulfur dioxide occurring simultaneously. ISRO ranked among the ten most vulnerable parks in all areas evaluated including vulnerability based on vascular plant sensitivities to sulfur dioxide and ozone; and vulnerability based on lichen sensitivities to sulfur dioxide and vulnerability based on both vascular plant and lichen sensitivities.			
12	Berrang, Paul, Karnosky, D.F., Bennett, James P.	1988	Natural selection for ozone tolerance in *Populus tremuloides* field verification of chamber fumigation data	VOYA
	"Field studies were established in areas with elevated levels of ambient ozone to evaluate differences in relative ozone sensitivity among natural populations of *Populus tremuloides Michx* . from areas that differed in air quality. The relative rankings among populations and among clones within populations agreed closely with rankings derived from acute fumigations with the same plant material, and support the hypothesis that ozone-sensitive clones of this species are being eliminated in some areas of eastern United States." (Abstract by author)			
13	Berrang, Paul, Karnosky, D.F., Bennett, James P.	1991	Natural selection for ozone tolerance in *Populus tremuloides* : an evaluation of nationwide trends; Can J For Res	VOYA
	"Relative ozone sensitivity was evaluated among populations of *Populus tremuloides Michx* . from 15 locations. Seven to 15 clones were selected from each population, greenhouse grown, fumigated with 150 ppb ozone for 6 h, and evaluated for visible injury. Differences among populations were statistically significant. Populations sampled from areas that failed to achieve National Ambient Air Quality Standard for ozone had significantly less injury than populations from areas that achieved this standard. There was a significant negative correlation between the amount of injury and maximum daily ozone averages at localities where the populations were collected. There were also significant correlation between the amount of injury and annual precipitation, and minimum temperature. Differences among clones within populations were highly significant, and was negatively correlated with maximum daily ozone average for the population areas. These findings support our hypothesis that ambient levels of ozone may be eliminating ozone-sensitive clones from natural populations of this species.			
14	Berrang, Paul, Karnosky, D.F., Mickler, R.A., Bennett, James P.	1986	Natural selection for ozone tolerance in *Populus tremuloides* ; Can J For Res	VOYA
	Relative ozone sensitivity was evaluated among populations of *Populus tremuloides Michx.* from each of five national parks differing in air quality. Eleven to 15 clones from each population were greenhouse grown and fumigated twice during 2 years of screening, each time with 180 ppb ozone for 6 hours. The average injury for clones was significantly less for the most polluted park than for the least polluted park and there was a high negative association between average injury and ambient ozone levels. Differences in ozone sensitivity among clones within populations were highly significant and larger than differences among populations. These results suggest natural selection for tolerance in *P. tremuloides* may have occurred in some areas of eastern United States.			
15	Berrang, Paul, Karnosky, David F.	1986	1986 Investigators annual report - a genecological evaluation of air pollution tolerances in hardwood trees in eastern forest parks	ISRO
	Contains tables showing information on ambient ozone levels at Isle Royale National Park and percentages of leaves injured on quaking aspen.			

16	Berrang, Paul, Karnosky, David F., Mickler, R. A., Bennett, James P.	1986	Population changes in eastern hardwoods caused by air pollution; IN: Proceedings of the ninth North American forest biology workshop, June 15-18, 1986, Oklahoma State University and Society of American Foresters, Stillwater, OK	ISRO
	Evolution of ozone tolerance can provide indirect evidence that air pollution is reducing growth of forest trees. Plant material was collected from ten national parks including Isle Royale National Park. *Acer rubrum* (red maple) from natural populations in nine national parks and *Populus tremuloides* (quaking aspen) from natural populations in five national parks were fumigated to determine ozone tolerances. These samples were vegetatively propagated and grown at one location and subjected to experimental ozone fumigation to test for ozone sensitivity. Ozone tolerances of *P. tremuloides* populations from high and intermediate ozone areas were greater than ones from low ozone areas (such as Isle Royale National Park). *A. rubrum* populations from areas with historically high ozone concentrations showed more tolerance than those from low or historically low ozone areas. These results suggest air pollution is reducing the reproductive fitness of some individuals in relatively polluted areas.			
17	Berry, Russell W. Jr.	1980	Acid rain letter	VOYA
	Memorandum from Voyageurs Superintendent to Administrative Law Judge Allan Klein regarding MPCA's proposed legislation which establishes an acid deposition standard and control plan. The park commends MPCA for their efforts but does not feel the proposed actions will fully protect the park's resources. Recommendations on improvement of this proposal are outlined.			
18	Blair, Stephen	1991	Air Quality SOPs - Voyageurs National Park	VOYA
	List of Standard Operating Procedures (SOP) followed for air quality equipment located within Voyageurs National Park. Listing describes equipment used, corresponding SOP, and the number of times the equipment is operated.			
19	Brenan, Louis	1988	Correlation of ozone levels with wind direction	INDU
	A correlation between high ozone levels and wind direction at the Indiana Dunes National Lakeshore is investigated. A list of ozone levels is provided, with fire weather data, and a pollution index of ozone levels.			
20	Cahill, Thomas A.	1992	IMPROVE particulate network - site specific data summaries	VOYA
	This is a collection of the IMPROVE particulate sampler data specific to Voyageurs. These reports provide data on the concentrations of the following: total mass, fine mass, ammonium sulfate, organic mass from carbon, soil, ammonium nitrate, light absorbing carbon, zinc, selenium, lead, and bromine. Much of this data is presented in map form with all sites nationwide represented, and Voyageurs data in particular. IMPROVE samplers were removed from Voyageurs in November of 1996.			
21	Cahill, Thomas A.	1990	Monthly progress reports: IMPROVE/NPS and other particulate network programs	VOYA
	These are the monthly reports on IMPROVE aerosol particulate sampler findings from Park Service units nationwide. Reports contain nationwide averages of gravimetric mass analysis, elemental analysis, ion chromatography nitrate analysis, and optical and combustion carbon analysis. Limited, general data on Voyageurs is sometimes included.			
22	Crocker Nuclear Laboratory - Air Quality Group: University Of California, Davis	1993	Annual Report- aerosol collection and compositional analysis for IMPROVE	VOYA
	This continuing series of reports present aerosol particulate data collected nationwide. Stations at Voyageurs National Park and nearby Boundary Waters Canoe Area are included. Reports contain tables and contour maps depicting the following data: concentrations of total mass and fine mass, ammonium sulfate and organic mass from carbon, fine soil and ammonium nitrate, light absorbing carbon and coefficient of absorption, zinc and selenium, lead and bromine. Annual site specific summaries for each station are also presented, along with overall nationwide summaries and discussions of data validation. The information contained here is a summary of more detailed (month by month) data found in the IMPROVE Site Specific Quarterly Reports. Please see NRBIB record number 200 for further information.			
23	Energy And Resource Consultants, Inc.	1988	Air Quality in the National Parks, a summary of findings from the National Park Service air quality research and monitoring program	INDU
	This report summarizes findings from the National Park Service (NPS) air quality research and monitoring program based on data collected through 1987. Information is presented for various parks throughout the country, including Indiana Dunes National Lakeshore. Information topics include air quality research program responsibilities and activities, visibility, effects of visual air quality on visitor experience, criteria pollutants in NPS units, air pollution effects on biological resources, and NPS participation in protection of air quality resources. Various maps, photos, and data tables supplement report findings.			

24	Esserlieu, Martha K., Olson, Richard J.	1986	Biological vulnerabilities of National Park Service Class I areas to atmospheric pollutants; ORNL/TM-9818	ISRO
	Long-range transport of pollutants such as sulfur dioxide, ozone and acidic deposition potentially threatens many of the National parks. This analysis of the vulnerability of the 48 "Class I" national parks (including Isle Royale National Park), indicates that many of these parks are at risk. Vulnerability was based on predicted responses of each park's vegetation to gaseous pollutants and each park's surface waters to acidic deposition. Risk was determined by comparing vulnerability to estimated levels of sulfur dioxide, ozone, or acidic deposition. 12 of the parks are identified as potentially at risk to impacts from ozone. Vascular plant species are evaluated by their relative sensitivities to sulfur dioxide and ozone, and lichens by their sensitivities to sulfur dioxide; surface water alkalinity was used as a surrogate for acidic deposition sensitivity. Ambient air quality is estimated from nearby station measurements. Isle Royale proved to be one of the more vulnerable parks to pollutants.			
25	Glass, Gary E.	1980	Impacts of air pollutants on wilderness areas along the Minnesota-Ontario border	VOYA
	The goal of this study was to examine previously unanswered questions of potential effects from the proposed Atikokan power plant on the ecosystems in the Boundary Water Canoe Area and Voyageurs National Park using the most relevant data and analytical methods. We focused on : 1) the ultimate deposition of emissions from the plant (rather than only on pollutant concentrations), 2) the use of a time-varying grid model with provision for atmospheric transformations, and 3) a detailed review of all available data from the region on atmospheric deposition of pollutants, water quality, and effects. The study supports, in part, the conclusion reached previously concerning the predicted air concentrations of sulfur dioxide but differs significantly with the conclusions concerning the significance of future impacts. When the total emissions from the proposed power plant are considered will, with high probability, have significant consequences for the sensitive receptors in the BWCA-VNP region.			
26	Glass, Gary E., Sorensen, John A., Liang, L.	1996	Seasonal maximal effects on wet deposition and major ion relationships among methyl-and total mercury in the Upper Midwest; Atmos Environ	VOYA
	Precipitation maximal occurrences in the Upper Midwest in1993 significantly affected total mercury concentrations and deposition as compared with 1990-92, 1994 and 1995. Methylmercury deposition strongly correlated with total mercury, major ions, and precipitation depth. Independent mercury measurement techniques show agreement at 1-35 nh/L total mercury levels in water.			
27	Glass, Gary E., Sorensen, John A., Schmidt, Kent W., Lovdahl, M., Rapp, George R. Jr.	1993	Five-year mercury deposition monitoring database for Minnesota - summary progress report	VOYA
	Mercury contamination of Minnesota resources from atmospheric deposition has been recognized and documented by many researchers. A state-wide monitoring network consisting initially of seven sites was established in 1990 to provide a 5-year database necessary to 1) document precipitation quality for mercury concentrations and loadings, 2) evaluate geographic, temporal, and climatological trends and 3) establish a basis for determining a mercury deposition criterion and standard for the protection of Minnesota Resources. This report summarizes the progress to date for the seven monitoring sites that have been operated continuously for the past three and one half years.			
28	Glass, Gary E., Sorensen, John A., Schmidt, Kent W., Rapp, George R. Jr., Yap, D., Fraser, D.	1991	Mercury deposition and sources for the Upper Great Lakes region; water, air, and soil Pollution	VOYA
	Mercury concentrations and depositions for NE Minnesota were measured in precipitation to investigate depositional trends and possible source emission regions. Environmentally significant amounts of Hg are present in precipitation and air and are subsequently deposited into remote lake watersheds. Volume-weighted concentrations of total Hg in precipitation averaged about 18 ng HgL -1 with calculated annual depositions near 15ug Hg m-2. Hg concentrations in precipitation are positively correlated with the major ions, conductivity, and pH, and are negatively correlated with precipitation volume. From measurements of Hg in rain concentrations as a function of time within events, scavenging ratios for "washable" Hg were calculated to be 140+ 80 (mass based at a 1 mm hr -1 precipitation rate). Up to about 10% of the total Hg in air is subject to washout by precipitation for a given event. Possible source regions within 72-hr travel time were located mostly to the south, southeast, and southwest, up to 2500 km distance away but local sources may also be important.			

29	Gregerman, S.	1979	A subtle threat to a Superior Island; the Great Lakes communicator	ISRO
	A short article describing the early findings of acidic snow and acidic rain at Isle Royale.			
30	Hatch, J. T.	1976	Effects of Presque Isle Power Station on the Ecological Balance of Presque Isle Harbor	ISRO
	no abstract available			
31	Hermanson, Mark H., Hites, Ronald A.	1990	Polychlorinated biphenyls in tree bark; environmental science and technology	ISRO
	Polychlorinated biphenyl (PCB) concentrations in tree bark vary with proximity to a source. Higher total PCB bark/air ratios in areas near contamination show that bark may retain PCB from prior periods of high atmospheric concentrations. Compares PCB in bark samples from locations on Isle Royale (three sites near Windigo) with PCB concentrations at sites near Bloomington, IN. Thirty-one trees were sampled on Isle Royale in September 1987 and three different species were sampled: red maple (*Acer rubrum*), white pine (*Pinus strobus*), and paper birch (*Betula alleghaniensis*). The authors specifically selected trees with few or no lichens growing on the bark to avoid interference with PCB picked up by lichens. An air sampling station was set up at Siskiwit Lake on Isle Royale and the authors calculated ratios of total bark PCB to total air PCB concentration; The ISRO bark/air ratio was 5.7, which can be considered a background value.			
32	Hiebert, Ronald D., Kjellmark, Eric, Leschber, Irina, Mceachern, A. Kathryn	no date	Preliminary investigations of the population biology of white pine in Great Lakes parks: effects of ozone on genetic variation and population structure	INDU
	This study was funded by the Air Quality Division of the National Park Service to gather preliminary and baseline information on the air pollution effects on the biota found within National Park Service areas in the Great Lakes Region. White pine (*Pinus strobus*) was selected as the indicator species that was studied. Permanent monitoring plots were established at five Great Lakes parks, and examined for visible symptoms of ozone damage. Future study recommendations are also made based upon study results. Numerous maps, data tables and figures accompany the text. Slides are included with the raw data.			
33	Huss, Carol	1985	BioIndicators: Plants gauge pollution impacts; sierra north star	VOYA
	Article discussing Kathy Kromroy's bioindicator study which uses plant health to assess air quality conditions. Kromroy's study included plots in Voyageurs National Park. For more detailed information see NRBIB record # 221.			
34	Indiana Dunes National Lakeshore	1978	Preliminary information base: Indiana Dunes National Lakeshore	INDU
	The Preliminary Information Base was created to gather natural and cultural resources and land use information to be used in the completion of an environmental analysis of general management planning alternatives.			
35	Indiana Dunes National Lakeshore	1992	Untitled: Air quality data	No Parks
	Binder contains information from various authors on air quality data measurements from the Indiana Dunes National Lakeshore air quality station, and the Indiana Department of Environmental Management (IDEM). The National Park Service Air Quality Monitoring Station Log is included for 1992 and 1993. IDEM data is provided for 1995 and 1996.			
36	Indiana Dunes National Lakeshore	1996	Untitled: Air quality data	INDU
	Air quality data recorded for areas within or surrounding the Indiana Dunes National Lakeshore is reported. Air quality parameters include ozone, particulate matter 10 microns or less, and occasional reports on lead, metals, carbonyls, and sulfur dioxide. There is also an article on air pollution in Northwest Indiana attached. Binder contains information from various authors.			
37	Isle Royale National Park	no date	Visibility slides	ISRO
	Includes three trays of 35 mm slides taken for visibility documentation from Ishpeming Tower and the Greenstone (Mt. Ojibway?) on Isle Royale National Park from 1979-1986. Tray one includes slides from 1979-1985; tray two, 1985-1986; tray three, 1986 and log book.			
38	Isle Royale National Park	1990	Isle Royale 7-day SO2 data	ISRO
	The eleven pages of data from sulfur dioxide monitoring include: date/time (start/end), meter reading (start/end), elapsed time, flow l/min (start/end), SO4 microg, and SO2 microg/m3.			

39	Joseph, David B.	1997	Attainment of proposed ozone national ambient air quality standards at NPS ozone monitoring sites	VOYA
	On December 13, 1996 the U.S. Environmental Protection Agency proposed major changes to the National Ambient Air Quality Standards (NAAQS) for the air pollutant ozone (Federal Register, 61FR65716). This memo discusses the proposed changed to the standards and presents an analysis of which park units may exceed these standards based on the ozone monitoring data collected from the National Park Service Gaseous Pollutant Monitoring Network.(by author) Information regarding Voyageurs National Park and its potential to exceed these standards in included.			
40	Joseph, David B., Flores, Miguel I.	1993	Statistical summary of ozone measurements in the National Park System, 1981-1991 / volume 1: quick look annual summary statistics reports	VOYA
	This is volume one of two which presents statistical summaries of the ozone data collected at more than 40 units of the National Park Service during the period 1981-1991. Data summaries for Voyageurs National Park are included.			
41	Joseph, David B., Flores, Miguel I.	1993	Statistical summary of ozone measurements in the National Park System, 1981-1991/ volume II: quick look yearly and growing season frequency distribution reports	VOYA
	This is volume two (of two) which presents final, validated gaseous pollutant and meteorological monitoring data collected at various National Park Service units. Data for Voyageurs National Park is contained on pages 234-238.			
42	Johnson Controls World Services Inc.	1994	Ambient air quality data processing, validation, and analysis	VOYA
	This is the continuation of the series of reports by Aerovironment Inc. Each monthly report contains raw data that has only had first level validation and is not intended for public dissemination. The reports contain raw data in the form of tables and graphs on the following parameters: ozone concentrations, scalar wind speed, resultant wind speed, resultant wind direction, temperature, dew point temperature, solar radiation, precipitation, and station temperature. Please see NRBIB record numbers 201 and 202 for information on the rest of this report series.			
43	Koch Refining Company	1996	Environmental assessment worksheet for a Title V air quality operating permit	MISS
	This worksheet is a requirement of the Clean Air Act and state regulations. The refinery wishes to expand operation and thus create more discharge. Contained here are detailed physical and natural site descriptions including, soils, flora and fauna, water use, water quality and emissions, and air quality issues. The report provides tables of raw data and site maps.			
44	Kromroy, Kathryn W., Grigal, David F., Laurence, John A., O'Connell, Katherine M.	1989	A biological system for indexing air quality and assessing effects on vegetation (Minnesota bioindicator study): five year, midterm report – DRAFT	VOYA
	The Minnesota Bioindicator Study is an environmental field research project designed to collect information on air quality in Minnesota by developing ways to directly evaluate the effects of air pollutants on various commercial and noncommercial species of plants. The study has a proposed duration of ten years. This report is compiled after five years of field data collection (1983-1987) and summarizes the major accomplishments, including results of statistical analyses compiled to date, evaluates the system, and reviews the future direction of the project.			
45	Kromroy, Kathryn W., Olson, Melody F., Amundson, G.H., Harrington, S., Grigal, David F.	1991	Minnesota bioindicator study: final report	VOYA
	Volume 1 only (of 4) of the Minnesota Bioindicator study which collected data on the occurrence of air pollutants in the state, using plants as indicators, and evaluated the effects of air pollutants on plant life. Plots in Voyageurs National Park were included in the study, however, this particular volume of the final report is only an overview of the project and an index of tables and appendices found in the other three volumes.			
46	Kromroy, Kathryn W., Olson, Melody F., French, David R.	1987	A biological system for indexing air quality and assessing effects on vegetation (Minnesota bioindicator study) 1987 field report	VOYA
	Progress report for the 1986-1987 field seasons of the Minnesota Bioindicator Project. This project utilizes plants as indicators of air quality and quantifies the effects of air quality degradation on certain plant species. Plots in Voyageurs National Park are included in the data. Please see other references under the title of Minnesota Bioindicator Study.			

47	Krupa, S.V., Kohut, R.J., Laurence, John A.	no date	Air pollution - vegetation effect studies in two National Parks; first National Park Service scientific conference	VOYA, INDU
	The long-term goal of this investigation was to conduct a comparative investigation of the air quality and vegetational effects in a remote and an urban park system. Data was collected from Voyageurs National Park and compared with data collected at Indiana Dunes National Lakeshore. This report briefly summarizes the findings.			
48	Lang, David S.	1983	Establishment of a biological air quality monitoring site in Voyageurs National Park	VOYA
	A services order was issued June 14, 1982 to establish a cooperative funding agreement between the National Park Service and the Minnesota Environmental Quality Board to develop and operate a bioindicator study site in Voyageurs National Park. Three potential sites were evaluated for elevation, slope, and soil criteria. The selected site was cleared of vegetation, and baseline conditions at the site have either been defined or appropriate samples have been collected and stored for future reference. The site has been enclosed and multiple indicator species have been introduced. Future studies at this site are expected to yield unique air quality pollution effects information by direct measurement of environmental impact using a biological assessment system.			
49	Laurence, John A., Schreiber, M.C., Krupa, S.V.	no date	Ambient concentrations of phytopathogenic air pollutants in Voyageurs National Park, Minnesota	VOYA
	Ambient concentrations of ozone (O3), nitrogen oxides (NOx), and sulfur dioxide (SO2) were monitored in Voyageurs National Park, near the U.S. - Canadian border, to determine baseline concentrations of these pollutants. O3 and NOx concentrations were collected using chemiluminescent monitors; SO2 concentrations were recorded using a coulometric monitor. SO2 was not detected. O3 concentrations recorded during 676 hr. of monitoring varied between 14.7 ug/m3 (0.0075 ppm) and 156.8 ug/m3 (0.08 ppm). The latter concentrations occurred once during the summer for 20 minutes. Total nitrogen oxides were monitored for 491 hr. Mean hourly concentrations ranged from 0.32 ppm near 5 AM to 0.397 ppm at 5 PM. Concentrations varied widely from day to day, the minimum concentration observed being 0.0 ppm and the maximum, 0.60 ppm. Pollutant concentrations were not correlated with area weather conditions. These data suggest ozone concentrations observed are not the result of man-related activities or transport from distant urban areas.			
50	Lefohn, A. S., Foley, J. K.	1991	Estimated surface-level ozone exposures in selected class I areas in the United States; Proceedings, 84th Annual meeting, Air & Waste management association, Vancouver, BC, Canada	ISRO
	no abstract available			
51	Mantech Environmental Technology, Inc., U.S. Epa	1996	National performance audit program results - air quality	VOYA
	Results of an audit performed on the ozone monitor at Voyageurs National Park is presented along with EPA acceptable values.			
52	Miller, David F., Chow, Judith C., Fought, Clarence, Ragland, Penny J., Rogers, C. Fred	1988	SO2 measurements in the National Parks	ISRO
	This report details the work performed by the Desert Research Institute in assisting the National Park Service in monitoring sulfur dioxide at nine national parks including Isle Royale National Park, utilizing sample integration methods.			
53	Minnesota Pollution Control Agency	1990	1989 Minnesota pollution control agency precipitation data summary	SACN
	Report summarizes precipitation data collected in 1989, including graphs and tables that describe annual deposition and mean concentrations of sulfate, nitrate, and other ions. Includes data gathered at the Cedar Creek Area and Northwest Audubon Center in the St. Croix Watershed.			
54	Minnesota Pollution Control Agency	1983	Annual precipitation data summaries	VOYA
	This collection of reports varies in format but contains data collected from six stations statewide, including a site in Voyageurs National Park. The collection is incomplete at this time. Years included in the file currently are 1983, 1984, 1987, 1988, and 1989. The data presented in 83-84 depicts monthly pH and volumes of SO4, NO3, Cl, PO4, NH3, Ca, Mg, Na, K, and H for precipitation samples. For the years 87-89, wet and dry deposition samples were collected and analyzed with similar parameters being represented. These reports were eventually replaced with the MPCA Acid Deposition Quarterly Status Reports. (See NRBIB record number 206.)			

55	Minnesota Pollution Control Agency (Division Of Air Quality)	1975	Air Quality Monitoring: International Falls and Surrounding Area	VOYA
	This is a collection of both raw data sheets and summary reports of the air quality monitoring performed at various stations in and around International Falls, MN. Data includes concentrations of suspended particulates, and sulfur dioxides. Notations of exceedances of state standards are included in some of these reports.			
56	Minnesota Pollution Control Agency, Ritchie, Ingrid	1977	Minnesota air quality, 1971-1976	VOYA
	"This report summarizes the quality of the ambient air in Minnesota from 1971-1976. The pollutants which are considered are particulates, sulfur dioxide, nitrogen dioxide, and carbon monoxide." (from author's preface) Includes data gathered in International Falls, prior to establishment of Voyageurs National Park.			
57	Minnesota Pollution Control Agency	1984	Monthly acid rain indexes	VOYA
	This collection of MPCA acid rain indexes provides data on rainfall amounts, pH, index, and classification of samples taken at eight stations statewide including one located in Voyageurs National Park. A key to the classification system used is provided in the report.			
58	Minnesota Pollution Control Agency (Acid Deposition Program)	1986	Quality assurance audits of the Voyageurs National Park ambient air quality monitoring network	VOYA
	This is a collection of air quality audits performed on the Black Bay site in Voyageurs National Park. The reports differ slightly in format but basically all contain performance information on the accuracy of the ozone monitor and meteorological equipment at the site during the audit. In some reports, actual numeric values are presented, while other reports are a narrative summary. All reports make recommendations for improvement where applicable.			
59	Minnesota Pollution Control Agency (Acid Deposition Program)	1990	Minnesota wet sulfate deposition standard: compliance reports	VOYA
	This is a series of reports prepared by the Minnesota Pollution Control Agency containing information related to acid deposition (wet sulfates) in Minnesota. In particular is contains data on exceedances of Minnesota's wet sulfate deposition standards. These reports also present data on SO2 and NOx emission trends, and annual wet sulfate concentrations for thirteen sites statewide, including Voyageurs National Park.			
60	Nater, Edward A., Grigal, David F.	1992	Regional trends in mercury distribution across the Great Lakes states, north central USA; nature	VOYA
	Concentrations of mercury in the environment are increasing as a result of human activities, notably fossil-fuel burning and incineration of municipal wastes. Increasing levels of mercury in aquatic environments and consequently in fish populations are recognized as a public-health problem. Enhanced mercury concentrations in lake sediments relative to pre-industrial values have also been attributed to anthropogenic pollution. It is generally assumed that atmospheric mercury deposition is dominated by global-scale processes, consequently being regionally uniform. Here, to the contrary, we report a significant gradient in concentrations and total amounts of mercury in organic litter and surface mineral soil along a transect of forested sites across the north central United States from northwestern Minnesota to eastern Michigan. This gradient is accompanied by parallel changes in wet sulfate deposition and human activity along the transect, suggesting that the regional variation in mercury content is due to deposition of anthropogenic mercury, most probably in particulate form.			
61	National Park Service	1993	1991 Gaseous pollutant annual summary	VOYA
	Includes five sheets of microfiche containing tables, graphs, and charts of the gaseous pollutant results for samples taken in Voyageurs National Park in 1991.			
62	National Park Service - Air Quality Division	1979	Status of present air quality monitoring in the National Parks and projected needs through fy '84	VOYA
	This document reports the present status of the air quality monitoring projects in the National Parks and lists projected needs through the fiscal year 1984. Information is very brief and lists each park separately. Voyageurs National Park is included.			

63	National Park Service - Air Quality Division	1986	Milkweed survey III, air quality division, National Park Service	PIRO
	Data concerning damage to milkweed (*Asclepias*) leaves caused by ozone were collected on August 25, 1986, on the Grand Sable Dunes and along Carmody Road at Pictured Rocks National Lakeshore, MI. Data on height, number of leaves, number of leaves injured by ozone concentrations, and number of seed pods was recorded for each of 20 milkweed plants. Soil moisture was also noted.			
64	National Park Service - Air Quality Division	1989	1989-1993 Gaseous pollutant and meteorological monitoring annual data summary	INDU
	These reports present the final, validated gaseous pollutant and meteorological monitoring data collected at the Indiana Dunes National Lakeshore. The reports contain data summaries organized into three major sections: annual, calendar quarter, and month. Figures and data tables illustrate air quality and meteorological statistics and data measurements for each year.			
65	National Park Service - Air Quality Division	1989	Gaseous pollutant and meteorological monitoring - annual data summary: Voyageurs National Park	VOYA
	This is a continuing series of reports published annually by the Denver Service Center. They contain yearly summaries and data tables of ambient air quality samples and meteorological information collected in Voyageurs National Park. Report summaries divide each year's data into four quarters (three months each) and contain, in abbreviated, summary form, the same information found in the "Ambient Air Quality Data Processing, Validation, and Analysis Reports" (Natural Resources Files N3615 or NRBIB record numbers. Main parameters include: ozone concentrations, (including NAAQS exceedances), wind speed and direction, solar radiation, dew point, temperature, and precipitation. Currently, reports for years 1989- 1993 are in this file.			
66	National Park Service, Air Quality Division	1990	Isle Royale National Park-visibility and air quality data summary	ISRO
	A plot of seasonal visual ranges at Isle Royale indicates that the greatest visibilities were recorded during the summer and fall seasons; visibility was lowest in the winter of 1989. This seasonal trend is opposite to most areas in the East and West where summertime is typically associated with lower visibilities. The highest seasonal concentrations of fine mass and fine sulfate at Isle Royale have occurred during spring. At Isle Royale, the visual range is lowest in the spring season, which is consistent with the season's higher fine mass and sulfate concentrations. The park is considered an attainment area for the sulfur dioxide NAAQS and the ozone NAAQS.			
67	National Park Service - Air Quality Division	1990	Voyageurs National Park visibility and air quality data summary	VOYA
	This is a narrative report that summarizes air quality and visibility data collected at Voyageurs National Park. It discusses standard visual ranges, particle data, gaseous pollutants, and meteorological data gathered in the park since 1986. A table outlines the history of air quality monitoring in the park, specifically listing what types of instruments were installed at the various dates outlined.			
68	National Park Service, Air Quality Division	1992	Isle Royale National Park: 1989 gaseous pollutant and meteorological monitoring annual data summary; technical report NPS/NRAQD/NRTR-92/22	ISRO
	The purpose of this report is to present the final, validated gaseous pollutant and meteorological monitoring data collected at Isle Royale National Park. The primary objective of this monitoring program is to establish baseline or current park air quality conditions to determine if a park is exceeding the National Ambient Air Quality Standards established by the Environmental Protection Agency to protect public health and welfare. This report contains Annual Data Summaries, Quarterly Data Summaries, and Monthly Data Summaries.			
69	National Park Service, Air Quality Division	1992	Isle Royale National Park: 1990 gaseous pollutant and meteorological monitoring annual data summary; technical report NPS/NRAQD/NRTR-92/23	ISRO
	The purpose of this report is to present the final, validated gaseous pollutant and meteorological monitoring data collected at Isle Royale National Park. The primary objective of this monitoring program is to establish baseline or current park air quality conditions to determine if a park is exceeding the National Ambient Air Quality Standards established by the Environmental Protection Agency to protect public health and welfare. This report contains Annual Data Summaries, Quarterly Data Summaries, and Monthly Data Summaries.			

70	National Park Service, Air Quality Division	1992	Isle Royale National Park: 1991 gaseous pollutant and meteorological monitoring annual data summary; technical report NPS/NRAQD/NRTR-92/67	ISRO
	The purpose of this report is to present the final, validated gaseous pollutant and meteorological monitoring data collected at Isle Royale National Park. The primary objective of this monitoring program is to establish baseline or current park air quality conditions to determine if a park is exceeding the National Ambient Air Quality Standards established by the Environmental Protection Agency to protect public health and welfare. This report contains Annual Data Summaries, Quarterly Data Summaries, and Monthly Data Summaries.			
71	National Park Service, Air Quality Division	1994	Isle Royale National Park: 1992 gaseous pollutant and meteorological monitoring annual data summary; technical report NPS/NRAQD/NRTR-94/139	ISRO
	The purpose of this report is to present the final, validated gaseous pollutant and meteorological monitoring data collected at Isle Royale National Park. The primary objective of this monitoring program is to establish baseline or current park air quality conditions to determine if a park is exceeding the National Ambient Air Quality Standards established by the Environmental Protection Agency to protect public health and welfare. This report contains Annual Data Summaries, Quarterly Data Summaries, and Monthly Data Summaries.			
72	National Park Service, Air Quality Division	1995	Isle Royale National Park: 1993 gaseous pollutant and meteorological monitoring annual data summary; technical report NPS/NRAQD/NRTR-95/194	ISRO
	The purpose of this report is to present the final, validated gaseous pollutant and meteorological monitoring data collected at Isle Royale National Park. The primary objective of this monitoring program is to establish baseline or current park air quality conditions to determine if a park is exceeding the National Ambient Air Quality Standards established by the Environmental Protection Agency to protect public health and welfare. This report contains Annual Data Summaries, Quarterly Data Summaries, and Monthly Data Summaries.			
73	National Park Service, Ogden Environmental and Energy Services, Aerovironment Inc.	no date	Air quality monitoring site audits	VOYA
	This is a haphazard collection of audits performed on Voyageurs National Park air quality monitoring equipment. Some audits were performed by NPS staff and others were prepared by contracted parties (Ogden and Aerovironment). Audits contain information on the accuracy of equipment readings and recommend maintenance needs or procedural changes to correct the discrepancies found.			
74	Nelson-Jameson, Barbara, Rutkowski, D., Stottlemyer, Robert R.	1986	Assessing anthropogenic atmospheric deposition effects in National Parks of the Great Lakes basin	GLKN
	Seven national parks, including Voyageurs National Park, were assessed for atmospheric deposition effects. Soil characteristics and precipitation pH is discussed. This is a short summary only - actual document has not been located. Some information on Voyageurs NP is included.			
75	Nelson-Jameson, Barbara, Stottlemyer, Robert	1985	Assessing the effects of anthropogenic atmospheric deposition on the national parks in the Great Lakes region; IN: proceedings of the seventh research conference, Apostle Islands National Lakeshore, October 18, 1985, p 10-12	GLKN
	no abstract available			
76	Ogden Environmental and Energy Services	1992	Audits: air quality and meteorological instruments, Voyageurs National Park	VOYA
	This is a collection of performance audits conducted by a contractor (Ogden Environmental: Aerovironment) on the air quality and meteorological equipment being utilized at Voyageurs National Park. These appear to be the actual audits and contain handwritten notes highlighting instrument readings that were out of specifications.			
77	Raeymaekers, Geert	1985	The effect of wet and dry fallout and the assessment of criteria to use bryophytes as monitors of acid rain on Isle Royale National Park annual report to NPS air quality division	ISRO
	no abstract available			

78	Sisler, J. F., Huffman, D., Latimer, D. A., Malm, W. C., Pitchford, M. L.	1993	Spatial and temporal patterns and the chemical composition of the haze in the United States: An analysis of data from the IMPROVE network, 1988-1991	ISRO
	no abstract available			
79	Sorensen, John A., Glass, Gary E.	1989	Progress report for the LCMR mercury project II for the quarter ending December 31, 1989	VOYA
	This report is actually in the form of a memorandum to Marvin Hora of the Minnesota Pollution Control Agency. The report contains precipitation collection and mercury analysis data for samples taken at a variety of stations (including one in International Falls) for the quarter ending December 31, 1989. It also discusses field and analytical procedures used and provides an outlines of the work remaining to be completed. There is also a work plan for a study of mercury in the St. Louis River, Mississippi River, and Crane Lake and Sand Point Lakes in Voyageurs National Park.			
80	Sorensen, John A., Glass, Gary E., Schmidt, Kent W.	1994	Regional patterns of wet mercury deposition; environmental science and technology	VOYA
	Most of the mercury contamination in lakes and streams of non-industrialized regions of the United States and Canada is derived from atmospheric deposition. In order to determine the regional patterns of these inputs, seven mercury-in-precipitation monitoring sites were established in Minnesota, North Dakota, and Michigan. A 3-year study showed that the magnitude of mercury deposition was dominated by the quantity of precipitation. Regional variations of mercury concentrations in precipitation were mostly explained by precipitation rate with higher concentrations occurring in the summer. Statewide, (Minnesota) annual mercury emissions estimates exceeded depositions for 1990, 1991, and 1992 by a factor of approximately 2 and indicated long-range transport of mercury. Significant correlations were observed between concentrations of mercury and other ions in precipitation. (Abstract by Author)			
81	Stottlemyer, J. Robert	1982	Ecosystem evaluation of anthropogenic atmospheric inputs (abstract); IN: symposium on external threats to ecosystems in the National Parks American Association for the advancement of science annual meeting, January 3-8, 1982, Washington, DC	GLKN
	no abstract available			
82	Stottlemyer, Robert	1982	Assessing anthropogenic atmospheric deposition effects in national parks of the Great Lakes region GLARSU technical report #4 submitted to chief scientist, Midwest region, National Park Service, Omaha, NE	GLKN
	no abstract available			
83	Stottlemyer, Robert	1984	Assessing the impacts of atmospheric contaminants in terrestrial and aquatic environments on Isle Royale; Isle Royale newsletter "Insider"	ISRO
	no abstract available			
84	Stottlemyer, Robert R.	1985	Assessing effects of a gradient of anthropic atmospheric inputs in National Parks and biosphere reserves within similar ecosystems	GLKN
	National Reserves within the Great Lakes Basin are being subjected to perhaps the most pronounced gradient of anthropic atmospheric inputs found in the United States. West to east there is a sharp increase in deposition of hydrogen, sulfate, nitrogen species, heavy and trace metals, and exposure to ozone, sulfur dioxide, and possibly pesticides. The array of inputs makes it most difficult to separate man-caused effects from natural sources of ecosystem perturbation. We have gauged a series of ecologically similar small first-order watersheds, dominated by late successional *Acer saccharum* , across this gradient. Initially we are emphasizing time-trend analyses of major ion and heavy metal input/outputs, heavy and trace metal concentrations and decomposition in forest litter, and soluble and adsorbed sulfate in forest soils. Input gradients allow the conduct of time-trend analyses on these sites to determine how relatively undisturbed but otherwise similar ecosystems might respond to present or enhanced anthropic inputs should such continue in the future.			

85	Stoeckenius, Till E., Shepard, Stella B., Iwamiya, Robert K.	1995	Analysis of dry deposition monitoring data in Minnesota and surrounding areas	VOYA
	This report was prepared for the Minnesota Pollution Control Agency, and contains a comparison for dry deposition data from 13 sites in Minnesota between 1984 and 1993 and similar data collected in northeastern Minnesota, Ontario, and Wisconsin by three other organizations. The analyses were designed to yield information needed to 1) evaluate the accuracy and precision of measurements, 2) identify the major features of the ambient data including means, relationships between sites and species, and sources of variability, 3) compare MPCA monitoring methods and results with those of similar networks with stations in and around Minnesota, and 4) guide future analyses by identifying areas for further investigation. At site at Voyageurs National Park is included in this comparative study.			
86	Teng, Paul S., Kromroy, Kathryn W.	1986	A biological system for indexing air quality and assessing vegetation effects (Minnesota bioindicator study) : Voyageurs National Park plot, 1984	VOYA
	"This report is a compilation of the biological data collected during the 1984 field season at the plot located within Voyageurs National Park. In addition to the 1984 raw data, a brief summary of the occurrence of pollutant injury at the Voyageurs Plot over the past three years and a statement regarding the current state of the project are presented." (Excerpts from author introduction)			
87	Thorvig, Lisa J.	1992	Air emission permit no 1001A-92-OT-1 for a wood-frame manufacturing facility and air pollution control equipment	VOYA
	This document is a draft copy of the air emissions permit issued by the Minnesota Pollution Control Agency for the Marvin Windows and Doors facility located in Warroad, Minnesota, approximately 160 km northwest of Voyageurs National Park. It authorizes modification and operation of the stationary source and air pollution control equipment under a specific set of conditions. This document provides in extensive detail the modifications and equipment concerned and outlines the specific emissions allowable. Also provides data that supports the conclusion that the authorized emissions will not have the potential to affect visibility in Voyageurs National Park.			
88	University Of Minnesota-Duluth: Archaeometry Laboratory	no date	Precipitation monitoring progress reports for Voyageurs National Park	VOYA
	Collection of informal summary reports concerning mercury contamination levels in precipitation collected in Voyageurs National Park.			
89	Voyageurs National Park	1984	Air and water quality monitoring projects in Voyageurs National Park	VOYA
	In-house document summarizing what air and water quality projects are (and were) being conducted at the Black Bay monitoring site.			
90	Voyageurs National Park	no date	Winter 1986 particulate report for Voyageurs National Park	VOYA
	The NPS Particulate Monitoring Network is determining the causes of visibility reduction at selected national parks, including Voyageurs NP by measuring the concentration of airborne particles. Measurements are being made continuously at 30 sites nationwide using a sampler that separates the particles into coarse and fine fractions. Each sample is collected for 3 days, with 12 hours between samples to change filters. Each coarse and fine sample is analyzed for the concentrations of elements heavier than oxygen by the x-ray analysis and the total concentration of all particles by weighing. Coarse particles consist mostly of soil-related elements, silicon, aluminum, potassium, calcium, iron, and titanium. Sulfur is the most important fine element, being considered the largest single cause of visibility reduction. Average concentrations during the winter 1986, for both the coarse and fine elements are presented for all 30 NPS sites.. All data specifically pertaining to Voyageurs NP samplers is also included.			
91	Voyageurs National Park	1986	Spring 1986 particulate report for Voyageurs National Park	VOYA
	The NPS Particulate Monitoring Network is determining the causes of visibility reduction at selected national parks, including Voyageurs NP, by measuring the concentration of airborne particles. Measurements are being made continuously at 30 sites nationwide, using a sampler that separates the particles into coarse and fine fractions. Each sample is collected for 3 days, with 12 hours between samples to change filters. Each coarse and fine sample is analyzed for the concentrations of elements heavier than oxygen by x-ray analysis and the total concentrations of all particles by weighing. The fine samples were also analyzed for hydrogen concentration and the coefficient of optical absorption. Coarse particles consist mainly of soil-related elements, silicon, aluminum, potassium, calcium, iron, and titanium. Sulfur is the most important fine element, being considered the largest single cause of visibility reduction. Average concentrations for both coarse and fine samples for all 30 NPS sites during spring 1986 are reported. All pertinent data for Voyageurs National Park is also included.			

92	Weber, Neil V., Brunansky, Louis	1981	Climatology and air quality of the Indiana Dunes National Lakeshore; IN: basic ecosystem studies of the Indiana Dunes National Lakeshore	INDU
	This chapter on climatology and air quality of the Indiana Dunes National Lakeshore presents both the area's climatology and its climatic anomalies. Air quality for the lakeshore is described in detail including the air resource monitoring program, national ambient air quality standards, non-attainment areas, National Park Service air resources management policy, and specific air pollution influences on the lakeshore. An air quality data base retrieval system is analyzed. Various maps and data tables accompany the text.			
93	Wood, Francis A.	1975	The role of disease in environmental and ecological management of National Parks	INDU
	This report contains a literature survey on the major plant pathogenic air pollutants pertinent to the Indiana Dunes National Lakeshore, and their effects on vegetation. A preliminary compilation of the bibliography on diseases of aquatic plants is included. A general background on air pollutants is provided, followed by sections on the effects of ozone on plants, effects of sulfur dioxide on vegetation, acidic rain and acid aerosols, and effects of fluorides on vegetation. There is also a preliminary literature compilation on the diseases and disorders of aquatic vegetation. Various charts, maps, graphs and photos accompany the text. An appendix discusses the procedure for foliar chemical analyses.			
94	Wood, Francis A.	1976	The role of disease in environmental and ecological management of National Parks -volume 1	VOYA
	This report provides the final reports of studies done by the Minnesota Cooperative Park Service Unit. All the studies involve some area of Voyageurs National Park or a surrounding county. The research areas discussed in this volume are as follows: 1) Impact of Air Pollutants on Plant Species Commonly Found in Parks, 2) Establishment of Baseline Levels of air Pollutants in Remote and Urban Areas, 3) An Evaluation of the Pollution of Rainfall with Emphasis on Acidity, and 4) A Survey of Diseases of Aquatic Plants and an Evaluation of the Impact of Such Diseases on Aquatic Plant Populations. This volume is one part of a series of reports on these subjects.			
95	Wood, Francis A.	1976	The role of disease in environmental and ecological management of National Parks -volume 2	INDU, VOYA
	This report provides the final reports of studies done by the Minnesota Cooperative Park Service Unit. All the studies originally involved some area of Voyageurs National Park or a surrounding county. A shift in administrative policies and NPS needs occurred during 1975-76 resulting in a de-emphasis of the following research areas #1 - Ecology of dwarf mistletoe, #5 - The role of virus and mycoplasma-like organisms in wild areas, #6 - survey if diseases of aquatic plants, #7 - Development of a system for determining the nature and importance of various diseases in national parks. Studies remaining concentrated on air pollutants and their impact on park vegetation. A two year study was conducted at Voyageurs National Park during the summers of 1974 and 1975 to collect background information prior to the development and use of the park. In 1976, this study was shifted to Indiana Dunes National Lakeshore. This volume contains the details of the air pollution-vegetation effects. This volume is part of a series of reports on these subjects.			

BIRDS

1	Adams, Charles C.	1908	The ecological succession of birds; The Auk	ISRO
	no abstract available			
2	Adams, Charles C.	1909	An ecological survey of Isle Royale, Lake Superior; Wynkoop Hallenbeck Crawford Co (state publisher), Lansing, Michigan	ISRO
	no abstract available			
3	Adams, Charles C.	1909	The ecological succession of birds; an ecological survey of Isle Royale, Lake Superior	ISRO
	Describes societies of birds as they are found in different ecological associations and habitats on Isle Royale.			
4	Aldous, Shaler E.	1944	Field notes on Isle Royale National Park, September 6-18, 1944	ISRO
	no abstract available			
5	Anonymous	no date	Summary of bird population studies in Benzie County, Michigan by habitat	SLBE
	A description of the bird populations by habitat in Benzie County, Michigan from about 1966 to 1973 (the years vary for each habitat description). The habitats described are open sand dunes; open moist meadow; oak-pine forests; boreal forest; northern hardwoods; swamp habitat; and, stream habitat. For each habitat, the following are discussed: the years studied, a description of the habitat, numbers of species recorded, noticeable population trends for some species, and overall population trends.			
6	Apfelbaum, Steven I., Heiman, Karin A., Prokes, John, Tiller, David, Ludwig, James P.	1983	Ecological condition & management opportunity for the Cowles Bog & western Great Marsh, Indiana Dunes National Lakeshore, Porter, Indiana	INDU
	Baseline ecological data was collected for Cowles Bog and Great Marsh in 1982. Ecological conditions and vegetation dynamics were studied to aid in designing management recommendations for the complex of wetlands. Soils and vegetation were identified, and small mammal, bird, and water quality studies were conducted, as well. Aerial photographs are included in the report.			
7	Arzarian, Kenneth	1991	The birds of the Indiana Dunes National Lakeshore: 1991 revision	INDU
	The bird list for Indiana Dunes National Lakeshore contains the general abundance per season for each species found at the park. General habitat preferences are also listed where known. The checklist was reviewed by Kenneth Brock, author of "Birds of Indiana Dunes" prior to publication.			
8	Aus, P. B., Krefting, Laurits W.	1961	Observations on the birds of Isle Royale, July 17-21, 1961	ISRO
	no abstract available			
9	author unknown	1953	Chicago Audubon Society Indiana Dunes National Lakeshore Christmas bird count	INDU
	This document includes a compilation of species lists and summary of bird counts from 1953-1992 for the Indiana Dunes National Lakeshore. For each species, the number observed during each Christmas bird count is indicated. Dates include 1953, 1963-1964, 1972, 1977, 1979, 1982, and 1983-1992.			
10	author unknown	1983	Indiana Dunes - CAS breeding bird study	INDU
	This group of data sheets consists of raw data from breeding bird surveys in the National Lakeshore area. Data on numbers of birds seen or heard for each area is given.			
11	author unknown	1989	Great blue heron action plan	INDU
	This plan gives a brief history and description of the great blue heron (*Ardea herodias*) before addressing its status at the Indiana Dunes National Lakeshore. Management of the herons, up to the writing of the plan is discussed, and recommendations for their future management are made.			

12	Bagby, Susan, Grundel, Ralph	1993	Untitled: breeding bird survey results 1993-1996	INDU
	This document consists of a compilation of data sheets for breeding bird surveys at the Indiana Dunes National Lakeshore from 1993 through 1996. Data sheets indicate species and number of birds seen along specified routes. Maps, correspondence, and survey protocols are also included in the files.			
13	Barclay, John H.	1980	Release of captive-produced peregrine falcons in the eastern United States, 1975-1979	ISRO
	Reports on the hacking of 204 captive-produced peregrine falcons (*Falco peregrinus*) released in the eastern United States in 1975-1979. Describes survival success, mortality, and reproductive success. The literature review describes taxonomy and distribution, general habits, peregrine falcon populations and population declines. Hacking methods are described and results are presented, including hacking results, recoveries of hacked peregrines, return of hacked peregrines to release sites, subspecies of released peregrines and population considerations.			
14	Barriball, Thomas R.	1979	An environmental assessment of the heron rookery: Indiana Dunes National Lakeshore	INDU
	The report briefly examines the status of the great blue heron population nesting at the heron rookery in the Lakeshore. General management possibilities are also given.			
15	Bassett, C. Audra, Flaspohler, David F.	2002	Forest songbirds on the Manitou Islands of Sleeping Bear Dunes National Lakeshore: preliminary results. Abstract in Western Great Lakes Research Conference	SLBE
	Populations of forest songbirds were sampled on North and South Manitou Islands of Lake Michigan, part of Sleeping Bear Dunes National Lakeshore, MI to compare bird community composition, species abundance, and relationship to differences in vegetation and presence of white-tailed deer. Bird populations were sampled using mist nets and auditory point counts. Differences in species presence and abundance between islands were noted. Vegetation analysis is underway. Study will continue in 2002 and 2003.			
16	Beals, Edward	1958	Notes on the summer birds of the Apostle Islands; The Passenger Pigeon	APIS
	A list of bird observations was given for the summers of 1957 and 1958 on the Apostle Islands.			
14	Beals, Edward	1960	Forest bird communities in the Apostle Islands of Wisconsin; The Wilson Bulletin	APIS
	This paper describes the bird populations within the forests of the Apostle Islands in terms of community gradient, relating these bird communities to their environmental framework. A rapid sample count method were used to census the birds in this study. For each species, frequency and density were recorded for all the stands sampled. Sixty species were recorded. There are two ubiquitous birds, the red-eyed vireo and the ovenbird. The black-throated green warbler and American redstart also show high presence. On the other hand, 15 species were found in only one stand each. The highest stand abundance values are achieved by the ovenbird and black-throated green warbler; among other widespread species the hairy woodpecker, the American redstart, and solitary vireo show low stand abundance. Birds reaching highest audiovisual densities in any stand are the black-throated green warbler, ovenbird, red-eyed vireo, white-throated sparrow, and least flycatcher.			
18	Beals, Edward	1967	Notes on the summer birds of Apostle Islands II; The Passenger Pigeon	APIS
	Observations of peregrine falcons, olive-sided flycatcher, gray jay, boreal chickadee, brown creeper, Brewers blackbirds, red crossbill, and savannah sparrow were noted.			
19	Bechthold, James L.	1971	Significance of various ecological factors on waterfowl populations in western Wisconsin, 1968 and 1969	SACN
	Thesis provides insights into influences on waterfowl production in the western part of the state. Provides population estimates and species involved in the study.			
20	Beebe, R.	1933	Influence of the Great Lakes on the migration of birds; The Wilson Bulletin	PIRO
	no abstract available			

21	Beeman, Jennifer L., Oelfke, Jack G.	1996	1996 Raptor inventory at Isle Royale National Park, Michigan Isle Royale National Park Resource Management Report 96-2	ISRO
	Efforts to monitor the locations and productivity of bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) nests in Isle Royale National Park were continued in 1996. A preliminary overflight was conducted to identify active nest sites, followed up with three flights to determine reproductive success at each of the nests. Nests were located and young were produced for both species. Less intensive monitoring of other raptors consisted of maintaining sight records; One observation of peregrine falcon (*Falco peregrinus*) was reported. Recommendations for 1997 are discussed and include the complete integration of the "location-number" identification system proposed in 1994.			
22	Beeman, Jennifer L., Oelfke, Jack G.	1996	1996 Breeding bird survey at Isle Royale National Park, Michigan Isle Royale National Park resource management report 96-3	ISRO
	Isle Royale National Park established a formal breeding bird survey in 1994 to integrate island population data with other studies being conducted in the region. This program continues with the objective of determining the size and composition of the neotropical migrant community on Isle Royale. Point counts were conducted using eight park trails as transects. Species diversity values were calculated for each point and then averaged for each transects. Fifty-eight species were recorded; five species were present in all eight transects while 13 species were recorded at only one transect. Comparisons between 1996 and 1995 are discussed. Vegetation sampling at each census point was done in 1996 to allow future analysis to associate population trends with habitat characteristics.			
23	Beeman, Jennifer L., Oelfke, Jack G.	1997	1997 Raptor inventory at Isle Royale National Park, Michigan Isle Royale National Park resource management report 97-2	ISRO
	Efforts to monitor the locations and productivity of bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) nests in Isle Royale National Park were continued in 1997 and this report provides details on raptor activity and nesting success during the 1997 breeding season. A preliminary overflight was conducted in May to identify active nest sites, and this was followed up with two more flights in July and August to determine reproductive success at each of the nests. Less intensive monitoring of other raptors consisted of maintaining sight records. A total of 14 occupied nests were located during the May over flight. Nine occupied bald eagle nests produced young. Five occupied osprey nests produced young. Other raptor observations included reports of peregrine falcon (*Falco peregrinus*). Completed raw data forms and a computer database pertaining to this survey can be found in the ISRO Natural Resource Specialist office.			
24	Beeman, Jennifer L., Oelfke, Jack G.	1997	1997 Breeding bird survey at Isle Royale National Park, Michigan Isle Royale National Park resource management report 97-3	ISRO
	Isle Royale National Park established a formal breeding bird survey in 1994 to integrate island population data with other studies being conducted in the region. This program continued in 1995, 1996, and 1997 with the objective of determining the size and composition of the neotropical migrant community on Isle Royale. This single objective approach represents a shift in focus from the 1994 survey. Point counts were conducted using eight park trails as transects. Species diversity values were calculated for each transect. A total of 58 species were recorded across the island. Completed raw data forms and a computer database pertaining to this survey are on file at the ISRO Natural Resource Specialist office.			
25	Beeman, Jennifer L., Oelfke, Jack G.	1997	1997 Common loon survey, Isle Royale National Park, Michigan Isle Royale National Park resource management report 97-4	ISRO
	The annual common loon (*Gavia immer*) monitoring program at Isle Royale National Park was completed in 1997 to maintain continuous data on the size and productivity of the island's unique loon population. Forty-seven of the island's interior lakes and 27 locations along the Lake Superior shoreline were surveyed. The presence of adult and/or juvenile loons was recorded; productivity was calculated. Reproductive output in 1996 and 1997 was lower than in previous years. Completed raw data survey forms and a computer database relating to this survey can be found in the ISRO Natural Resource Specialist office.			
26	Beer, James R., Dahlberg, Thomas H.	1965	Notes on the winter birds of the Apostle Islands; The Passenger Pigeon	APIS
	During the winters of 1954 through 1960 several days were spent on Stockton Island searching for signs of marten which had been planted on the islands. A list of birds observed during these surveys is included. Only 15 species of birds were observed during these surveys, in contrast to 102 species seen during the summer by Beals.			

27	Belwin Outdoor Education Laboratory	1990	Belwin Laboratory ongoing monitoring and research efforts	SACN
	A variety of research and monitoring studies have used the Belwin Lab in the past, including vegetation inventories, prairie restoration projects, bird inventories, wild turkey reintroductions, goose studies, and monitoring of rare and endangered species. Reports and data are available in the Belwin files, but have not been catalogued.			
28	Bergland, Mark S.	1982	Spring wood warbler migration patterns in Pierce and St. Croix Counties, Wisconsin	SACN
	This survey provides migration tendencies for the wood warbler during the spring. Abundance and distribution are studied in these two counties that boarder the St. Croix River.			
29	Berglund, Mark S., Kerry, Clarke E.	1981	Foraging behavior of red-winged blackbirds breeding in the Lake Helen waterfowl production area, St. Croix County, Wisconsin	SACN
	Behavior of this common riverway bird is explored during its breeding period. Differences in foraging between time periods are discussed.			
30	Berglund, Mark S., Garry, Clarke E.	1984	Influences of male parental behavior on reproductive success of yellowheaded blackbirds breeding in St. Croix County, Wisconsin	SACN
	The study focuses on one aspect of breeding success for the bird species. St. Croix County boarders the St. Croix River.			
31	Blokpoel, H., Scharf, William C.	1990	The ring-billed gull in the Great Lakes of North America	ISRO
	no abstract available			
32	Blokpoel, H., Scharf, William C.	1991	Status and conservation of seabirds nesting in the Great Lakes of North America; International Council for the Preservation of Birds technical publication Number 11	ISRO
	no abstract available			
33	Bonestroo Rosene Anderlik & Associates	1997	West draw study area alternative urban area wide review (AUAR)	MISS
	The AUAR was prepared in lieu of an Environmental Assessment Worksheet (EAW) or an Environmental Impact Statement (EIS) for an area in Coon Rapids, MN slated for development. The area lies near, but not within the Mississippi National River and Recreation Area.			
34	Bowerman, William W. IV	1990	1990 Investigators annual report - bald eagle contaminant study	ISRO
	Contains a results table showing the results of toxicology tests for organochlorine concentrations completed on blood drawn from a nestling bald eagle at Isle Royale National Park.			
35	Bowerman, William W., IV, Christiansen, Stacy R., Robinson, William L., Kenner, Brian C.	1997	Woodland raptor survey of Pictured Rocks NL and Hiawatha National Forest. Abstract in Lake Superior National Parks research conference	PIRO
	The ecology of woodland raptors, primarily the northern goshawk (*Accipter gentilis*) and the red-shouldered hawk (*Buteo lineatus*), was studied at Pictured Rocks National Lakeshore, the East and West Units of the Hiawatha National Forest, and parts of the Copper Country State Forest. Potential limiting factors affecting the breeding success of these birds are prey density and forest management practices. Nesting habitats were identified in the field using playback calls. Habitat characteristics of forest stands were noted. The unusually late spring of 1996 may provide an analysis of naturally limiting conditions.			
36	Brigham, Edward M., Jr.	1940	Harris' sparrow in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			

37	Bull, James N.	1981	An unusually large assemblage of great blue herons; Jack-Pine Warbler	INDU
	This brief article is the author's account of a field observation of a large number of herons within the area of Cowles Bog at the Indiana Dunes National Lakeshore. He offers other references to large heron gatherings found in other publications, and some possible explanations for the behavior.			
38	Cable, Ted T. Dr.	1987	Status of the piping plover and availability of nesting habitat along the Lake Michigan shoreline in Indiana	INDU
	The study indicates if piping plovers (*Caradrius melodus*) nest on privately owned land along the Indiana shoreline of Lake Michigan, and evaluates those areas for availability of suitable nesting habitat. A status report on the piping plover is given, along with a justification for the study. A segment on public lands is also provided and potential limiting factors for the species. A chart giving the number and species of birds recorded along Lake Michigan by steel mill site is provided at the end of the report.			
39	Cahalane, Victor H.	1943	Bird list for Isle Royale, May 24 - June 12, 1943	ISRO
	no abstract available			
40	Cahalane, Victor H.	1946	Birds notes, Isle Royale, August 21 to 26, 1946	ISRO
	no abstract available			
41	Carpenter St. Croix Valley Nature Center	1990	Avian productivity monitoring	SACN
	Study is part of a national monitoring effort in cooperation with the U.S. Fish and Wildlife Service bird-banding laboratory and Point Reyes Bird Observatory of California. Objectives include monitoring the production of song-birds in various habitats, and tracking changes in productivity and population trends over time. Results from Carpenter Nature Center (located on the St. Croix) may be published by Point Reyes Observatory along with other national data.			
42	Carpenter St. Croix Valley Nature Center	1990	Long-term monitoring of wildlife rehabilitation efforts	SACN
	Research involves monitoring of results of several types of wildlife rehabilitation efforts occurring at the center (located on the St. Croix River). (1) Monitoring viability of rehabilitated wildlife when they are returned to the wild to attempt to determine whether they become part of the viable breeding population. Among other species, this has involved using radiotelemetry technology to monitor rehabilitated bald eagles. (2)Monitoring to determine success rates of rehabilitating orphaned white tail deer fawns. Center seeks to determine whether such rehabilitation is cost-effective.			
43	Carpenter St. Croix Valley Nature Center	1990	Osprey reintroduction	SACN
	Center is in the fifth year of a long-term effort to reintroduce breeding osprey in the lower St. Croix Valley. Program involves release of young osprey from a hacking tower, banding and monitoring their returns to the area. No breeding returns to date.			
44	Carpenter St. Croix Valley Nature Center	1990	Monitoring resident bird populations	SACN
	Research involves long-term monitoring of resident bird populations. Populations monitored for productivity and longevity, as well as habitat assessment. This monitoring was started in 1981, and is ongoing.			
45	Case, David J., Scharf, William C.	1985	Additions to the birds and land vertebrates of North Manitou Island; Jack-Pine Warbler	SLBE
	Identifies species and confirms others as residents or nesters of North Manitou Island, Sleeping Bear Dunes National Lakeshore, MI. 27 additional bird and 1 additional reptile species were found on the island. The scientific and common names for each species are given.			
46	Childers, Eddie L., Grundel, Ralph, Fox, Lissa	1995	Breeding birds counted at Indiana Dunes; Highlights of natural resources management 1994	INDU
	The Indiana Dunes National Lakeshore and Lake Michigan Ecological Station staffs commenced a comprehensive breeding bird survey at Indiana Dunes National Lakeshore in June of 1993. The purpose of the monitoring program is to determine long-term trends in the breeding bird population, describe bird habitat, and provide data for the national Breeding Bird Survey (BBS).			

47	Christiansen, Stacy R., Olfenbuttel, Robinson, William L.	1996	Hawk project 1996	PIRO
	This collection of woodland raptor survey forms is raw data about locations within Pictured Rocks National Lakeshore, MI of raptors and environmental conditions at sites where the birds are found. Also included are goshawk nest site habitat forms. These include data about nest, tree, and canopy heights; tree species and diameters at breast height; and flight corridors. Also included is a map of the lakeshore with locations of sightings plotted.			
48	Christopher, Kent L.	1980	A Survey of peregrine falcon habitat in Upper Michigan with emphasis on reintroduction potential	ISRO
	A survey of peregrine falcon (*Falco peregrinus*) habitat in Upper Michigan was conducted. Nesting records at 13 different eyrie sites are reviewed. An eyrie active in 1971 was the last verified nesting pair of peregrine falcons east of the Mississippi River. All historic eyries were surveyed and their present status defined, including those on Isle Royale National Park (see pages 63-64). Ten other areas with potential nesting habitat were located and surveyed. The areas studied were evaluated for reintroduction potential including a review of organochlorine residues in potential prey and status of the predator great horned owls (*Bubo virginianus*). Four areas were chosen as the best potential reintroduction sites and population projections are made.			
49	Cooper, James	1991	Effects of early and late goose-hunting seasons on populations	SACN
	Multiyear study of the special goose hunting season in the Twin Cities metropolitan area (including Washington County and the St. Croix River) and the effects of early and late special seasons on the survival of goose populations. Symposium planned for Spring, 1991.			
50	Corace III, R. Gregory, Goebel, P. Charles, Wyse, Thomas C.	2003	A multi-scale assessment and evaluation of historic openlands at Sleeping Bear Dunes National Lakeshore	SLBE
	Plant and bird communities of historic openlands (grassland-shrubland-early successional forests) at Sleeping Bear Dunes National Lakeshore are characterized at multiple scales. Species that comprise vegetation communities are identified, and status and population trends of surveyed bird species are listed. Factors that influence bird communities in fields and the role of the Lakeshore openlands relative to openland habitat availability throughout the Upper Midwest are discussed. Recommendations are made for maintaining openland bird communities. Maps display pre-European settlement vegetation, distribution of current vegetation cover types, and the location of 12 fields associated with historical agricultural sites.			
51	Cottrille, Betty Darling	1957	Summer distribution of the piping plover in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
52	Cottrille, Betty Darling	1958	Some additional bird observations in the Northern Peninsula of Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
53	Crawford, David	1989	Resource inventory and management considerations for Engelwood Development by Cottonwood Land Company	SACN
	Survey of the Engelwood Development area, identifying and inventorying habitat types. The inventory focuses on plant species, and a keyed list for species composition of each habitat type is included. Bird species observations are also included, as well as comments on a prairie opening of special concern.			
54	Croll, Stuart L.	1985	Letter to John Henderson, Michigan Department of Natural Resources, Baraga, MI	ISRO
	This letter presents information on bald eagle and osprey nesting surveys conducted on Isle Royale National Park.			
55	Cuthbert, Francesca J.	1997	History and current status of double-crested cormorants in Lake Superior	ISRO
	This is an abstract from the Lake Superior National Parks Research Conference hosted by Pictured Rocks National Lakeshore in Munising, MI on October 28, 1997. Summarizes the results of a Great Lakes regional census of double-crested cormorants. Historically, this cormorant did not nest in the Great Lakes area. Cormorants were affected by high levels of contaminants in many areas and by the 1960s it was so rare that the bird was granted protective status. The population has since recovered dramatically so that the current population size has become a concern to biologists.			

56	Cuthbert, Francesca J., Mckearnan, Joan	1998	US Great Lakes gull survey: 1998 progress report	ISRO, PIRO, SLBE
	Great black-backed gull, herring gull, and ring-billed gull nests were surveyed in 1998 to determine the size of the populations, the breeding colony sizes, and the habitats used by all three species. The progress report summarizes the data collected in 1998 and compares it to data collected in previous surveys.			
57	Cuthbert, Nicholas L.	1964	Michigan bird survey, spring 1963; Jack-Pine Warbler	PIRO
	no abstract available			
58	Cuthbert, Nicholas L.	1964	Michigan bird survey, fall 1963; Jack-Pine Warbler	PIRO
	no abstract available			
59	Cuthbert, Rothstein, Arlene	1988	Factors influencing the distribution, abundance, and reproductive success of ospreys in Voyageurs National Park, Minnesota	VOYA
	"Ospreys (*Pandion haliaetus*) were studied for two breeding seasons in Voyageurs National Park, Minnesota, to determine factors that influence their distribution, abundance and reproductive success. Osprey distributions and reproductive success was estimated from aerial and ground nest surveys conducted in spring and late summer. Nests were categorized according to their proximity to the four largest bodies of water which represented different levels of water fluctuation, fish productivity and human disturbance." (Excerpts from author's abstract)			
60	Daggett, Frank S.	1890	Isle Royale; Ornithologist and Oologist	ISRO
	Refers to early sighting of peregrine falcon at Isle Royale on Gull Islands.			
61	Delong, Bruce L.	1980	Bird banding records for Stockton Island, years 1974-1977-1980	APIS
	This report includes a checklist of species banded on Stockton Island between June 8-14, 1974 and June 13-20, 1977.			
62	Delong, Bruce L.	1983	1982-1983 List of birds banded and a second checklist of the birds observed on Outer Island, Apostle Islands National Lakeshore	APIS
	This report contains a list of birds banded on Outer Island during June of 1982 and 1983.			
63	Derr, Mary C.	1995	Mercury contamination in the piscivorous waterbird community of Voyageurs National Park, Minnesota	VOYA
	Mercury, a persistent environmental contaminant, is biomagnified in aquatic systems and can negatively affect survival and reproductive success in high trophic-level wildlife such as piscivorous birds. In this study I examined mercury levels in three piscivorous waterbird species breeding in the lake system of Voyageurs National Park, in northern Minnesota: the Red-necked Grebe (*Podiceps grisegena*), Common Merganser (*Mergus merganser*), and Hooded Merganser (*Lophodytes cucullatus*). I hypothesized that differences among these species in diet composition and habitat use would lead to differences in exposure to mercury. The objectives of this study were to 1) document mercury levels in the study species; 2) compare levels among these three species and between these and two other co-occurring waterbird species, a larger piscivore, the common Loon (*Gavia immer*), and a non-piscivore, the Common Goldeneye (*Bucephala clangula*); and 3) infer possible effects of mercury contamination on reproductive success in the study populations.			
64	Dodge, Kevin M.	1983	Relationship of wood warbler distribution to the deciduous-coniferous vegetation gradient on Isle Royale	ISRO
	The apparent habitat affinities of seven species of wood warblers were quantified along a deciduous forest vegetation gradient on Isle Royale National Park. The structural configuration of the vegetation appears to be more significant to the distribution of these warblers than plant species composition.			
65	Dodge, Percival	1961	Birds of the Huron Mountains, Marquette County, Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
66	Doolittle, E. A.	1906	The summer birds of Grand Island	PIRO
	no abstract available			

67	Doolittle, Thomas C. J.	1988	Status, distribution, and breeding biology of the merlin, *Falco c columbarius* , in the Upper Midwest region 1988 progress report	APIS ISRO
	The author completed one summer field season of a research project investigating the population status and distribution of merlins in the Upper Great Lakes region, to determine natural and\or artificial limiting factors affecting merlin productivity, and to define research and management needs to benefit the reproductive success of the species. In 1988, occupied merlin territories were found in Voyageurs National Park, Apostle Islands National Lakeshore, and Isle Royale National Park (eleven). None were found in Pictured Rocks National Lakeshore. Twenty-six occupied nests resulted in 37 young; 13 nests hatched more than one egg. Twenty young and fourteen adults were banded with U.S. Fish and wildlife Service leg bands. Prey remains at the nest site were collected and identified. Unhatched eggs and molted feathers were collected and will be analyzed for contaminants. Food stress may be occurring on Isle Royale where some unusual prey species were collected and observations showing both adult birds absent from their nest prior to fledging.			
68	Doolittle, Thomas C.	1989	Status of the eastern taiga merlin (*Falco c columbarius*) in the upper Midwest region	APIS ISRO
	In the summer of 1988 a research project was initiated to determine the status of the Eastern Taiga Merlin (*Falco c. columbarius*) in the Upper Midwest Region. The objectives of the study are: 1) determine the population status and distribution of merlins in the Upper Midwest; 2) determine natural and/or artificial limiting factors affecting merlin productivity; and 3) define research and management needs, if any, to benefit the reproductive success of the species. In 1989 I censused breeding pairs, monitored breeding success, visited historic sites, noted food use, and assessed survey techniques. In addition, molted feathers, un-hatched eggs, and dead young were collected for contaminant analyses.			
69	Doolittle, Thomas C.	1992	Status of the eastern taiga merlin (*Falco c columbarius*) in the upper Midwest	APIS ISRO
	Migration data from Upper Midwestern banding stations and migratory counts suggested a strong increase in merlin populations beginning in 1984. Merlin breeding densities were low, but aggregated within parts of the study areas. Eighty-nine breeding adults (57 males and 32 females) were captured and banded. The turnover of adult male merlins was estimated at 86%. Usually, merlins selected corvid nests in white pine trees as nesting sites. Nest woods with multiple nests were more stable than territories with a single nest. Most nests were within 150 meters of a dominant edge, usually a lake with an irregular shoreline exceeding 161 km in length. Factors such as the deterioration of aquatic habitats due to anthropogenic toxins and a decline in the prey base are, or could be, a local problem. However, present merlin populations throughout the region seem to be increasing. One factor augmenting population growth is their ability to nest in urban environments. Lastly, a significant increase of American crow populations may have created more available nests on shorelines for merlins to use.			
70	Doran, Kevin; Kenner, Brian C.	1994	The Hiawatha breeding bird survey. Abstract in Lake Superior National Parks research conference	PIRO
	A breeding bird survey has been conducted each year in early June since 1989 on the Hiawatha National Forest, Seney National Wildlife Refuge, and Pictured Rocks National Lakeshore, MI. The point count method has been employed on approximately 150 plots annually. Bird identification is done by ear and sight. Discussion includes evidence of bird population trends, bird habitat relationships, and how the monitoring program contributes to international bird monitoring efforts.			
71	Dow, Douglas	1991	Pictured Rocks National Lakeshore survey of nesting birds: Beaver Rim Road right-of-way	PIRO
	Birds were observed along a 12 mi. long by 1/2 mi. wide corridor from Legion Lake to the Hurricane Campground areas of Pictured Rocks National Lakeshore, MI during May-July 1990. Data were needed to document the presence of breeding birds in the proposed Beaver Basin Rim Road corridor. A secondary study area included the area between the Hurricane River and Sable Creek. Observations were made from 379 sampling points, spaced at least 220 yd. apart in 9 different vegetation communities. Birds were identified visually and by their vocalizations, beginning 30 min. before sunrise and continuing until no later than 1100 hrs. Some areas were visited at night to detect owls, etc. The most common species, their frequency, and the relative density of certain species in specified habitats are noted. An annotated list of bird species is provided. No threatened or endangered species were observed, but comments are provided about their recorded presence. Differences between diversity of birds inhabiting the Fee Zone and the Inland Buffer Zone, where logging occurs, is discussed.			
72	Eifrig, C.W.G.	1918	Birds of the sand dunes of Northwest Indiana; proceedings of the Indiana Academy of Sciences	INDU
	This article lists the birds of the sand dunes of Lake and Porter counties, and the current Indiana Dunes National Lakeshore. The list was compiled by the author on trips to the area in 1918. Each species is listed by scientific and common name, followed by a brief account of the author's observance of it.			

73	Eliason, Bonita	1991	Minnesota County biological survey--1988 bird surveys	MISS
	Document referenced from the Web site of the National Water Quality Assessment--Upper Mississippi Watershed. Contact the U.S. Geological Survey, Mounds View, Minnesota, for further details.			
74	Emerick, Lon	1988	Pictured Rocks National Lakeshore bird survey data	PIRO
	This species list of birds observed in the mid-1980s at Pictured Rocks National Lakeshore, MI by the author includes notes on habitat, location, abundance, and season of observation.			
75	Ensor-Giovengo, Keren L.	1996	Contaminant exposure of bald eagles via prey at Voyageurs National Park, Minnesota, 1993	VOYA
	During the 1993 breeding season, bald eaglet plasma and feathers, and preferred prey items from sites in Voyageurs National Park were obtained for organochlorine and mercury analysis. This report contains the analysis data and discussions of the noted contaminants on the reproductive success of bald eagles in Voyageurs National Park.			
76	Erickson, Ron	1993	The ever changing Mississippi: quality, use, perceptions	MISS
	A collection of abstracts concern the river's history, water quality, bald eagles, cultural resources, visitor use, freshwater mussels, refuges, habitat, and management.			
77	Evers, David C.	1996	1996 Investigators annual report: North American loon biomonitoring project - Isle Royale National Park	ISRO
	Presents findings from the 1996 summer field season on the project to investigate the population ecology, behavior, and contaminant levels in common loons that nest along shoreline habitats of Isle Royale National Park. Adult males were vocal tagged.			
78	Evers, David	1997	A guide to the birds of the Hiawatha National Forest	PIRO
	This guidebook presents information about the avifauna of the Hiawatha National Forest, a close neighbor of Pictured Rocks National Lakeshore, MI. Endangered, threatened, and special concern species at both the federal and state levels are discussed. The information about these and other bird species is contained in a checklist that features the habitats in which they may be found, their general abundance, and seasonal occurrence.			
79	Evers, David C., Reaman, Peter S., Kaplan, Joseph D.,	1995	North American loon biomonitoring program: 1995 field seasonal final report, 1989-1995 comprehensive report	ISRO
	The North American loon biomonitoring program's research topics include behavioral studies, monitoring individuals through a variety of marking efforts, contaminants investigations, and population dynamics through observation and genetic sampling. Most of the banded loons had blood and feather samples taken to examine the extent and degree of mercury bioaccumulation, and incorporated in investigations of genetic and physiological studies. The common loon is extremely site faithful to its nesting territory, however should a nest fail there are frequent examples of mate switching. Some adults do not necessarily return to their nesting territory. Quantifying the loons' behaviors through time-activity budgets is proving valuable in unlocking some of the subtle sexual and between-site differences. There are some concerns that contaminants, particularly mercury, are having adverse effects on the reproductive success, behavior, and survivorship of loons. The common loon appears to be extremely sensitive to environmental loads of methyl mercury and serves as an excellent biosentinel for this heavy metal.			
80	Faanes, Craig A.	1981	Birds of the St. Croix river valley: Minnesota and Wisconsin; North American Fauna	MISS, SACN
	A complete treatment of the 314 bird species found along the Riverway. The work provides background and maps on climate, geology, physiography and land use, general habitat and bird distribution in the river valley. Organized by family, each species account provides details on habitat, migration, nesting, and status. Also included are a list of references, a list of plants used in the text (by common, with scientific names), and a bird species index.			
81	Fargo, William C.	1924	Notes -- here and there; Wilson Bulletin	ISRO
	Sightings of birds on Isle Royale.			
82	Fekete, John; Holden, Max Ray	1986	No Title	SLBE
	A note describing a recent bird banding trip led by William Scharf to South Manitou Island, Sleeping Bear Dunes National Lakeshore. A description of the gull colony by Scharf is also included.			

83	Fleugel, James B.	1943	Some Alger County bird observations; Jack-Pine Warbler	PIRO
	Bird sightings from Alger Co., MI. Citation only from Foster, Wm., 1975.			
84	Fleugel, James B.	1944	Some November, 1943 bird notes from Alger County, Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
85	Foster, William L., Paddock, Mark W.	1975	Birds of Pictured Rocks National Lakeshore; natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	PIRO
	Checklist of the birds of Pictured Rocks National Lakeshore, MI lists 180 species by common name and provides citations from 17 authorities, dating from 1940 through 1970. The author lists separately the species and locations of birds observed in Alger County from Norman Wood's "The Birds of Michigan" (1951). Special note is made of unusual sightings over the years from various observers: Richardson's goose (*Branta canadensis leucopareia*), American avocet at Sand Point in 1973, and a nesting bay-breasted warbler near Grand Sable Dunes in 1974.			
86	Foster, William L., Paddock, Mark W.	1975	Birds of the Sleeping Bear Dunes National Lakeshore Area; natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	SLBE
	Contains sections concerning: checklists of birds for the Sleeping Bear Dunes National Lakeshore area (Benzie and Leelanau Counties), winter birds, endangered species, bird interpretation for visitors, passenger pigeon, South Manitou Island gull colony, and bald eagles. The checklist contains 229 species compiled by literature search and the personal observation by five authorities.			
87	Fox, Glen A., Gilbertson, Michael, Gilman, Andrew P., Kubiak, Timothy J.	1991	A rationale for the use of colonial fish-eating birds to monitor the presence of developmental toxicants in Great Lakes fish; Journal of Great Lakes Research	ISRO
	This editorial presents reasons to monitor colonial fish-eating bird populations in the Great Lakes area to assist in the detection of developmental toxicants which may affect the human population.			
88	Francke, Chip, Graf, Leonard	no date	Birds of Leelanau County and Sleeping Bear Dunes National Lakeshore: an annotated checklist	SLBE
	no abstract available			
89	Gensch, Robert H.	1946	List of birds seen on Isle Royale National Park, Michigan from May 8, 1946 to June 4, 1946	ISRO
	no abstract available			
90	Gilbert, Karl T.	1946	Isle Royale birds list, National Park Service	ISRO
	no abstract available			
91	Gilman, Andrew P., Peakall, D. B., Hallett, Douglas J., Fox, Glen A., Norstrom, R. J.	1979	Herring gulls (*Larus argentatus*) as monitors of contamination in the Great Lakes. IN: Animals as monitors of environmental pollutants, National Academy of Sciences, Washington, DC 421 p	ISRO
	no abstract available			
92	Goddard, S.V.	1972	Comparison of breeding bird populations of the Lower Kinnicinnic River Valley; The Passenger Pigeon	SACN
	Summary of survey of breeding bird species, frequencies and locations of sightings, 1970 and 1971			
93	Goddard, S.V.	1975	Spring waterfowl utilization of western Wisconsin wetlands; The Passenger Pigeon	SACN
	Summary of a four-year study of spring migrations, 1968-71. Includes counts by species.			

94	Gostomski, Theodore J.	1995	Results of the 1995 colonial waterbird survey at Isle Royale National Park, Michigan; Isle Royale National Park Resource Management Report 95-2	ISRO
	A comprehensive survey of the four species of colonial waterbirds at ISRO (herring gulls, ring-billed gulls, great blue herons, and double-crested cormorants) was conducted in 1988. Since then a dramatic increase in the Great Lakes cormorant population has occurred. Also, a 1992 outbreak of the exotic Newcastle's disease in cormorants at the Apostle Islands created the need to document any outbreak of the virus among ISRO cormorant colonies. However, no visible indications of Newcastle's disease was found. A total of 90 active waterbird colonies were located, 82% of which were occupied by herring gulls. Behavioral observations and aspects of multi-species colonies are discussed. Information on these are located in files in the Natural Resource Specialist's office.			
95	Gostomski, Theodore J.	1995	Royale rarities: notes on unique bird observations at Isle Royale National Park, 1995 Isle Royale National Park resource management report 95-5	ISRO
	Isle Royale National Park is an ideal stop-over site for northern birds migrating to and from their boreal breeding grounds. Unique observations of bird species between May and September, 1995, were compiled to add to similar published information, to document the presence of species not previously recorded in the park, and to report important observations of previously-recorded species. Observations of 25 species of birds are detailed in this report, one of which (the harlequin duck, *Histrionicus histrionicus*) was the first recorded sighting of the species on Isle Royale. Observations of three other species (red-necked phalarope, *Phalaropus lobatus* ; rufous-sided towhee, *Pipilo erythrophthalamus* ; and lark sparrow, *Chondestes grammacus*) represent only the second or third record of the species on the island.			
96	Gostomski, Theodore J.	1997	Observations of great gray owls (*Strix nebulosa*) within the Apostle Islands National Lakeshore and surrounding area, Bayfield and Ashland counties; The Passenger Pigeon	APIS
	Recent spring and summer sightings of great gray owls in the Apostle Islands region suggest that the species may be nesting there.			
97	Gostomski, Theodore J., Oelfke, Jack G.	1994	Results of the 1994 breeding bird survey: Isle Royale National Park, Michigan Isle Royale National Park resource management report 94-1	ISRO
	Point counts were conducted to establish a data base on the relative abundances of neotropical migrant landbirds in Isle Royale National Park. Transects were established using six of the park's trails, along which a total of 75 points were plotted among eight different habitats using the stratified random sampling method. Each point was visited for one ten-minute period during which time all bird species seen and heard were recorded. A total of 1008 birds comprising 56 species were identified.			
98	Gostomski, Theodore J., Oelfke, Jack G.	1994	1994 Raptor survey: update and review, Isle Royale National Park, Michigan Isle Royale National Park resource management report 94-2	ISRO
	Location and monitoring of raptor nests, focusing on bald eagles (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*), has been conducted in Isle Royale National Park since 1989, with some information dating back to 1984. This report is the results of that continuing effort, detailing the reproductive activities of both focal species for 1994. An aerial survey and ground monitoring was conducted. Occupied nests were identified; eaglets were fledged as were young osprey. Peregrine falcon (*Falco peregrinus*) sightings are discussed and a theoretical life table for the island's population is expanded to include 1994 calculations. Observations of other raptors are reported.			
99	Gostomski, Theodore J., Oelfke, Jack G.	1995	1995 Raptor inventory at Isle Royale National Park, Michigan Isle Royale National Park resource management report 95-3	ISRO
	Efforts to monitor the locations and productivity of bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) nests in Isle Royale National Park were continued in 1995. A preliminary overflight was conducted to identify active nest sites, and this was followed up with a second flight to determine reproductive success at each of the nests. Less intensive monitoring of other raptors consisted of maintaining sight records except for observations of peregrine falcons (*Falco peregrinus*) which were investigated when they were reported. Other raptor observations included a number of observations of a northern race of the great-horned owl (*Bubo virginianus subarcticus*), which inhabits central Canada. Recommendations for 1996 are discussed and include the complete integration of the "location-number" identification system proposed in 1994. A multi-year analysis of eagle and osprey productivity is suggested. A topographic map marked with locations of raptor nests in 1995 can be found in a file in the Natural Resource Specialist's office labeled "Raptors - 1995".			

100	Gostomski, Theodore J., Oelfke, Jack G.	1995	1995 breeding bird survey at Isle Royale National Park, Michigan Isle Royale National Park resource management report 95-4	ISRO
	Isle Royale National Park established a formal breeding bird survey in 1994 to integrate island population data with other studies being conducted in the region. This program continued in 1995 with the objective of determining the size and composition of the neotropical migrant community on Isle Royale. This single objective approach represents a shift in focus from the 1994 survey. Supporting statements for this change are presented. Point counts were conducted at Isle Royale using eight park trails as transects. A total of 85 points were surveyed. Species diversity values were calculated for each point and then averaged for each transect. Point count data are presented with the first 5-minute and total 10-minute counts shown separately. Comparisons between 1995 and 1994 are discussed. Recommendations for future surveys are made.			
101	Gostomski, Theodore J., Oelfke, Jack G., Van Stappen, Julie	1996	Current avian research at Isle Royale National Park. Abstract in Proceedings of the Lake Superior National Parks research conference	ISRO
	Avian research at Isle Royale in 1995 involved four separate surveys focusing on colonial waterbirds, neotropical migrant landbirds, raptors, and the common loon.			
102	Gostomski, Theodore J., Van Stappen, Julie F.	1996	1996 Breeding bird survey report: Apostle Islands National Lakeshore	APIS
	The Apostle Island National Lakeshore provides a diverse mosaic of habitats that are important for nesting resident and neotropical migrant landbirds. The 1996 breeding bird survey was conducted from 10 June to 3 July. Data analysis included calculating species diversity and the number of birds per stop for each island and each habitat. ANOVA was used to analyze trends in the total number of birds observed on each of the islands since 1991. Significant declines ($p<0.02$) were observed on all transects except Oak and Long Islands. Sixty-nine species were identified among 995 individuals within the Lakeshore. Sand Island supported the highest number of birds per stop, while the greatest number of species was identified on Stockton Island. Among habitats, pine forests exhibited the highest number of birds per stop and contained the greatest number of species. The total number of birds observed has steadily declined since 1991. Seventy species exhibited below average abundances in 1996. Among those, 90% were migrants.			
103	Gostomski, Theodore J., Van Stappen, Julie F.	1997	Apostle Islands National Lakeshore 1997 breeding bird survey October 1997	APIS
	Ten minute counts were conducted at 106 permanently marked points along 10 transects from June 9 to 29, 1997. Data were collected to determine number of individuals, species diversity, and habitat types used.			
104	Grand Portage National Monument	1991	Swallow monitoring, Grand Portage National Monument, 1987 - 1991	GRPO
	This is a hand-written informal survey of swallow nests located in the great hall, the kitchen, and the gatehouse. Monitoring took place from 1987 to 1991.			
105	Green, Janet C.	1964	Spring migration, Western Great Lakes Region; Audubon field notes	PIRO
	no abstract available			
106	Green, Janet C.	1964	Winter season, Western Great Lakes Region; Audubon field notes	PIRO
	no abstract available			
107	Grim, Leland H.	1972	Birds of the Fort Frances/International Falls Rainy Lake area	VOYA
	Since 1968, the Biology Department at Rainy River State Junior College has kept its own records of birds occurring in the International Falls, Minnesota area. Data presented is based solely on the annual records kept by the biology department through its class sightings and information provided by interested citizens from the community. Frequency, seasonal distribution, and dates of first spring sighting of returning migrants in 1972 are provided for nearly 200 species of bird.			
108	Grim, Leland H.	1974	Birds of the Fort Frances/International Falls Rainy Lake area	VOYA
	Since 1968, the biology department of Rainy River State Junior College has kept records of birds occurring in the International Falls area. Data presented is based solely on the annual records kept by the Biology Department through its class sightings and through information provided by interested citizens in the community. Frequency, seasonal distribution, and dates of first spring sightings of returning migrants in 1974 are provided for nearly 200 species of birds.			

109	Grim, Leland H.	1986	Investigator's Annual Report	VOYA
	Annual reports that summarize the progress of ongoing research being conducted in Voyageurs National Park. These particular reports (for the years, 1986, 1988, and 1989) primarily discuss bald eagle, osprey, and colonial nesting waterbird research. Some raw data concerning these species is presented in table form.			
110	Grim, Leland H.	1986	Birds of Voyageurs National Park	VOYA
	Leaflet presenting a list of all birds, including aquatic, known to be present in Voyageurs National Park. Species are listed by common name, with symbols indicating abundance, sighting frequency, seasonal distribution, and nesting evidence.			
111	Grim, Leland H.	1989	Annual census of colonial nesting waterbirds (1973-1989)	VOYA
	no abstract available			
112	Grim, Leland H., Kallemeyn, Larry W.	1995	Reproduction and distribution of bald eagles in Voyageurs National Park, Minnesota, 1973-1993	VOYA
	In 1973, the NPS began monitoring the distribution and reproduction of bald eagles in and immediately adjacent to Voyageurs National Park to obtain data that park management could use to protect bald eagles from the effects of use of the park by visitors and from the expansion of park facilities. Thirty-seven breeding areas were identified during 1973-93. The annual number of breeding pairs tripled, the mean number of fledged eaglets increased five times, and reproductive success doubled during the study. However, in more than 15 of the breeding seasons, the mean productivity and the annual reproductive success in Voyageurs National Park were below the 1 fledgling/occupied nest and the 70% reproductive success that are representative of healthy bald eagle populations. We suspect that toxic substances, human disturbance, severe weather, and lack of food in early spring may have kept bald eagles in Voyageurs National Park from achieving breeding success that was similar to that of conspecifics in the nearby Chippewa National Forest.			
113	Grim, Leland H., Lammie, Samuel R., Schaberl, James P.	1995	A forest breeding bird survey protocol for conducting point counts in Voyageurs National Park, Minnesota	VOYA
	In Voyageurs National Park, resource biologists are beginning to develop a breeding bird inventory and monitoring (I&M) program in order to estimate both short and long term avian population trends, define habitat associations of avian trends, discover invasions of exotic species in the Park, and document any recovery periods following significant declines that may occur in bird species. The initial goals of this study are to develop protocols for surveying the species of forest breeding birds present in representative forest habitat in the Park and establish ten-point count locations for the survey. This document describes the protocol to be used and identifies the point count locations. It also provides detailed instructions on completing survey forms and processing data collected.			
114	Grim, Leland H., Schaberl, James P.	1996	Voyageurs National Park breeding bird survey data, 1995-96	VOYA
	Computer printout of 1995 and 1996 breeding bird surveys done in Voyageurs National Park. Data includes species codes, AOU #s, and numbers of individuals identified.			
115	Grundel, Ralph	1993	Untitled: nightjar survey data 1993-1997	INDU
	This document consists of raw data from nightjar surveys conducted at various locations throughout the Indiana Dunes National Lakeshore between 1993 and 1997. Each of the three survey data sheets includes basic information on environmental conditions, number and locations of whip-poor-wills, chuck wills-widow, and nighthawks heard, and road noise conditions.			
116	Grundel, Ralph	1996	Bird banding inventory/data sheets	INDU
	Data was recorded on birds banded at Inland Marsh and Beverly Shores in the Indiana Dunes National Lakeshore. Data sheets include information on bird species, band number, alpha code, age, sex, skull and wing characteristics, weight, and location netted.			
117	Grundel, Ralph	1996	Untitled: bird behavior and foraging study vegetation data	INDU
	These raw data sheets indicate bird behavior and vegetation observations made at different locations throughout the Indiana Dunes National Lakeshore, including Inland Marsh, Miller Woods and Beverly Shores. Information on data sheets includes bird species, behavior, substrate parameters, foraging maneuvers, vegetation cover, and other behaviors. Additionally, there are data sheets for vegetation at foraging study sites. These sheets show vegetation height, woody vegetation, and distance from trees to plot centers.			

118	Grundel, R., Simons, T. R.	1994	Neotropical migratory bird workshop and research; Park Science	ISRO
	Citation found in "1995 Breeding bird survey at Isle Royale national Park, Michigan, resource management report 95-4." by Theodore J. Gostomski and Jack G. Oelfke, September, 1995.			
119	Gunderson, Harvey L.	1954	Fall migration, Western Great Lakes Region; Audubon field notes	PIRO
	no abstract available			
120	Gunderson, Harvey L.	1957	Winter season, Western Great Lakes Region; Audubon field notes	PIRO
	no abstract available			
121	Halbert, Rick, Marble, Alan	no date	Bird list of Sleeping Bear Dunes National Lakeshore	SLBE
	A list of bird species in Sleeping Bear Dunes National Lakeshore, Michigan. For each species, the following are listed: abundance, resident status (year-round, summer, or winter), and migrant or vagrant status.			
122	Harger, Elsworth	1965	Michigan bird survey, summer 1964; Jack-Pine Warbler	PIRO
	no abstract available			
123	Harris, James T.	1976	Birds recorded at Outer Island April 26, 1976 to June 3, 1976	APIS
	This report includes a list of birds observed on Outer Island between April 26 and June 3, 1996. The list includes information on locations where birds were observed and relative abundance.			
124	Harris, James T.	1976	Wisconsin bald eagle breeding survey - 1985	APIS
	This report includes the results of an informal bird survey conducted on Michigan Island, Apostle Islands National Lakeshore, September 24-28, 1976. A species list is included.			
125	Harris, James T.	1977	The Apostle Islands: concentration area for migratory birds in spring	APIS
	The behavior of land bird migrants in the Apostle Islands was studied to determine the significance of these islands as stopover locations and to outline how Lake Superior affects migration patterns. Results apply only to migrants flying low enough to be visible from the ground. By day the great majority of north-flying passerines and raptors turned about upon encountering the open lake at the north shores of Outer and Devil's Islands. In the early morning, passerines that migrated by night were also observed flying south off the lake onto the islands. A small number of day migrants headed north across Superior. Results indicated that the south tip of Outer is the best observation site in the Apostles. A large reverse migration was observed here, and to a lesser extent off south Devil's, directed south toward the inner islands. On Outer, as many as 500 hawks were visible at once, and up to 3100 passerines were counted in flight within a half hour period. On the inner Apostles, raptors and passerines were noted flying north, south, and parallel to the shoreline, as if hesitant to cross water.			
126	Harris, James T.	1978	The Apostle Islands: concentration area for migratory birds in fall	APIS
	Fall migration on Outer Island was observed from 28 August to 11 September. Primary data collections consisted of 1/2 hour watch periods made at the north and south ends of Outer. We recorded number, species, flight direction, and behavior of migrants, along with weather data. In total we completed 138 watches, including 103 on Sand Point, 27 at the lighthouse, and 8 at Austad Bay. In addition, we examined bird use of the sand spit and adjacent bog at the south end of the island and generally noted bird activity throughout our stay on Outer. We noted large passerine flights south off the south end of Outer toward Stockton Island. These flights resembled spring flights at the same location, with similarly (and spectacularly) large numbers of birds. The average passerine count per watch was 167 birds. On three out of our 12 observation mornings at the sand spit, we recorded maximums of 1,408, 1,969, and 1,665 individuals flying south during single observation periods. As in spring, flights were heavily concentrated during the first two hours after sunrise.			
127	Harris, James T.	1980	Autumn migration in the Apostle Islands: late September and early October	APIS
	Fall migration on Outer Island was observed from 22 September to 3 October, and on Michigan Island from 28 September to 3 October. Large passerine flights were noted south off the south end of Outer toward Stockton Island. The average passerine count per watch (1/2 hour) was 239 birds. The largest flight was on September 28 when a total of 9,452 migrants flew south off the island in eight 1/2 hour morning watches.			

128	Harris, James T., Jaeger, Michael John	1978	Annotated list of spring birds observed in the Apostle Islands, 1976 and 1977; The Passenger Pigeon	APIS
	This article includes an annotated list of spring birds observed in the Apostle Islands during 1976 and 1977 as well as results of spring migratory bird surveys. Harris chose the Apostles as the location for an intensive study into the effects of Lake Superior on northward spring bird migration. The Apostles host a spring hawk flights of considerable size. During the two-year study period, over 6,000 hawks, vultures, and eagles of 14 species were observed. Lake Superior also impedes northward passage of passerines. Lake hawks, most passerines migrating by day turn about at the north edge of the Apostles. Passerines migrating by night cross the water in darkness. But apparently those migrants finding themselves at day break a short way out over Lake Superior return to the northern islands. The passerines filter down the length of Outer to Sand Point and, concentrated in this narrow place, cross in great numbers to the inner islands. At the base of Sand Point spectacular flights were seen, with up to 1000 and even 3000 individuals passing in a half hour period.			
129	Hebig, Ann	1995	Checklist of birds of the St Croix Riverway basin	SACN
	A comprehensive work, each animal is listed with common name, taxonomy and general distribution. Also provided is a source list.			
130	Hebig, Ann	1996	Population information for federally listed species	SACN
	The range, numbers, locations, and common and scientific name for five animal species (bald eagle, gray wolf, peregrine falcon, and Higgins' eye and winged-mapleleaf mussel) that are federally endangered or threatened on the St. Croix river are included in this document. There is also source list and a distribution map for the wolf and the winged mapleleaf.			
131	Henderson, Carrol L.	1982	Minnesota colonial waterbird nesting site inventory; Journal of the Minnesota Academy of Sciences	SACN
	Identified nesting sites of colonial waterbirds, including eared grebe, western grebe, white pelican, cormorant, herons, egrets, night herons, gulls and terns) in Minnesota. 239 colony sites identified and mapped.			
132	Hermann, F. J.	1981	Status of birds on Isle Royale vs. on the Keweenaw Peninsula in summer	ISRO
	A comparison of the remarkable discrepancy between the status of nearly 40 species of birds on the Keweenaw mainland and on Isle Royale. There is a disparity between Isle Royale and the mainland in the frequency of these species during the breeding season, in spite of comparable habitats.			
133	Hoffman, Molly	1999	1999 GRPO breeding bird survey	GRPO
	no abstract available			
134	Hofslund, P. B.	1966	Hawk migration over the western tip of Lake Superior; The Wilson Bulletin	ISRO
	no abstract available			
135	Hogg, E. H., Morton, J. K.	1983	The effects of nesting gulls on the vegetation and soils of islands in the Great Lakes; Canadian Journal of Botany	ISRO
	no abstract available			
136	Hudick, Joseph P., Van	1982	Breeding bird survey spring of 1982	SACN
	The report describes the adaptation of the U.S. Fish and Wildlife Service's Breeding Bird Survey Program for use on the Riverway, rather than roadways. A sample run on the St. Croix River from Taylor’s Falls to Stillwater provided baseline data on populations of breeding birds along the river. Any changes in the survey to accommodate river use are noted. Field sheets are attached to the report.			
137	Isaacs, Frank B.	1976	Historical survey of peregrine falcon eyries in National Park Service lands bordering lake Superior	ISRO, PIRO
	Pages 71-76 of this thesis contain information pertinent to Isle Royale National Park. Information includes historical sightings of peregrine falcons on Isle Royale and a survey of historical site locations. Appendix figures present information pertinent to Isle Royale including a description of areas surveyed in Isle Royale for possible peregrine falcon use in 1975; and a more complete description of three areas on Isle Royale considered for peregrine reintroduction.			

138	Isaacs, Frank B., Sloan, Norman F.	1979	Historical survey of peregrine falcon eyries in National Park Service lands bordering Lake Superio. Proceedings of the 1st conference on scientific research in the National Parks, National Park Service Transactions and Proceedings Series, Number 5	ISRO, PIRO
	Results of a study of the history, current status, and possibilities for reintroduction of the peregrine falcon into areas in Isle Royale National Park, Pictured Rocks National Lakeshore, and the Apostle Islands National Lakeshore. Two eyries were documented for Isle Royale National Park and three areas of Isle Royale were described as suitable habitat.			
139	Isle Royale National Park	no date	Bird observation on Isle Royale National Park, volume I	ISRO
	The document is a compilation of bird observations at Isle Royale from 1960 through 1974. For each species observed, the information included in this compilation is date, time, location and activity, and observer's initials.			
140	Isle Royale National Park	no date	Bird observation on Isle Royale National Park, volume II	ISRO
	The document is a compilation of bird observations at Isle Royale from 1960 through 1974. For each species observed, the information included in this compilation is date, time, location and activity, and observer's initials.			
141	Jackson, Hartley H. T.	1941	8 articles: Summer birds of northwestern Wisconsin; The Passenger Pigeon	APIS
	The bound articles are primarily a listing of birds by species that were observed by Hartley Jackson. Notes on where the species were found as well as information on abundance and distribution are included.			
142	Jacokes, Renee Lynn	1990	An analysis of correlations between remotely sensed water anomalies and snail colonies in Glen Lake	SLBE
	Determined there is a correlation between remotely sensed water anomalies in Glen Lake, Sleeping Bear Dunes National Lakeshore, MI and the location of snail colonies. Water anomalies, observed by aerial photography and satellite Thematic Mapper data, were most likely caused by nutrient enrichment. Snail density generally determined to be higher where natural effluent or human activities occurred. Chemical (fluorine, chlorine, phosphorous, nitrite, and sulfate) and chlorophyll a concentrations were determined. There is a map showing the land use/cover of the Glen Lake watershed.			
143	Janke, Robert A., Janke, Nadine	1964	The birds of Isle Royale National Park	ISRO
	Describes fifty species of birds present on Isle Royale during the warmer summer months between the spring and fall migrations, corresponding with the visitor season; this booklet is written for the summer visitor to Isle Royale.			
144	Janke, Robert A., Peterson, Rolf O., Lindsay, Terrance	1994	Isle Royale National Park checklist of birds	ISRO
	A checklist of 168 species of birds found on Isle Royale.			
145	Johnson, J.T.	1997	Grand Portage ruffed grouse drumming survey	GRPO
	no abstract available			
146	Johnson, Steve	1994	Birds, mammals, fish in Mississippi corridor	MISS
	A collection of lists from various sources detailing the species of birds, mammals and fish found within the Park's corridor. The mammals are listed by common and scientific name, and abundance noted. Birds are listed only by common name. Fish are listed by common and scientific name, and abundance noted by pool.			
147	Jung, R. E.	1987	An assessment of human impact on the behavior and breeding success of the common loon (*Gavia immer*) in the northern lower and eastern upper peninsulas of Michigan	ISRO
	no abstract available			

148	Kallemeyn, Larry W., Cole, Glen F.	1990	Alternatives for reducing the impacts of regulated lake levels on the aquatic ecosystem of Voyageurs National Park, Minnesota	VOYA
	Lake levels in Rainy Lake and the Nakmakan Reservoir within Voyageurs National Park are controlled by a single hydropower facility and two small regulatory dams.. This system uses larger than natural fluctuations in lake levels on Namakan Reservoir to maintain less than natural fluctuations on Rainy Lake. A research program was initiated to address concerns about the effects of these lake levels on aquatic biota, and to address concerns from a variety of interest groups that utilize the park for recreation. The research consisted of: 1) assessing the effects of the present water management program of the park's aquatic ecosystem, and 2) developing a hydrological model to assess the effects of alternative regulatory programs on power generation or other public purposes. Research studies were conducted on: 1) aquatic vegetation and benthic organisms, 2) the fish community, 3) shore and marsh nesting birds, 4) beaver and muskrat, 5) osprey, 6) river otter, 7) primary production, 8) archeological resources, and 9) the relationship between lake levels and boat docks, navigation, flood control and power production.			
149	Kelley, Alice H.	1965	Michigan bird survey, spring 1965; Jack-Pine Warbler	PIRO
	no abstract available			
150	Kelley, Alice H.	1965	Michigan bird survey, summer 1964; Jack-Pine Warbler	PIRO
	no abstract available			
151	Kelley, Alice H.	1965	Michigan bird survey, winter 1964; Jack-Pine Warbler	PIRO
	no abstract available			
152	Kelley, Alice H.	1965	Michigan bird survey, summer 1965; Jack-Pine Warbler	PIRO
	no abstract available			
153	Knue, Alan J.	1989	Natural history observations on Long Island, May 2-8, 1989	APIS
	During the period of May 2 through May 18, a total of 142 species of birds and at least 18 species of mammals were observed. Long Island seems to be an important staging area for migrating birds, as demonstrated by the data collected. Several important observations were made during the study period: observations of piping plover, the discovery of an active bald eagle nest, the presence of a pair of merlins, and an apparent healthy population of ruffed grouse. Although much was learned about the natural history of Long Island, much remains to be learned.			
154	Krefting, Laurits W.	1946	Daily notes on trip to Isle Royale National Park, May 9-17, 1946	ISRO
	no abstract available			
155	Krefting, Laurits W., Lee, Forrest B.	1963	Observations on the birds of Isle Royale, August 5-9, 1963	ISRO
	no abstract available			
156	Krefting, Laurits W., Lee, Forrest B., Shelton, Philip C., Gilbert, Karl T.	1966	Birds of Isle Royale in Lake Superior; special scientific report -- Wildlife No 94	ISRO
	This report constitutes an annotated list of 197 species of birds reported from Isle Royale National Park, including some 200 islets and rock outcrops. Bird distribution and habitats are described, along with geography and vegetation; 62 species are known to have bred at least once, 26 are thought to be breeders, and the rest are migrants.			
157	Krefting, Laurits W., Shields, T. S.	1951	Observations on the birds of Isle Royale National Park, May 16 - June 4, 1950	ISRO
	no abstract available			
158	Krumenaker, Robert J.	1988	Letter to Dr. James W Grier, leader, northern states bald eagle recovery team, zoology department, North Dakota State University, Fargo, ND	ISRO
	Presents information on bald eagle productivity on Isle Royale National Park for the period 1983-1990.			

159	Krumenaker, Robert J.	1990	Letter to Dr. James W Grier, leader, northern states bald eagle recovery team, zoology department, North Dakota State University, Fargo, ND	ISRO
	Presents information on bald eagle productivity on Isle Royale National Park for the period 1984-1990.			
160	Kurita, H., Ludwig, James P.	1987	Results of the 1987 Michigan colonial waterbird monitoring project on Caspian terns and double-crested cormorants: egg incubation and field studies of colony productivity, embryologic mortality and deformities	ISRO
	no abstract available			
161	Larson, Keren	1989	Contaminants in Minnesota wildlife, 1989-1991 study	VOYA
	Outline of a study to be conducted statewide (Minnesota) on various species of birds for detection of PCBs, and heavy metals. Includes a schedule of proposed sampling. No results included - currently no final report of the findings.			
162	Lavalley, Steven	1987	Site evaluation for reintroducing peregrine falcons in Michigan's Upper Peninsula	PIRO
	Suitable habitat for the peregrine falcon (*Falco peregrinus*) is identified in the Upper Peninsula of Michigan. Their decline in population due to organochloride pesticide contamination has prompted efforts to reintroduce the bird. Densities of prey (songbirds), contaminant levels in potential prey species, and presence of its competitor (great horned owl) were studied at six sites identified as having a high potential for successful nesting, one of which is along the cliffs of Pictured Rocks National Lakeshore, MI. Maps indicating suitable habitat are provided. Appendices list prey species utilized by peregrine falcons and bird species present at the six sites. A reintroduction timetable is given.			
163	Lee, Forrest B., Krefting, Laurits W.	1948	Progress report - observations on the bird life of Isle Royale National Park	ISRO
	Observations of birds during at 26 day period in May 1948 with an attempt to study the bird life in relation to habitat. Lists observations by species with numbers of birds observed at each site. Includes a brief description of the habitats used in detailing the bird's observation sites and enumerates species of bird observed in each habitat. Photographs are of nesting sites and nesting habitats for herring gulls, woodcock, and photograph of a blue goose, a sharp-tailed grouse, a bald eagle nest, an osprey nest and a photo of each habitat type described. Six pages of Tables are included; Three of the pages are a summary of observations listing species observed, date first seen, total number of observations and their location; the other three pages list the species of birds observed in each of thirteen different habitats.			
164	Ludwig, James P.	1962	A survey of the gull and tern populations of Lakes Huron, Michigan and Superior; Jack-Pine Warbler	ISRO
	no abstract available			
165	Ludwig, James P.	1974	Recent changes in the ring-billed gull population and biology in the Laurentian Great Lakes; The Auk	ISRO
	Describes events and conditions that contributed to the increase in ring-billed gull populations in the Great Lakes following World War II.			
166	Lupient, Mary	1962	Nesting season, Western Great Lakes region; Audubon field notes	PIRO
	no abstract available			
167	Madsen, Carl R., Sheldrake, Thomas J. (Editors)	1979	Bald eagle production in the Great Lakes states 1973-1979	ISRO
	Presents information on nesting, breeding population, breeding success of the bald eagle population in the Great Lake states through aerial surveys.			
168	Maercklein, Robin	1980	A guide to the birds of Apostle Islands National Lakeshore	APIS
	This volume is a guide to the birds of Apostle Islands National Lakeshore. A narrative describes habitats, spring and fall migration, and unique aspects of Lake Superior. A checklist of bird is also included.			

169	Maercklein, Robin	1999	Bird monitoring in the St. Croix National Scenic Riverway; The Passenger Pigeon	SACN
	The article describes various bird monitoring activities occurring in the St. Croix National Scenic River, emphasizing the breeding bird surveys. Particularly interesting trends are noted. The status of bird species of special concern at the park is also described.			
170	Maercklein, Robin.	1999	St Croix National Scenic Riverway bird checklist	SACN
	no abstract available			
171	Manbeck, Jo Baichly	no date	Bird populations of three forest stands, Oak Island, Apostle Islands National Lakeshore	APIS
	Breeding bird populations in three forest types on Oak Island were surveyed using the standard territorial mapping technique. A total of 17 bird species were found in all habitats combined.			
172	Martin, Christian J.	1988	Breeding populations of colonial waterbirds at Isle Royale National Park, Michigan in 1988	ISRO
	This paper presents the results of an inventory of herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*), great blue heron (*Ardea herodias*), and double-crested cormorant (*Phalacrocorax auritus*) breeding populations conducted at Isle Royale Michigan during 1988. This type of baseline population data is importance since changing colonial waterbird populations may indicate changes in ambient pollution levels. Included in this file are fourteen topographic maps showing locations of surveyed colonial waterbird colonies.			
173	Martin, Christian J.	1989	Additions to the bird fauna of Isle Royale National Park, Keweenaw County, Michigan; Jack-Pine Warbler	ISRO
	The purpose of this paper is to document species not previously recorded within the park, and to summarize important observations on previously reported species. The records are derived from a database of faunal observations maintained by the National Park Service, and encompass the period from April 1983 through January 1989.			
174	Martin, Christian J.	1989	Colonial waterbird report Isle Royale National Park resource management report 89-3	ISRO
	This paper presents the results of an inventory of herring gull, ring-billed gull, great blue heron, and double-crested cormorant breeding populations conducted at ISRO during 1988. Wildlife managers are placing an increased emphasis on the acquisition of this type of baseline population data since changing colonial waterbird population levels may indicate changes in ambient pollution levels.			
175	Matteson, Sumner W.	1982	1982 Survey of the common tern (*Stirna hirundo*), black tern (*Chlidonias niger*), double-crested cormorant (*Phalacrocorax auritus*), and piping plover (*Charadrius melodus*), along the Wisconsin shore of Lake Superior	APIS
	A total of 103 pairs of common terns nested at the Ashland pier colony in Chequamegon Bay in 1982; a maximum of 1.25 young per pair were produced. Ring-billed gulls pose a threat to the continued viability of the Ashland pier common tern colony. This year, 11 pairs nested at the colony sites. A total of 6 pairs of black terns nested at the southeast end of Lake Pacwawong on the Namekagon River in 1982. At Fish Creek Slough there were 6-7 nesting pairs, and at the Kakagon Slough there were 8 breeding pairs. A ground count of double-crested cormorants on Gull Island of the Apostle Islands revealed that 210 breeding pairs occupied cobble beach areas along the southwest portion of the island. One pair of piping plovers produced 4 young this season; as in past years this pair nested near the northeast tip of Chequamegon Point.			
176	Matteson, Sumner W.	1979	Status of breeding gulls and terns on the Wisconsin shore of Lake Superior in 1979	APIS
	In 1979, the Wisconsin shore of Lake Superior was surveyed from May 22 to June 6 and from July 2 to July 13, to determine changes in the status of gull and tern populations identified in a similar survey in 1974. A total of approximately 1060 pairs of herring gulls nested on the Wisconsin shore of Lake Superior in 1979--about a 5% increase in the population since 1974. Almost all colony locations used in 1974 were reused in 1979. Pairs were concentrated in 16 colonies, with all but 73 pairs nesting in the Apostle Islands. The largest colonies within the National Lakeshore at Gull, Eagle, and Otter Islands remained at almost their identical breeding numbers of 1974. The smaller colonies were not as consistently stable, perhaps because of physiographic changes to colony sites. The colony at the Ashland breakwater outside of the National Lakeshore in Chequamegon Bay showed the largest increase since 1974 with pairs nearly quadrupling.			

177	Mauser, David M.	1985	Invertebrates, aquatic plants and waterfowl broods on four selected wetlands in St. Croix County, Wisconsin	SACN
	Included here is a list of collected and observed species of invertebrates and aquatic plants on wetlands in a county adjacent to the lower St. Croix River. Reproductive success of waterfowl is correlated.			
178	Mayfield, Harold	1948	Fall migration, Ohio-Michigan Region; Audubon field notes	PIRO
	Citation only from Foster, Wm., 1975. Bird observations from Alger Co., MI.			
179	Mccreary, Otto	1909	The ecological distribution of the birds of Isle Royale, Lake Superior	ISRO
	Discusses the habits of the different birds and their relation to their environment on Isle Royale. Lists the species of birds found in each locality visited. Also describes bird nests found in different habitats and the species of bird building and/or occupying it. Lists waterbirds, shorebirds, swamp birds, birds of clearings or partial clearings, and forest birds.			
180	Mcginnis, Nancy P., Mccrimmon, Donald A. Jr.	1993	Heron rookery monitoring	SACN
	This file contains the colonial bird register retrieval manual for data users, blank data entry forms, and notes on the Riverway heron rookeries. Raw data for all known historic and current (1984) rookeries are provided for northwestern Wisconsin, which includes the St. Croix and Namekagon rivers. Also furnished is the Minnesota Department of Natural Resources general heron monitoring information.			
181	Messner, Clarence J.	1953	Notes on the raven in the Upper Peninsula of Michigan in 1949; Jack-Pine Warbler	PIRO
	no abstract available			
182	Meyer, Michael W., Andersen, David E., Warnke, Donald Keith, Karasov, William H., Dykstra, Cheryl J., Brander, Robert B., Van Stappen, Julie F.	1994	Factors controlling Great Lakes bald eagle productivity	APIS
	Bald eagles (*Haliaeetus leucocephalus*) nesting on Wisconsin's Lake Superior shoreline have significantly lower reproductive rates than those nesting in inland Wisconsin (more than 8 km from the Lakeshore). Factors which may explain the depressed productivity of Lake Superior eagles include environmental contamination, low food availability on Lake Superior, and harsher weather on Lake Superior. We conducted research projects at interior Wisconsin and Lake Superior shoreline bald eagle nest sites during the 1992-93 field seasons to assess the strength of relationship between these factors and reduced bald eagle productivity. Methods and research findings were incorporated and considered during development of the Great Lakes Bald Eagle Biosentinel Protocol. The Protocol is currently under consideration for adoption under the Great Lakes Water Quality Agreement by the U.S. and Canadian governments.			
183	Michigan Natural Features Inventory	1990	Alger County element list	PIRO
	The list includes federal and state listed species as well as plant communities and geological features of concern. All species, communities, and features either currently exist or historically existed in Alger County.			
184	Minnesota Department of Natural Resources	1990	Annual monitoring of eagle nests and colonial waterbird colonies	SACN
	Ongoing monitoring of eagle nests and colonial waterbirds by various researchers and staff of Minnesota Nongame Wildlife Program and National Park Service.			
185	Minnesota Department of Natural Resources	1964	Report on the fish and wildlife of the St Croix River between Stillwater and St Mary's Point	SACN
	Provides information on fish and other animals observed between these lower St. Croix towns, located in Minnesota. Outlines general plants species in the area.			

186	Mississippi National River and Recreational Area	1997	Needed studies	MISS
	Provides the ranking, as desired by the Park, for natural resource related studies on the Upper Mississippi River. The research will be produce by/for the Biological Resource Division of the U.S. Geological Survey, in La Crosse, Wisconsin. Eight projects were listed as having the highest importance to the Park. These included assessments of habitat and the food chain on migratory birds, a model of bird and vegetation communities, fish passage through locks and dams, improved channel maintenance for habitat, effect of navigation projects on fish, land use effects, and restoration issues. Supplied is the Upper Mississippi Science Center's "Five Year Plan."			
187	Mossman, Michael J.	1987	Report by a volunteer ecologist on Outer Island	APIS
	This report includes the results of an informal survey of birds, mammals, and herptiles of Outer Island conducted September 11-28, 1987. A list of birds is included.			
188	Mossman, Michael	1989	Bird life encountered during a canoe trip down the St. Croix River, 27 April - 4 May 1989	SACN
	The report consists of field notes that were recorded while canoeing down the St. Croix River from the Gordon Flowage to Hudson. Bird, mammal, and herptile species and general abundances were recorded. Maps of the route with Louisiana waterthrush and red-shouldered hawk sites marked are included.			
189	Mossman, Michael J.	1991	Breeding birds of the St. Croix River, Wisconsin and Minnesota; The Passenger Pigeon	SACN
	Bird species were recorded during a canoe trip along the St. Croix National Scenic River that began at the Gordon Flowage and ended in Hudson, WI. The general abundance of species and vegetation types of each stretch of the river were noted, as well. Other sources were used to complete the bird list included in the article.			
190	National Park Service	1998	Bird lists and observations	APIS
	This report is a loose leaf notebook containing bird lists and observations collected at various locations throughout the Lakeshore. Earliest lists date back to 1980.			
191	Natural Resource Management Staff	1995	Raptor sightings -- 1995: Isle Royale National Park	ISRO
	A list of sightings by date for osprey (*Pandion haliaetus*), merlin (*Falco columbarius*), broad-winged hawk (*Buteo platypterus*), northern goshawk (*Accipiter gentilis*), peregrine falcon (*Falco peregrinus*), bald eagle (*Haliaeetus leucocephalus*), eastern screech owl (*Otus asio*), great-horned owl (*Bubo virginianus*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), turkey vulture (*Carthartes aura*), golden eagle (*Aquila chrysaetos*), and American kestrel (*Falco sparverius*). The map in this file is a topographic map labeled "Raptor Nest Locations 1995" and has a note attached that says, “See 1995 Raptor Report (Appendix 6) (by Ted Gostomski) for Location-Number Identifiers".			
192	Niemi, Gerald T., Davis, T.E., Hofslund, P.B.	1979	Distribution and relationships of habitats and birds in The St Louis River estuary: Minnesota and Wisconsin	VOYA
	no abstract available			
193	Niemi, Gerald T., Lima, Ann, Hanowski, Joanne, Pfannmuller, Lee A.	1995	Recent trends of breeding birds in Minnesota and Minnesota forested regions; The Loon	VOYA
	"Trends over the past 28 years were examined for the Breeding Bird Survey (BBS) roadside routes sampled in Minnesota with a special emphasis of those routes sampled in the primary forested areas. For 117 species examined, 49 species showed no change in the state, 42 species have shown a significant increase, and 25 species have shown a significant decline."			
194	Nordquist, Gerda E.	1990	Faunal surveys along the St Croix River in Chisago and Washington Counties, Minnesota	SACN
	As part of a state-wide effort to identify rare natural communities and their component species, the Minnesota County Biological Survey has inventoried two counties adjacent to the St. Croix River. Surveys conducted in Chisago County, 1990 and Washington County, 1988, documented the occurrence of six bird and eight herptile species listed by the state as threatened or of special concern status. Selected habitats adjacent to the St. Croix River were censused for characteristic avian, mammalian and herptilian assemblages.			

195	Nordstrom, Lori, H.	1990	Assessment of habitat suitability for reestablishment of piping plovers in the Great Lakes National Lakeshores	SLBE
	Assesses the habitat suitability for the reestablishment of piping plovers (*Charadrius melodus*) to Apostle Islands (APIS), Pictured Rocks (PIRO), Sleeping Bear Dunes (SLBE), and Indiana Dunes (INDU) National Lakeshores. The criteria used to evaluate habitat suitability are as follows: beach width, gravel/driftwood cover, human recreational use, and potential nest predation. A site at SLBE and another at APIS seemed to have adequate physical characteristics to support or attract piping plover populations. The management (enhancing habitat, limiting human use, predator exclosures, etc.) of other sites could encourage the natural reestablishment of piping plovers. There is a map showing the distribution of the piping plover through North America, and maps showing the study sites.			
196	Nordstrom, Lori, H.	1990	Invertebrate availability at potential piping plover breeding sites in the Great Lakes National Lakeshores	SLBE
	Compared the food availability for potential piping plover (*Charadrius melodus*) reestablishment at sites in Apostle Islands (APIS), Pictured Rocks (PIRO), and Sleeping Bear Dunes (SLBE) National Lakeshores to the food availability at an occupied breeding site in North Dakota. Used sticky traps to collect invertebrates. The mean invertebrate biomass of two Great Lakes sites, one at SLBE and the other at APIS, were similar to that of the North Dakota site. Appendices listing invertebrate taxa collected at APIS, PIRO, SLBE, and the North Dakota site.			
197	Nordstrom, Lori H., Ryan, Mark R.	1987	Evaluation of piping plover habitat in the Great Lakes National Lakeshores (preliminary field report 1987)	INDU, PIRO, SLBE
	The report presents a preliminary investigation of the quality of piping plover (*Charadrius melodus*) nesting habitats within the National Lakeshores around Lake Michigan. An evaluation of the potential of unoccupied habitat for reestablishment of plover breeding populations is also provided, with a determination of the availability of food items at these sites as compared to known plover nesting sites. Potential nest predation pressure was evaluated at several sites, along with invertebrate sampling to determine food availability. Preliminary results are given for each site, and a map and tables of beach measurements are provided.			
198	Nordstrom, Lori H., Ryan, Mark R.	1988	Evaluation of piping plover habitat in the Great Lakes National Lakeshores	INDU
	This project was implemented to aid in the recovery of the piping plover (*Charadrius melodus*) at National Park Service lands near the Great Lakes. The quality of piping plover nesting habitat within the National Lakeshores is mapped, quantified, and evaluated. The potential of unoccupied habitat for reestablishment of plover breeding populations is also evaluated. The availability of food items at potential piping plover nesting habitats is also determined and compared with known plover nesting sites. Indiana Dunes was not extensively studied, and not considered good habitat.			
199	Northwoods Audubon Center	1984	Habitat and size of the LeConte's sparrow territory; The Loon	SACN
	Recording of size, placement of territories and habitat analysis of LeConte's sparrow at the Northwoods Audubon Center, Pine County, MN			
200	Nosek, J.A., Faber, R.A.; Weiner, J.G., Anderson, R.V., Mcconville, D.R.	1984	Polychlorinated biphenyls and organochlorine insecticides in great blue heron and great egret eggs from the Upper Mississippi River; contaminants in the Upper Mississippi River. Proceedings of the 15th annual meeting of the Mississippi River Research	MISS
	Document referenced from the website of the National Water Quality Assessment--Upper Mississippi Watershed. Contact the U.S. Geological Survey, Mounds View, Minnesota, for further details.			
201	Oelfke, Jack G.	1993	Raptor inventory report, 1992 update Isle Royale National Park resource management report 92-1	ISRO
	Limited monitoring of raptors was completed at Isle Royale in 1992. Bald eagles (*Haliaeetus leucocephalus*) produced young on three nests. One and perhaps, two, osprey (*Pandion haliaetus*) nests produced young. No monitoring was completed to determine peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), or northern goshawks (*Accipiter gentilis*). Three sightings were made of Golden Eagles (*Aquila chrysaetos*).			

202	Overlease, William	1993	A study of bird populations in Benzie County, Michigan during breeding season from Mid-June to the first week of July, 1968-1990	SLBE
	Bird populations (153 species identified) in Benzie County, Michigan between 1968 and 1990 were monitored by using 17 sample sites representing the major plant cover types of the county: northern hardwoods (7 sites), oak-pine forest (3), swamp forest (3), streamside habitat (2), open Lake Michigan sand dunes (1), and moist open meadow (1). The data was subjected to regression analysis and species with significant changes are presented in tables. Changing population trends were compared to the U.S. Fish and Wildlife Service "North American Breeding Bird Survey, 1966-1989" to compare local changes to possible regional trends. There is a vegetation map of Benzie County.			
203	Overlease, William, Overlease, Edith	1972	Checklist of nesting birds of Benzie County, Michigan	SLBE
	A list of the nesting birds in Benzie County, Michigan observed by the authors and a list of contributors. For each species listed, observed nesting and/or young and the abundance are listed.			
204	Overlease, William, Overlease, Edith	1973	Checklist of summer resident birds of Benzie County, Michigan, including breeding records and abundance	SLBE
	A list of the summer resident birds of Benzie County, Michigan observed by the authors and a list of contributors. For each species listed, the breeding records (nest, adult with young, and probable local nesting) and abundance records are listed. There is a map showing the location of Benzie County in Michigan.			
205	Overlease, William, Overlease, Edith	1982	Checklist of resident birds of Benzie County, Michigan (Northwestern Lower Peninsula Michigan) during height of breeding season (Mid June to End of the First Week of July) with summer nesting records and species abundance	SLBE
	A list of the birds observed in Benzie County, Michigan by the authors and a list of contributors. For each species listed, the breeding records (nest or young traveling with adults) and abundance records are listed.			
206	Patzoldt, Kenneth R.	1977	Tentative checklist of birds observed on Oak Island, May 25, 1977 to August 11, 1977	APIS
	This report includes a list of birds observed on Oak Island from May 25 through August 11, 1977.			
207	Payne, Robert B.	1983	A distributional checklist of the birds of Michigan; Miscellaneous Publication No 164	ISRO
	This checklist is a summary of the occurrence, breeding status, migration, and distribution of birds in Michigan. Includes birds sighted on Isle Royale.			
208	Peakall, D.B., Fox, Glen A.	1987	Toxicological investigations of pollutant-related effects in Great Lakes gulls; environmental health perspectives	ISRO
	no abstract available			
209	Peet, Max Minor	1909	Annotated list of the birds of Isle Royale, Michigan; IN: Adams, Charles C. (editor). 1909. An ecological survey of Isle Royale, Lake Superior Wynkoop, Hallenbeck, Crawford Company: Lansing, MI 468 p	ISRO
	A record of bird observations at Isle Royale during the months of July through September of 1905. The annotated list includes information on range, station (habitat bird was observed in), breeding status, and breeding notes. Includes sighting of sharp-tailed grouse.			
210	Peet, Max Minor	1909	The fall migration of birds at Washington Harbor, Isle Royale, in 1905	ISRO
	Lists species of birds seen at Washington Harbor during the fall migration period. Contains a listing of species seen each day during the month-long observation period. Instances of large bird waves arriving or departing the island are described along with the species of birds present and the weather conditions at the time. A section of this report discusses the relation of weather to migration, migration routes over the island, and perils of migration over Lake Superior.			

211	Pettingill, Olin Sewall, Jr.	1970	Philadelphia vireo breeding in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
212	Pfannmuller, Lee A., Niemi, Gerald T., Mladenoff, David L.	1993	Effects of change in the forest ecosystem on the biodiversity of Minnesota's northern forest birds	VOYA
	The Minnesota Forest Bird Diversity Initiative was launched in January of 1992 with the primary goal of relating habitat patterns and change to regional bird diversity. This report details progress made in the first two years of the project on the following objectives: 1) assessing historical forest bird population trends 2) developing a program to monitor and predict future bird population trends, 3) assess and predict the response of forest birds to changes in the regional forest landscape, and 4) developing management prescriptions to promote integrated resource management.			
213	Pfannmuller, Lee A., Niemi, Gerald T., Mladenoff, David L.	1995	Minnesota's forest bird diversity initiative	VOYA
	The Minnesota forest bird diversity initiative was designed as a long term project with the primary goal of relating habitat patterns and change to regional bird diversity and to develop landscape management tools to maintain Minnesota's rich diversity of forest birds. The project began in FY 92-93 (for report see NRBIB record # 1010). Major objectives for the FY 94-95 biennium were to: implement the monitoring program that began in FY 92, continue to assess the relationship of forest birds to landscape patterns and composition, and promote forest bird conservation and management. A total of 1,025 points were censused in 1993 and 1994. At present, most species are maintaining relatively stable populations with only slight annual variations. Detailed information on the progress of each aspect of this initiative is contained within this report. Study plots are in areas adjacent to Voyageurs National Park, with plots within Voyageurs National Park currently being established to be included in future censusing.			
214	Pirnie, Miles D.	1940	Vacation-time birds near Munising, Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
215	Pitcher, Emma B.	1986	Thirteen years on the beat; Indiana Audubon Quarterly	INDU
	Bird populations were observed with relation to plant succession after a fire at the Indiana Dunes National Lakeshore. The article is a personal summary of the author's observations during an Audubon Breeding Bird Census in the burned acreage southeast of Tremont. Observations on plant and animal species present from 1973-1985 are provided.			
216	Postupalsky, Sergej	1963	Michigan bald eagle survey, bulletin no. 4 nesting survey 1962	ISRO
	no abstract available			
217	Postupalsky, Sergej	1965	1965 Map of bald eagle and osprey nests	ISRO
	Map showing locations of bald eagle and osprey nests found on Isle Royale National Park in 1965. There is a second, larger topographic map in this file with mapped locations of bald eagle and osprey nests located on Isle Royale during the period 1962-1969.			
218	Postupalsky, Sergej	1966	1966 Map of bald eagle and osprey nests	ISRO
	Map showing locations of active and inactive bald eagle and osprey nests found on Isle Royale National Park in 1966.			
219	Postupalsky, Sergej	1967	Reproductive success and population trends in the bald eagle in Michigan	ISRO
	no abstract available			
220	Postupalsky, Sergej	1968	The status of the osprey in the north-central United States, 1967	ISRO
	Citation found in "Transactions of the North American Osprey Research Conference", 1972.			
221	Postupalsky, Sergej	1968	Michigan bald eagle and osprey survey; Jack-Pine Warbler	ISRO
	no abstract available			
222	Postupalsky, Sergej	1969	The status of osprey in Michigan in 1965; IN: J.J. Hickey, Ed; peregrine falcon populations: their biology and decline. University of Wisconsin Press, Madison, Milwaukee, London 596 p.	ISRO
	no abstract available			

223	Postupalsky, Sergej	1971	Letter to Mr. Robert W Robergs, acting superintendent, Isle Royale National Park	ISRO
	Observations of eagle and osprey activity on Isle Royale.			
224	Postupalsky, Sergej	1971	Letter of October 27, 1971 to the superintendent, Isle Royale National Park	ISRO
	Observations of bald eagle and osprey on Isle Royale.			
225	Postupalsky, Sergej	1972	Status of the osprey in Michigan; IN: transactions of the North American Osprey Research Conference, College of William and Mary, Williamsburg, Virginia, February 10-12, 1972	ISRO
	Michigan's osprey population was estimated at no more than 100 breeding pairs in 1971. During 1964-1965, osprey productivity was very low and the population was declining 15% per year. Since, 1967, productivity has improved, though this recovery was confined to osprey nesting in the interior of Michigan. Ospreys nesting near the Great Lakes continue to reproduce poorly.			
226	Postupalsky, Sergej	1983	Appendix D: techniques and terminology for surveys of nesting bald eagles; IN: J.W. Grier, J.B. Elder, F.J. Gramlich, N.F. Green, J.V. Kussman, J.E. Mathisen, and J.P. Mattson, Eds. Northern states bald eagle recovery plan. United States Fish and Wildlife Service, Denver, CO. 76 pp. plus appendices	ISRO
	no abstract available			
227	Reaman, Peter S., Mclean, Karrie, Evers, David Charles	1996	Shoreline survey of common loons, common mergansers, and red-breasted mergansers in Pictured Rocks National Lakeshore, summer 1995	PIRO
	Surveys of piscivorous (fish-eating) birds along the shoreline of Lake Superior and interior lakes at Pictured Rocks National Lakeshore, MI were conducted June 5-August 2, 1995. Observations of common loons, common mergansers, and red-breasted mergansers were made from boat, land, and airplane using binoculars and spotting telescopes. Inland lakes surveyed were Legion, Chapel, Upper Shoe, Lower Shoe, Section 36, Little Beaver, Beaver, Kingston, and Grand Sable Lakes. Date, time, sex, location, distance from shore, plumage, group size, and behavior (foraging, swimming, flying, preening, shallow diving, resting, calling, and exhibiting aggression) were recorded. Carcasses were collected for cause of death. Observations of common loons on Lake Superior were classified into 7 zones, whereas observations of common mergansers were categorized into 4 zones. Bird observations from 3 zones out from shore (<250 m, 250- 500 m, and >500 m) were compared among bird species and locations. Management recommendations are provided. A map illustrates boundaries of the Lake Superior observation zones.			
228	Redig, Patrick T., Tordoff, Harrison B.	1987	Midwestern and Great Lakes Region efforts towards peregrine falcon restoration 1987	ISRO
	Efforts to restore the peregrine falcon to the Upper Midwest began in 1982. This report summarizes activities in the Upper Midwest region peregrine falcon restoration project during 1987. Pages 58-65 reports on the hacking of peregrine falcons at Isle Royale National Park.			
229	Redig, Patrick T., Tordoff, Harrison B.	1992	Midwest peregrine falcon restoration, 1991 report	ISRO
	A summary report of the tenth year of restoration of the peregrine falcon (*Falco peregrinus*) in the Upper Midwest. Includes reports of Birds hacked on Isle Royale in 1990. Reports on peregrines released at the Feldtmann Ridge hack site on Isle Royale in 1991. Reports on mortality and non-fatal injuries to released peregrine falcons. Reports on nesting attempts by hacked birds.			

230	Reiser, M. Hildegard	1988	Effects of regulated lake levels on the reproductive success, distribution and abundance of the aquatic bird community in Voyageurs National Park, Minnesota	VOYA
	The effects of regulated lake levels on the reproductive success, distribution and abundance of the aquatic and marsh bird community were studied in Voyageurs National Park. Regulation has caused less than natural (Rainy Lake), and greater than natural fluctuations in lake levels (Namakan Reservoir lakes); in addition, there are 26 small interior lakes which fluctuate naturally. Park lake designation (by water levels) exerted a significant negative influence on the reproductive success of the common loon with Rainy Lake having a greater success rate than the Namakan Reservoir lakes. The greatest nest loss on regulated lakes was due to rising water levels for red-necked grebe nests, and the common loon. Lake-level change was not significant in explaining percentages of flooded-out nests for the other marsh nesting birds. A modified lake regulation regime is proposed which should enhance the reproductive success of the aquatic avifauna community in Voyageurs National Park and thus increase park visitors' opportunity to enjoy the bird life.			
231	Robbins, Samuel D.	1961	Shorebirds in St. Croix County; The Passenger Pigeon	SACN
	Includes counts of shorebirds by species			
232	Robbins, Samuel D.	1968	Fall migration, Western Great Lakes region; Audubon field notes	PIRO
	Citation only from Foster, Wm., 1975. Bird observations from Alger Co., MI.			
233	Romanski, Mark C.	2002	Common loon, songbird, raptor and anuran surveys: A taste of Isle Royale National Park's monitoring program; Western Great Lakes research conference	ISRO
	The abstract discusses the various monitoring programs occurring at Isle Royale National Park. The common loon survey was initiated in 1990 to determine the reasons for low productivity. Isle Royale also has a breeding bird survey conducted since 1994. In 1984, a raptor survey monitoring bald eagles and osprey was begun to determine the effects DDT has had on the population. Finally, a frog and toad call survey was commenced in 1996 to determine the reasons for population fluctuations.			
234	Scharf, William C.	no date	Nesting and migration areas of birds of the US Great Lakes (30 April to 25 August 1976); US Fish Wildlife Service	ISRO
	no abstract available			
235	Schroeder, Alan B.	1969	Some notes on the occurrence of the Harris' sparrow in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
236	Shelton, Napier	1972	Notes on Isle Royale Birds: September 9-16, 1971 and June 13-August 16, 1972	ISRO
	A listing of the birds seen during the time periods listed above with notes added where they supplement or contradict statements in "The Vertebrates of Isle Royale National Park" by Robert G. Johnsson and Philip C. Shelton, 1965 or "Birds of Isle Royale in Lake Superior" by Krefting, Lee, Shelton, and Gilber, 1966.			
237	Shelton, Philip C.	1960	Field notes on Isle Royale birds	ISRO
	no abstract available			
238	Shevlin, Charles E.	1948	Report from superintendent of Isle Royale National Park to regional director, region 2, National Park Service	ISRO
	Reports on the status of wildlife and measures undertaken to protect and manage the wildlife resource. Reports on moose, beaver, coyote, snowshoe hare, browse utilization survey, birds, yellow perch, and lake trout.			
239	Shugart, G.W., Scharf, William C.	1983	Common terns in the Northern Great lakes: current status and population trends; Journal of Field Ornithology	ISRO
	no abstract available			
240	Shugart, G.W., Scharf, William C., Cuthbert, Francesca J.	1979	Status and reproductive success of the Caspian tern (*Sterna caspia*) in the US Great Lakes; proceedings of the colonial waterbird conference, 1978	ISRO
	no abstract available			

241	Smith, Douglas W.	no date	Bird observation records	VOYA
	Observation records for two bird species (Wilsons Phalarope and Dowitcher) sighted by Voyageurs National Park researcher Doug Smith in 1987.			
242	St. Croix National Scenic Riverway	1981	American white pelican species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1979 to 1981. White pelicans (*Pelecanus erythrorhynchus*) are a fairly common species as migrants along the Riverway, though listed as special concern in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
243	St. Croix National Scenic Riverway	1981	Bewick's wren species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made in 1981. Bewick's wren (*Thryomanes bewickii*) is a fairly common species along the Riverway, found migrating and nesting along the lower river. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
244	St. Croix National Scenic Riverway	1981	Cerulean warbler species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1968 to 1981. The Cerulean warbler (*Dendroica cerulea*) is a fairly common species found along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
245	St. Croix National Scenic Riverway	1981	Common tern species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made in 1981. Common terns (*Sterna hirundo*) are a somewhat common species along the Riverway, seen migrating along the lower river. They nest using sandy island beach areas, and summer birds have been found on the river. Common terns are listed as endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
246	St. Croix National Scenic Riverway	1981	Double-crested cormorant species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1980 to 1989. Double-crested cormorants (*Phalocrocoras auritus*) are a somewhat common species as migrants along the Riverway, though listed as endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
247	St. Croix National Scenic Riverway	1981	Forster's tern species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made in 1981. Forster's terns (*Sterna forsteri*) are a somewhat rare species along the Riverway. Commonly seen migrating along the lower river, there may be nesting terns in wetlands areas, as summer birds have been found. It is listed as endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
248	St. Croix National Scenic Riverway	1981	Hooded warbler species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1962 to 1981. The hooded warbler (*Wilsonia citrina*) is an uncommon species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
249	St. Croix National Scenic Riverway	1981	Kentucky warbler species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1963 to 1981. Kentucky warblers (*Oporornis formosus*) are a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			

250	St. Croix National Scenic Riverway	1981	Loggerhead shrike species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1919 to 1981. Loggerhead shrikes (*Lanius ludoviciamus*) are a rare and declining species along the Riverway and considered threatened in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
251	St. Croix National Scenic Riverway	1981	Yellow-crowned night heron species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1963 to 1981. Yellow-crowned night herons (*Nycticorax violaceus*) are a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
252	St. Croix National Scenic Riverway	1987	Yellow rail species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1987. The yellow rail (*Coturnicops noveboracensis*) is a species of special concern in Minnesota and found along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
253	St. Croix National Scenic Riverway	1987	Acadian flycatcher species location summary	SACN
	Acadian flycatcher species location summary for the St. Croix Riverway. Supplied is a data sheet on species location along the Riverway, from observations made from 1963 to 1987. The Acadian flycatcher (*Empidonax virescens*) is considered rare along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
254	St. Croix National Scenic Riverway	1987	Henslow's sparrow species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1987. Henslow's sparrow (*Ammodramus henslowii*) is a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included is report section relating to this bird (biology, ecology, etc.). An element stewardship abstract for the Nature Conservancy is furnished.			
255	St. Croix National Scenic Riverway	1987	American swallow-tailed kite species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1966 to 1987. Swallow-tailed kites (*Elanoides forticatus*) are considered accidental along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
256	St. Croix National Scenic Riverway	1987	Arctic peregrine falcon species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made in 1987. Arctic peregrine falcons (*Falco peregrinus tundrius*) are considered accidental along the Riverway, though they may be found during migration. The summary is not specific. Included are sections of articles relating to this bird (biology, ecology, etc.).			
257	St. Croix National Scenic Riverway	1987	Sandhill crane species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1903 to 1987. Sandhill cranes (*Grus canadensis*) are a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
258	St. Croix National Scenic Riverway	1987	Short-eared owl species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1987. The short-eared owl (*Asio flammeus pontoppidan*) is a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			

259	St. Croix National Scenic Riverway	1987	Upland sandpiper species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1987. The upland sandpiper (*Bartramia longicauda*) is a rare species along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.). Also included is the Nature Conservancy's Element Stewardship Abstract for this species.			
260	St. Croix National Scenic Riverway	1988	American peregrine falcon species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1988. Peregrine falcons (*Falco peregrinus*) are considered very rare along the Riverway, although one or two nesting pairs are found on the lower river. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
261	St. Croix National Scenic Riverway	1989	American bittern species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. The American bittern (*Botaurus lentiginosus*) is found along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
262	St. Croix National Scenic Riverway	1989	Bald eagle nesting survey - 1989	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forward to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Furnished here are Wisconsin breeding surveys for 1989, from the western and northwestern areas of the state.			
263	St. Croix National Scenic Riverway	1989	Caspian tern species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. Caspian terns (*Sterna caspia*) are a rare species along the Riverway. Possibly nesting in backwater areas on the river, it is listed as endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
264	St. Croix National Scenic Riverway	1989	Great egret species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway from observations made from 1980 to 1989. Great egrets (*Casmerodius albus*) are less common along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.).			
265	St. Croix National Scenic Riverway	1989	Historic bald eagle nesting sites	SACN
	Collected here is site specific data on eagle/osprey nests found along the Riverway. The information is from both Minnesota and Wisconsin Department of Natural Resources, and from Park sources. Current in 1989, the data includes active, inactive, and damaged or destroyed nests that had been surveyed in the past. Additional memos discuss conflicting data on several site locations and the attempts to clarify them.			
266	St. Croix National Scenic Riverway	1989	Horned grebe species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1980 to 1989. The horned grebe (*Podiceps auriitus*) is a somewhat common species along the Riverway, though listed as special concern in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			

267	St. Croix National Scenic Riverway	1989	Louisiana waterthrush species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1927 to 1989. The Louisiana waterthrush (*Seiurus motacilla*) is a somewhat rare species along the Riverway. Occasionally found nesting on the lower river, it is listed as special concerned in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
268	St. Croix National Scenic Riverway	1989	Red-necked grebe species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. The red-necked grebe (*Podiceps grisegena*) is a somewhat rare species along the Riverway. Usually found during migration, it is listed as threatened in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), and relating to the Riverway.			
269	St. Croix National Scenic Riverway	1989	Red shouldered hawk species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. The red shouldered hawk (*Buteo lineatus*) is fairly common along the Riverway. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.). Maps of finds from an 1989 Wisconsin survey are provided.			
270	St. Croix National Scenic Riverway	1990	General bald eagle nesting survey data	SACN
	This is a collection of survey information prior to 1990, relating to the Riverway. Included are aerial survey plans, midwinter Wisconsin surveying 1979 to 1990, the Wisconsin breeding survey from 1986, and notes from an eagle management meeting for the Mississippi and St. Croix rivers in 1990.			
271	St. Croix National Scenic Riverway	1990	Osprey species location summary for the St. Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1963 to 1981. Ospreys (*Pandion haliaetus*) are a fairly common species along the Riverway, though listed as special concern in Minnesota and Endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this bird (biology, ecology, etc.), management notes, and maps of nest sites along the Riverway.			
272	St. Croix National Scenic Riverway	1990	Bald eagle nesting survey - 1990	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forward to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Also provided is a Minnesota eagle survey for the year, a Riverway nest history by site, and new nests found during the season.			
273	St. Croix National Scenic Riverway	1991	Bald eagle nesting survey - 1991	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forward to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Also furnished are reports on winter roosts found in the upper Mississippi watershed, Wisconsin Department of Natural Resources eagle/osprey current surveys, and blood collection results from nestling eagles in the Great Lakes region.			
274	St. Croix National Scenic Riverway	1992	Bald eagle nesting survey - 1992	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forward to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Also furnished are the minutes of the Wisconsin bald eagle/osprey recovery team meeting (with the results of a boating/osprey affects study), the Wisconsin bald eagle and osprey survey for 1992, and the annual Minnesota bald eagle report.			

275	St. Croix National Scenic Riverway	1992	Bald eagle (*Haliaeetus leucocephalus*)	SACN
	This collection of information concerns bald eagles both generally and along the Riverway. An incomplete location summary for 1981 to 1989 is furnished, along with sections of articles written during the 1980s about eagles along the St. Croix. Also provided are discussions about human disturbance of breeding eagles and survey techniques and results. There are several guidelines for management of eagles, including winter activities, habitat, private landowners, U.S. Fish and Wildlife goals, and information on eagles from a Minnesota state park located along the St. Croix. The Northern States Bald Eagle Recovery Plan is included along with additional osprey nesting information in Wisconsin.			
276	St. Croix National Scenic Riverway	1993	Bald eagle nesting survey - 1993	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forward to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Some osprey nesting data is presented, along with the annual Wisconsin bald eagle and osprey surveys.			
277	St. Croix National Scenic Riverway	1994	Bald eagle nest - management needs on the Lower St Croix National Scenic Riverway	SACN
	These series of notes and memos concern a bald eagles nest found during the spring of 1994. A new nest, it was built within 300 feet of a National Park Service camp site. The discussions revolve around campsite closure and the quality of protection needed. Other eagle nests on the lower fifty mile stretch of the St. Croix are mentioned.			
278	St. Croix National Scenic Riverway	1994	Bald eagle nesting survey - 1994	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forwarded to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Also furnished is a U.S. Fish and Wildlife press release on eagle recovery (including the Riverway), data on bald eagle poisonings in northwestern Wisconsin, and the annual Minnesota bald eagle report.			
279	St. Croix National Scenic Riverway	1995	Bald eagle nesting survey - 1995	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forwarded to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. Included here is the Minnesota Department of Natural Resources annual bald eagle report.			
280	St. Croix National Scenic Riverway	1996	Bald eagle nesting survey - 1996	SACN
	Contained in this file is activity and productivity related to eagle nesting along the Riverway. This information was forwarded to the Minnesota Department of Natural Resources for coordination of activities. Nest locations and general site maps are included with various census data on adult, juvenile, and nestling eagles. A summary of eagle survey activities from 1989 to 1996 can be found here.			
281	St. Croix National Scenic Riverway	1996	Species list: birds	SACN
	Several checklists make up this file on birds along the Riverway. Lists are broken into whole river, district locations, and taxonomy. Included is a text report (see Faanes) containing general information. Also provided are Christmas bird counts from 1989 to 1994 for the St. Paul suburban region. This includes the St. Croix Riverway from Stillwater to Marine on St. Croix.			
282	St. Croix National Scenic Riverway	1997	Quadrangle maps with bald eagle nest	SACN
	These maps are Xeroxed sections of quadrangle (quad) maps with eagles' nest location included where they exist. The Riverway averages around two dozen active nests; presented here are maps of the entire Riverway, broken into the St. Croix and Namekagon. This information is contained in a database to assist in planning annual aerial surveys.			

283	Stauber, Erik	1963	The birds of prey on Isle Royale	ISRO
	A survey of the birds of prey on Isle Royale National Park was begun in 1963. Thirteen species were verified and varying observations concerning breeding, hunting, occurrence, and population were made. Species observed included bald eagle (*Haliaetus leucocephalus*), osprey (*Pandion haliaetus carolinensis*), broadwinged hawk (*Buteo platypterus*), red-tailed hawk (*buteo borealis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter velox*), goshawk (*Accipiter atricapillus*), merlin (*Falco columbarius*), kestrel (*Falco sparverius*), peregrine falcon (*Falco peregrinus*), great horned owl (*Asio magellanius occidentalis*), short-eared owl (*Asio flammeus*), and harrier marsh hawk. Besides the study of the birds of prey, observations of wolf, moose, and ravens were made and the most outstanding observations were included in this report. Maps included show location of nesting sites.			
284	Stauber, Erik	1964	Birds of prey on Isle Royale National Park II	ISRO
	Reports on the second year of a study to gain an understanding of the role of predatory birds in the ecology of Isle Royale National Park. Most of the work was done from the ground by hiking in to different areas to locate nest sites which were then observed to discover the type of prey taken by adult birds. When possible it was attempted to give an estimate of the density and distribution of the birds of prey. Species observed included bald eagle (*Haliaetus leucocephalus*), osprey (*Pandion haliaetus carolinensis*), broad-winged hawk (*Buteu platypterus platypterus*), red-tailed hawk (*Buteo janaicensis*), goshawk (*Accipiter gentilis atricapillus*), Cooper’s hawk (*Accipiter cooperii*), merlin (*Falco columbarius*), kestrel (*Falco sparverius*), peregrine falcon (*Falco peregrinus*), and long-eared owl (*Asio otus wilsonianus*). Other species reported during the study include the raven, beaver, moose and wolf.			
285	Stevens, William, Malone, John H.	1875	Journal of light-house station at Menagerie Island, Isle Royale, Siskowit Bay	ISRO
	A good source on light station routine. Contains details concerning commercial fishing. Contains references to bird sightings on Isle Royale, June 12, 1884 to September 24, 1893.			
286	Tans, William	1979	Wisconsin Scientific and Natural Area reports	SACN
	Described here are the six Scientific and Natural Areas within the Park boundaries. Each area is provided a report with the name, a legal description, access points, overview of the landform, general flora and specific plant inventory, and management history and plans. A map and breeding bird survey are also included.			
287	Temple, Stanley A., Harris, James T.	1985	Birds of the Apostle Islands	APIS
	This booklet provides a description of the Apostle Islands avian habitats, bird migration, breeding birds, winter birds, and an annotated list of birds.			
288	Tester, John R.	no date	Changes in daily activity rhythms in some free-ranging animals in Minnesota; Canadian Field Naturalist	SACN
	Discusses seasonal change in daily rhythms of gray squirrels, red fox, muskrats, ruffed grouse, and barred owls, and compares findings to those for captive animals. Some data collected in St. Croix watershed area.			
289	Thompson, F.R., Lewis, S.J., Green, J., Ewert, D.	1993	Status of neotropical migrant landbirds in the Midwest: identifying species of management concern; IN: D.M. Finch and P.W. Stangel, eds. Status and management of neotropical migratory birds United States Forest Service General Technical Report RM-229 Rocky Mountain Forest and Range Experiment Station: Fort Collins, CO 422 p.	ISRO
	no abstract available			
290	Tordoff, H.B.	1994	Nesting outcome for individually identified Peregrine Falcons in the Midwest, 1987-1993	SACN
	Listing of peregrine nestings in the area of the University of Minnesota.			
291	Turner, Robert E.	1979	White pelicans migrating up the St Croix River; The Loon	SACN
	The bird report describes the sighting of about 60 white pelicans along the St. Croix River at the dam in Taylor's Falls and St. Croix Falls.			

292	U.S. Department of Agriculture, Forest Service, Hiawatha National Forest	1989	Bird list for Hiawatha breeding bird survey	PIRO
	Participants in the Hiawatha Breeding Bird Survey have collected data on birds (visual and auditory identifications) annually since 1989 on the Hiawatha National Forest, MI. The survey is held on two consecutive mornings on the weekend following Memorial Day. A group of 3-5 observers listen and watch for 10 minute intervals at each of 10 plots along a transect. A group composed of different people identify birds the following day. A night transect on the Hiawatha National Forest is held once each year to observe owls and other nocturnal birds. In 1990 5 transects in Pictured Rocks National Lakeshore, MI (and some at the Seney National Wildlife Refuge) were added. Copies of the individual field data sheets from the plots in Pictured Rocks National Lakeshore are on file.The Hiawatha National Forest compiles and reports results from all plots on the breeding bird survey into one checklist every year. Those from 1993 and 1994 are on file at Pictured Rocks National Lakeshore. All other data, both in raw form and compiled lists are available from the Wildlife Biologist, Munising District, Hiawatha National Forest.			
293	U. S. Department Of The Interior, Fish And Wildlife Service	1979	Bird banding records pertaining to the Apostle Islands through September 1, 1978	APIS
	The report includes a computer printout of bird banding records for Apostle Islands National Lakeshore to 1979.			
294	U.S. Department Of The Interior, Fish And Wildlife Service	1987	Revised peregrine falcon, eastern population recovery plan	ISRO
	This plan deals with the restoration of the peregrine falcon in the eastern United States. The objectives are to outline those actions which are essential to the recovery of the peregrine falcon as a viable breeding species in its former eastern range and to report progress to date. The plan objective is to introduce and establish a new population through the release of captive-produced offspring whose subspecific parentage originated in geographical areas other than the eastern United States.			
295	University Of Minnesota	1994	Finder's list, Midwest peregrines, 1982-1993	SACN
	Lists peregrine falcon finds and provides a key to understanding the list.			
296	Unknown	no date	Bird sightings by unknown visitor to Voyageurs National Park, from 5/24/97 to 6/5/97	VOYA
	A park visitor staying at Woodenfrog campground recorded (in detail) all the birds she spotted during her week's stay, and on which days they were seen. The visitor’s credibility was not established.			
297	Unknown	no date	Scientific names of birds and mammals in Voyageurs National Park, Minnesota	VOYA
	List of birds and mammals found in Voyageurs National Park. Each species is listed by family, common name and scientific name. This is a table from an unknown source.			
298	Van Buskirk, Joseph Jr.	1984	Vocal mimicry of Nashville Warblers by Yellow-rumped Warblers; The Wilson Bulletin	ISRO
	Two censuses of the breeding bird population were done on each of 37 islands between 11 June and 12 July to assess the relationship between Yellow-rumped Warbler song characteristics and the abundance of singing Nashville Warblers in the immediate vicinity. Based on the censuses of these islands, 8% of Yellow-rumped warblers sing Nashville-type songs and their songs imitate the general structure of Nashville songs, but not of the configuration of song elements. Incorrect song acquisition may result from the exposure of juvenile Yellow-rumped Warblers to Nashville Warbler song during their first summer, when song learning has been shown to occur.			
299	Van Buskirk, Joseph Jr.	1985	Species-area relationship of birds on small islands at Isle Royale, Michigan; The Wilson Bulletin	ISRO
	This paper presents data on the number of bird species on 36 small islands at the northeast end of Isle Royale National Park, Michigan. The results show that the use of multiple islands by breeding birds complicates the interpretation of species-area data from very small islands. The number of breeding species increases as a function of island area throughout the range of island sizes present in the study. Results permit estimation of the minimum area requirements for several common species of birds at ISRO.			

300	Van Buskirk, Josh, Smith, David C.	1994	Birds of Northeastern Isle Royale National Park 1981-1994	ISRO
	This account is based on records that authors have maintained for bird sightings at ISRO from 1981 through 1994. They kept a daily list in which they recorded the numbers of individuals of each species seen or heard during the previous 24 hour period. The duration of coverage varied among years; coverage was most complete from late May through mid-July, for which period we have at least 10 years' data. Records include 194 species, of which 21 do not appear in Shelton's 1982 pamphlet on the Vertebrates of Isle Royale. The authors have indicated where breeding was confirmed in some species.			
301	Van Stappen, Julie F., Dallman, Matthew E.	1995	1995 Apostle Islands National Lakeshore breeding bird survey report	APIS
	Apostle Islands National Lakeshore's long-term monitoring program for breeding birds in 1995 had seventy-four species recorded at observation points. Stockton Island had the highest species diversity, followed by the Mainland Unit. Devils, Raspberry and Sand Islands had the highest number of birds per stop. Pine and dune habitats supported the highest species diversity, followed by boreal forest and aspen/birch habitats. Bog and pine habitats had the greatest number of birds per stop, followed by boreal forest. From 1991 to 1994, bird abundance steadily declined and then leveled off in 1995. With the exception of Devils and Oak Islands, bird abundance was lower in 1995 than the five-year mean. Aspen/birch forest and bogs were the only habitats that did not show a decline in 1995 from the five-year mean. Red-eyed vireo showed a large and steady decline from 1991-1994 and then recovered somewhat in 1995. The Apostle Islands may serve as a valuable "control" habitat in determining the impacts of forest fragmentation.			
302	Van Stappen, Julie F., Doolittle, Thomas C.	1991	1990 Migratory bird survey - resource management report	APIS
	During the spring and fall of 1990, migratory bird surveys were conducted on Outer and Long Islands. The surveys represent the beginning of a long-term program to monitor migratory birds in the Apostle Islands. We followed methods used by Harris in his 1977, 1978, and 1980 surveys of migratory birds in the Apostle Islands. Due to the absence of singing males, only observation sites were used during the fall. On Outer Island bird composition was strongly dominated by passerines (80%). The raptor component was dominated by broad-winged hawks. On Long Island bird composition on Long Island was dominated by passerines; however, numbers of seabirds and waterfowl were also high. The fall migration on Outer Island was exceptional; 140,912 birds (107 species) were counted, dominated by passerines (98%). The majority of raptors were falcons--105 merlins and 66 peregrine falcons. The fall migration on Long Island was similar in volume to the spring migration: 11,787 birds (93 species) were counted. The composition on Long Island was waterfowl (66%), passerines (22%), and shorebirds (8%).			
303	Van Stappen, Julie F., Doolittle, Thomas C.J.	1993	1992 Breeding bird survey - Apostle Islands National Lakeshore; The Passenger Pigeon	APIS
	During June 8-24, 1992, Apostle Islands National Lakeshore's annual breeding bird survey was conducted. This contributes information on the status and trends of breeding birds, largely neo-tropical migrants, in some of the few remnant old-growth habitats and large blocks of unbroken forests in the Upper Great Lakes.			
304	Van Stappen, Julie F., Doolittle, Thomas C.J.	1995	1993 Migratory bird survey - Apostle Islands National Lakeshore; The Passenger Pigeon	APIS
	During the fall of 1993, a migratory bird survey was conducted on the Outer Island sandspit as part of the park's long-term monitoring program. Previous migratory bird surveys were conducted during the fall of 1991 and 1990 and during the spring of 1990. During the 1990 and 1991 surveys, numbers of birds were counted through direct observations. In 1993, a temporary banding station was also established to capture, band, and color-mark raptors to assist in determining the significance of Outer Island to raptors, specifically falcons, as a stop over and migratory route. The total numbers of birds recorded in 1993 were higher than in 1991, but migratory flow was lower. During all fall surveys (1990, 1991 and 1993), bird composition was heavily dominated by passerines and the falcon migration was strong. Outer Island provides important habitat and its sandspit is a concentration point for migratory birds. The island appears to be regionally, if not nationally, significant for falcons.			
305	Van Stappen, Mike, O'Leary, Donna	1988	Great Lakes and Atlantic coast parks study piping plovers; highlights of natural resources management-1987	PIRO
	A 3 year study of the endangered piping plover (*Charadrius melodus*) began in May 1987 at Pictured Rocks National Lakeshore, MI, Apostle Islands National Lakeshore, WI, Sleeping Bear National Lakeshore, MI, and Indiana Dunes National Lakeshore, IN. The research will evaluate the suitability of presently unoccupied beaches as potential habitat for reestablishment of breeding populations.			

306	Van Zoeren, Tom	1982	Close Slough, a general study	SACN
	Study of a river channel area for potential development of an interpretive trail. Includes basic data on the flora, fauna and background of the site and management recommendations. Discusses the geology, flora, and fauna of the Close Slough area. While mammals and fish are briefly mentioned, birds and vegetation are covered more thoroughly. The area's management and future research recommendations are also included.			
307	various compilers	1981	Untitled: Great Blue Heron survey data	INDU
	These survey reports indicate number and location/habitat types for the Great Blue Herons located at the Indiana Dunes National Lakeshore's heron rookery. Survey results are reported for 1981, 1985, 1987, and 1990.			
308	various compilers	1994	Untitled: Owl survey data sheets	INDU
	Data sheets for Barred Owl, Great Horned Owl, and Screech Owl surveys from 1994-1997 indicate site locations, owls seen or heard, and environmental conditions.			
309	various compilers	1995	Untitled: bird project maps	INDU
	This document consists of copies of topographic maps made for 1995 bird projects. Maps indicate locations of survey transects for nest predation, and oak savanna bird surveys at Miller Woods, Inland Marsh, Marquette Trail, Howes Prairie, and Beverly Shores at the Indiana Dunes National Lakeshore. Surveys were also located at Tefft Savanna.			
310	various compilers	1995	Untitled: Bird point count data	INDU
	Point count data was collected between the years of 1995-1997 at the Indiana Dunes National Lakeshore. Birds were surveyed at various locations within the park, and identified on data sheets with other information, including bird's direction and distance from observer, and bird species.			
311	various compilers	no date	Untitled: Chicago Audubon Society bird survey data	INDU
	This document contains bird count data from various surveys since the 1970s. Species lists and accounts from specific bird surveys are included with maps of survey routes and other bird-related correspondence and general information.			
312	various compilers	1982	North Manitou Island - sightings and bandings	SLBE
	A list of all the bird species sighted and/or banded on North Manitou Island, Sleeping Bear Dunes National Lakeshore from 1982 to 1985.			
313	various compilers	1984	Mute swan management plan - November, 1984; natural and social sciences files	SLBE
	This file contains a report titled "Environmental Assessment and Mute Swan Management Plan" for Sleeping Bear Dunes National Lakeshore, Michigan. The report describes the problems associated with the non-native mute swan (*Cygnus slor*) and assesses management proposals for controlling their numbers. This file also contains recommendations and comments from other agencies and organizations.			
314	various compilers	1986	Piping plover action plan; natural and social sciences files	SLBE
	This file contains several revisions of "Piping Plover Action Plan - Sleeping Bear Dunes National Lakeshore." The action plan describes the history, habitat, and occurrence of the piping plover (*Charadrius melodus*) in Sleeping Bear Dunes National Lakeshore, Michigan. Several management alternatives are assessed.			
315	various compilers	no date	Birds; natural and social sciences files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with the observations and research of birds in Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information			
316	various compilers	no date	Feral swan management; natural and social sciences files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with mute swans (*Cygnus slor*) in Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: management recommendations, concerns and activities; observation reports; and, census reports.			

317	various compilers	no date	Piping Plover; natural and social sciences files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with the observations and research of piping plover (*Charadrius melodus*) in Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: a preliminary field report by Lori H. Nordstrom and Mark R. Ryan titled "Evaluation of Piping Plover Habitat in the Great Lakes National Lakeshores"; research proposals; observations (North Manitou Island); and, management recommendations.			
318	Voyageurs National Park	1996	1995 National Audubon Society Christmas bird count, International Falls, MN	VOYA
	List and numbers of each bird species seen by 37 participants in the annual Christmas Bird Count on December 16, 1995, in the International Falls area.			
319	Voyageurs National Park	1997	National Audubon Society Christmas bird count - International Falls, Minnesota	VOYA
	Collection of notes, newspaper articles, and data forms associated with the National Audubon Society's Annual Christmas Bird Count in International Falls, MN which Voyageurs National Park participates in. One report is included which details the numbers and species recorded during this one-day survey for the 1996 and 1997 counts in International Falls.			
320	Voyageurs National Park	no date	VOYA breeding bird point count data forms- 1996 raw data	VOYA
	Originals and duplicate copies of the raw data forms completed in 1996 and 1997 for the Voyageurs National Park Breeding Bird Point Count. Forms identify what species were heard or spotted, with what frequency and in what location (drawn in on quadrants).			
321	Walkinshaw, Lawrence H.	1956	Some bird observations in the Northern Peninsula of Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
322	Walkinshaw, Lawrence H.	1959	The prairie warbler in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
323	Walkinshaw, Lawrence H.	1966	Some observations of the least flycatcher in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
324	Walkinshaw, Lawrence H.	1967	The yellow-bellied flycatcher in Michigan; Jack-Pine Warbler	PIRO
	no abstract available			
325	Wallace, George J.	1965	Michigan bird survey, spring 1964; Jack-Pine Warbler	PIRO
	no abstract available			
326	Warner, Dwain W., Weisbrod, A. Richard	1985	Bird migration in the St. Croix River valley: Use of fragmented habitats by migratory birds	SACN
	The report describes the preliminary findings for a study on the use of habitat fragments by migrating birds at St. Croix National Scenic River. In 1984, research included (1) determining spring and fall migration patterns, (2) defining habitats used by migrating birds, (3) determining the breeding population of birds, and (4) describing the vegetation structures used by migrating birds.			
327	Webster, J.W., Maerckline, Robert A.	1983	Summary of breeding birds on the Namekagon River	SACN
	A list of birds observed in one day along the Namekagon River. The total number of species documented was sixty three.			
328	Weiland, Edwin C.	1964	Michigan bird survey, summer 1963; Jack-Pine Warbler	PIRO
	no abstract available			
329	Weiland, Edwin C.	1964	Michigan bird survey, winter 1963-64; Jack-Pine Warbler	PIRO
	no abstract available			

330	Weisbrod, A.R.	1991	Bird migration in the St Croix Valley: use of fragmented habitats by migrating birds	SACN
	Discusses 1984 field studies and findings and plans for 1985 research. Research conducted at Belwin Outdoor Education Lab, Afton, MN and at Sandrock Cliffs. Objectives to determine level of fragmentation in the natural habitats of the region and its effect on migratory birds in order to begin to construct a database on birds, migration, breeding bird species, and habitat preferences for the region. Discusses seasonal abundance of species, stopover site use, migratory routes, importance for habitat and species conservation efforts. During 1984, approximately 7500 migrating birds were captured in five habitat types. During 1991, researchers continue to analyze the mist-netting data base to understand and interpret neotropical bird migration in the St. Croix valley.			
331	Weseloh, D. Vaughn, Mineau, Pierre, Hallett, Douglas J.	1979	Organochlorine contaminants and trends in reproduction in Great Lakes herring gulls, 1974-1978; transactions of the North American Wildlife Conference	ISRO
	This paper describes trends of the major organochlorine residues found in Great Lakes herring gulls since 1974. Shows problem areas of contamination, the relationship of contaminants to reproductive success of the herring gulls in the Great Lakes Basin, and forecasts the future contamination levels and the effects of remedial action in the Great Lakes ecosystem.			
332	Wilmore, Sandra L., Russ, Michael	2000	Monitoring avian migrations, productivity, and survivorship in northwest Indiana, 1999-2000 - final report	INDU
	A bird banding and migration monitoring station was established at Miller Woods in Indiana Dunes National Lakeshore to fill in bird migration data gaps for the Great Lakes region. Seven mist nets were set up during the spring and fall, and ten nets were set up during the breeding season. Nets were placed in areas that were expected to capture a good representation of birds occupying the oak savanna habitat of Miller Woods. The Institute for Bird Populations' (IBP) bird processing protocols and data form were used.			
333	Winker, K., Warner, D.W., Weisbrod, A.R.	1991	Unprecedented stopover site fidelity in a Tennessee Warbler; The Wilson Bulletin	SACN
	A short article concerning three successive stopovers of an adult male Tennessee Warbler. The site was located in the St. Croix river valley.			
334	Winker, K., Warner, D.W., Weisbrod, A.R.	1992	Timing of songbird migration in the St Croix River Valley, Minnesota, 1984-1986; The loon	SACN
	The report discusses research conducted to determine the timing of migrating birds in the St. Croix River Valley. Migrating neotropical songbirds were captured during migration using mist nets. The birds were then measured, sexed, aged, weighed, examined for fat level and molt status, and banded. The distribution of birds through time is reported.			
335	Wisconsin Department Of Natural Resources	1983	Evaluations of waterfowl production areas in Wisconsin	SACN
	Evaluation of two waterfowl production areas in St. Croix and Polk Counties. Includes management recommendations.			
336	Wisconsin Department Of Natural Resources	1987	Duck and pheasant management in the pothole region of Wisconsin	SACN
	Details management of game bird species in the prairie pothole region of Wisconsin.			
337	Wisconsin Department Of Natural Resources	1990	Bird and animal monitoring activities at Baldwin, Wisconsin	SACN
	Variety of ongoing monitoring activities, including eagle surveys, woodcock surveys, winter bird surveys, breeding bird surveys (results reported to U.S. Fish and Wildlife Service as part of national survey efforts), pheasant counts, and winter counts of geese and other waterfowl (also part of Fish and Wildlife Service annual census. Territory includes St. Croix Islands area.			
338	Wisconsin Department Of Natural Resources	1990	Trumpeter swan ecology, restoration and habitat suitability	SACN
	Ongoing effort as part of Wisconsin DNR's long-term restoration program to develop a free-flying, breeding and migratory flock of at least 20 pairs of trumpeter swans (*Cygnus buccinator*). Current study objectives include efforts to define and identify suitable habitat for release of captive-raised swans; identify mute swan pairs for cross-fostering; determine the effectiveness of various restoration techniques and strategies in Wisconsin and elsewhere in establishing a self-sustaining, migratory and breeding population of trumpeter swans; and identify factors that limit or enhance the success of these techniques. Study is being conducted at Crex Meadows Wildlife Area in northwestern Wisconsin as part of a cooperative agreement between Wisconsin DNR and the University of Wisconsin-Madison, Department of Wildlife Ecology.			

339	Wisconsin Department Of Natural Resources	1991	Restoration of wetlands and uplands for pheasants, ducks and aquatic birds	SACN
	Long-term research (1982-90) concerning restoration of wetland and upland areas for ducks, pheasants and aquatic birds. Evaluation of management practices such as burning. Evaluation of lake treatments and water quality.			
340	Wisconsin Department Of Natural Resources	1991	Surveys of rare animals: Karner blue butterfly (*Lycaeides samuelis*) and Kirtland's warbler (*Dendroica kirtlandi*)	SACN
	Survey of Karner blue butterfly (on federal list of endangered species) along the lower reaches of the Riverway; survey of Kirtland's warbler will focus on the pine barrens bordering the upper Riverway.			
341	Wolinski, Richard A., Pike, Edward A.	1987	First sight record of Yellow-crowned Night-heron on North Manitou Island; Jack-Pine Warbler.	SLBE
	A brief, but detailed description of a Yellow-crowned Night-Heron (*Nyctanassa violacea*) sighting on North Manitou Island in Sleeping Bear Dunes National Lakeshore. The sighting was the first recorded of its kind on North Manitou Island.			
342	Wood, Norman A.	1905	Some new and rare bird records for Michigan; The Auk.	ISRO
	no abstract available			
343	Wood, Norman A.	1918	Notes on the birds of Alger County, Michigan; occasional papers of the Museum of Zoology, University of Michigan, No 50.	PIRO
	no abstract available			
344	Wood, Norman A.	1930	Some unusual bird records from Isle Royale, Michigan; The Auk.	ISRO
	no abstract available			
345	Wood, Norman A.	1951	The birds of Michigan	PIRO
	no abstract available			
346	Wood, Norman A., Peet, Max M., McCreary, Otto	1906	Annotated list of the birds of the Porcupine Mountains and Isle Royale, Michigan; IN: Adams, Charles C (editor). An ecological survey in Northern Michigan. A report from the University Museum, University of Michigan, published by the State Board of Geological Survey as part of the report for 1905.	ISRO
	Presents a listing of bird observations made in 1904 by the state natural history survey on Isle Royale and in the Porcupine Mountains. The Isle Royale report is p. 121-127 and lists 81 species observed between August 16, 1904 and September 5, 1904.			
347	Yancho, Steve	no date	8 mm Videotapes	SLBE
	This collection contains 7 videotapes that show and document resource management projects that occur in Sleeping Bear Dunes National Lakeshore, Michigan. The tapes are labeled for content and date recorded. They show: South Manitou Island fuel transfer (October 13, 1993); North Manitou Island (NMI) site investigation (June 9, 1993); NMI biobed (May and October, 1994); NMI sampling protocol for monitoring wells (August 24, 1994); NMI piping plover (*Charadrius melodus*) activity (June, 1993), and bald eagle (*Halaiietus leucociphalus*) nest and banding (June 25, 1993); Haswell dump (October, 1994); and, Casey's thermal desorbtion (no date listed).			
348	Zimmerman, Dale A., Van Tyne, Josselyn	1959	A distributional checklist of the birds of Michigan	ISRO
	A checklist of birds occurring and/or breeding in Michigan through 1958. Includes bird sightings from Isle Royale.			

FIRE

1	author unknown	no date	Fire management unit descriptions and prescriptions	INDU
	This document describes three fire management units for the Indiana Dunes National Lakeshore. Portions of fire management units are described by vegetation community type, and are divided into the savanna/prairie fire management unit, the dune forest unit, and the moraine forest unit. For each unit, there is a description of the location, dominant vegetation, fire behavior, and management goal. A table shows each fire management unit with its acreage, predominant vegetation, historic fire frequency, long range objective, and recommended fire frequency.			
2	author unknown	no date	Logging and the 1936 fire on Kabetogama Peninsula	VOYA
	This appears to be a manuscript written by a Voyageurs National Park staff member. It is a collection of narratives on various aspects of the history of the areas now Voyageurs National Park. It appears that much of the information is taken from oral interviews with local residents. Information on the 1936 fire on the Kabetogama Peninsula is within the first 10 pages of this document.			
3	author unknown	1935	Fire weather data	ISRO
	The boxes contain a variety of fire weather data from Isle Royale: Mott Island (1935-1982), Windigo (1935-1982), Feldtmann (1964-1980), Ishpeming (1962-1982), Camp Siskiwit (1935-1952), and Rock Harbor (1980-1982). They also contain hydrothermograph records, rain guage charts, winter study records from Rolf Peterson (1971-1981), NOAA Climatological Data (1965-1981), printouts from the computer runs of FIRDAT and NFDRS, and other weather observation reports.			
4	author unknown	1936	Fire atlas, National Park Service, Region 2, Isle Royale National Park	ISRO
	The atlas contains a variety of fire reports for this time period, including: 1. a small map labeled "Fire Occurrence Map 1936-1949" showing locations, dates, causes and classifications of fires; 2. a small map labeled "Fire Occurrence Map 1950-1959" showing locations, dates, causes and classifications; 3. a summary of Fire Reports (date started, name, location, cause, classification, elevation, elapsed time record, cost of suppression, area burned) for years 1931-1940; and Individual Forest Fire Report Summaries for individual years 1941 through 1955 (one for each year)(identification of fire, cause, behavior, elapsed time record, accessibility and man power, accomplishment, fire damage, suppression costs, remarks); 4. data sheets, one for each year 1941 to 1954, showing precipitation, visibility, relative humidity, fire danger class, fuel moisture percentage; and 5. a Fire Hazard Map (Fuel Type) of scale 1:63,360. The legend for the Fire Hazard Map is color coded to show areas of high, moderate, and low rate of spread and shaded to show high, moderate, and low resistance to control.			
5	author unknown	1936	The Isle Royale fire	ISRO
	The map is a 1935 Department of Conservation, Geological Survey Division map of Isle Royale, Keweenaw County, Michigan (Scale 1:63,360). Some one has hand-drawn the extent of the 1936 fires on this map. The map shows burned areas, controlled and patrolled lines, lines not worked where fire was apparently out, camps, and radio stations.			
6	author unknown	1936	Map of Isle Royale showing 1936 major forest fires	ISRO
	The map was traced from reduced U. S. Geological Survey Air Photo Base Maps, scale 1:63,360. It shows the extent of forest fires burning on Isle Royale in 1936.			
7	author unknown	no date	Fire atlas-Isle Royale National Park	ISRO
	This binder contains information on forest fires occurring on Isle Royale during the years 1950-1960. It includes a chart showing the Mott Island Burning Index (15 year average), a map showing fire occurrences in during the 1960s, and a map showing fire occurrence from 1936 to 1959.			
8	author unknown	1975	Thirty-seven year fire history	ISRO
	no abstract available			
9	author unknown	1976	Vegetation, site and fire relationships within the area of the Little Sioux fire, Northeastern Minnesota; Can J For Res	VOYA
	"The relationship of various features were examined in an area of northeastern Minnesota that burned in a forest fire in May, 1971. Maps based on fire intensity, cover types, soils and topography were randomly sampled with 34 comparisons s being made between pairs of classifications based on map characteristics. Fire intensity was most closely related to slope position." (excerpts from author's abstract)			

10	author unknown	1979	Early revegetation And nutrient dynamics following the 1971 Little Sioux forest fire in Northeastern Minnesota; Forest Science	VOYA
	Three virgin plant communities dominated by *Pinus banksiana* , three by *Populus-Betula* , and one mixed community were studied over five growing seasons after burning in the 1971 Little Sioux fire. By 1973 the nutrients in the aboveground vegetation and the 01 horizon of the forest floor were greater than the quantity estimated to have been mobilized by the fire.			
11	author unknown	1979	40 year fire history-Isle Royale National Park	ISRO
	The report lists the number of lighting and man-caused fires for the years 1939 through 1978. The enclosed map shows locations of each fire on Isle Royale.			
12	author unknown	1986	Vegetation/fire management plan: Pictured Rocks National Lakeshore	PIRO
	Vegetation/fire management objectives are defined and alternatives to achieving them are described. The environmental, ecological, aesthetic, historical/cultural, economic, and social impacts of each alternative are discussed, and the National Park Service preferred alternative is chosen. The document also contains descriptions of the biological and physical characteristics of the park, cultural resources in the area, and the land use of the surrounding public and private lands.			
13	author unknown	1991	Railroad-caused fires, Indiana Dunes National Lakeshore	INDU
	This document consists of summary pages listing the date, railroad, fire name, size, and overtime cost for railroad-caused fires at the Indiana Dunes National Lakeshore between 1991 and 1994. Individual fire record sheets for the same time period are also available, with each sheet including information on the fire attack, site data, prevention data, and statistical data.			
14	author unknown	1994	Resource management slides	INDU
	These slides document a variety of resource management activities, including Karner blue butterfly (Lycaeides melissa samuelis) activities, Midwest Steel Karner habitat, water quality, black locust removal, and a presentation on prescribed fire for Karner habitat restoration. There are pages describing the pictures in the first few rolls of film.			
15	author unknown	1994	Prescribed fire monitoring plan Indiana Dunes National Lakeshore	INDU
	(title self-explanatory)			
16	Agee, James K.; Cole, D.N., McCool, S.F., Borrie, W.T., O'Loughlin, J., compilers	2000	Wilderness fire science: a state of the knowledge review; Wilderness Ecosystems, Threats, and Management (Vol. 5); Wilderness Science in a Time of Change	APIS, ISRO, SLBE, VOYA
	Wilderness fire science has progressed since the last major review of the topic, but it was significantly affected by the large fire events of 1988. Strides have been made in both fire science and fire effects, and in the issues of scaling, yet much of the progress has not been specifically tied to wilderness areas or funding. &. Major challenges include better understanding of the regional context and function of wilderness areas, as well as understanding and incorporating fire patchiness, variability and synergistic disturbance factors into predictive models. If more precise models are to be applied accurately in wilderness, better weather databases are essential.			
17	Ahlgren, Clifford.E.; Kozlowski, T.T., editors	1974	Effects of fires on temperate forests: north central United States; Fire and Ecosystems; Physiological Ecology	APIS, GRPO, INDU, ISRO, LIBO, MISS, PIRO, SACN, SLBE, VOYA
	As a dramatic agent of change, wildfire has played a major role in shaping the vegetation of north central United States and adjacent central Canada for many centuries. Paper includes discussions of physical factors in ecological change, fire adaptation in pine species, post-fire development of other plant species, and interrelationships between vegetation height, percent cover, and number of species.			
18	Ahlgren, Clifford E.	1960	Some effects of fire on reproduction and growth of vegetation in northeastern Minnesota; Ecology	GRPO, ISRO, VOYA
	Fire as an important factor in determining the course of plant succession has been investigated by a number of workers. In the coniferous forests of the Lakes States, however, insufficient emphasis has been placed on the detailed study of fire as an ecological factor. This paper is an interim report on a long-range study of the effects of wild and prescribed fires in northeastern Minnesota.			
19	Albini, F.A.	1976	Estimating wildfire behavior and effects	VOYA
	This paper presents a brief survey of the research literature on wildfire behavior and effects and assembles formulae and graphical computation aids based on selected theoretical and empirical models. The uses of mathematical fire behavior models are discussed, and the general capabilities and limitations of currently available models are outlined.			

20	Alexander, M.E.	1987	Help with making crown fire hazard assessments; symposium and workshop on protecting people and homes from wildfire in the interior west	VOYA
	This paper offers some suggestions and field guides with respect to the operational application of C.E. Van Wagner's (1977. Can. J. For. Res. 7: 23-34) theory to calculate the threshold conditions for the start and spread of crown fires in conifer forests. Three categories of crowning are recognized (passive, active, and independent); they are determined by three crown fuel properties (live crown base height, foliar moisture content, and bulk density) and two characteristics of fire behavior (spread rate and surface intensity).			
21	Andrews, P.L., Bradshaw, L.S.	1990	RXWINDOW: defining windows of acceptable burning conditions based on desired fire behavior	VOYA
	The program RXWINDOW is intended to help fire managers develop prescription windows based on desired fire behavior. It is the fifth program in the BEHAVE fire behavior prediction and fuel modeling system. It reverses calculations found elsewhere in BEHAVE. In RXWINDOW, the user specifies acceptable fire behavior (rate of spread, flame length, intensity, scorch height, tree mortality) and the program determines the appropriate combinations of environmental conditions (fuel moisture and wind).			
22	Andrews, P.L., Rothermel, R.C.	1982	Charts for interpreting wildland fire behavior characteristics	VOYA
	The fire characteristics chart is proposed as a graphical method of presenting two primary characteristics of fire behavior - spread rate and intensity. Its primary use is communicating and interpreting either site-specific predictions of fire behavior or National Fire Danger Rating System (NFDRS) indexes and components. Rate of spread, heat per unit area, flame length, and fireline intensity, are plotted on a fire behavior chart. Spread component, energy release component, and burning index are plotted on an NFDRS chart. Specific examples illustrate potential application.			
23	Axtell, Craig C.	1981	Fire management plan	ISRO
	The report outlines the management decisions and activities necessary to retain the wilderness values of the area, to preserve the wildlife, flora, and basic resources in a primeval matter, in regard to wildfire activities. Natural fires will be permitted to run their course if they meet predetermined management criteria. All man-caused fires will be extinguished and prescribed burning will be utilized at the option of Park management.			
24	Axtell, Craig C.	1982	Individual fire report-Eagle Nest, Porter Island, Washington Creek	ISRO
	This is the original typewritten "Form DI-1201 (February 1973) United States Department of the Interior Individual Fire Report" for the Eagle Nest fire (#82001 A), Porter Island fire (#82002 A), and Washington Creek fire (#82003 A).			
25	Axtell, Craig C.	1984	Individual fire report-Huginnin Cove fire	ISRO
	This is the original typewritten "Form DI-1201 (February 1973) United States Department of the Interior Individual Fire Report" for the Huginnin Cove Fire, Fire Number 84-1-B.			
26	Axtell, Craig C.	1985	Fire management plan	ISRO
	The alternative chosen through environmental review states that "Natural fires will be permitted to run their course if they meet predetermined management criteria. All man-caused fires will be extinguished and prescribed burning will be utilized at the option of park management."			
27	Baker, William L.	1992	Effects of settlement and fire suppression on landscape structure; Ecology	APIS, GRPO, ISRO, VOYA
	Natural landscapes subject to disturbance have a patchy structure that is important to many species living in these landscapes. This structure may be modified when the disturbance regime is altered by either climatic change or human influences (e.g., fire suppression), yet little is know about how this structure will change. I used a GIS-based spatial model and data on historical changes in fire sizes and interval s to simulate the effects of settlement and fire suppression on the structure of the landscape in the Boundary Waters Canoe Area, Minnesota. Landscapes that have been altered by settlement and fire suppression cannot be restored using traditional methods of prescribed burning, which will simply produce further alteration. Causes of landscape change cannot be separated without control landscapes that lack prescribed burning, fire suppression, or other alterations of the natural fire regime.			

28	Baker, William L.	1993	Spatially heterogeneous multi-scale response of landscape to fire suppression; Oikos	APIS, GRPO, ISRO, PIRO, VOYA
	Large natural disturbances produce a patchy structure in landscapes. External changes, such as climatic change or the intentional suppression of disturbances, may alter this structure. Species sensitive to this structure may thus experience changes in available habitat, but species use the landscape at different spatial scales. Parks and wilderness areas with unadulterated disturbance regimes are essential if we are to understand how and why landscapes change and the role that this change plays in the population dynamics of species.			
29	Barney, R.J., Stocks, B.J.; Wein, R.W., MacLean, D.A.	1983	Fire frequencies during the suppression period; The role of fire in Northern Circumpolar Ecosystems; SCOPE 18	APIS, GRPO, ISRO, PIRO, VOYA
	Wildfires have been and currently are an important factor in the northern ecosystems of all circumpolar countries. Historical accounts of fires are general and often provide few quantitative data; therefore, we more recent data from the fire suppression period to draw conclusions about fire frequencies. In this chapter, data on the frequency of wildfires in northern Canada, Alaska, USSR, Sweden, and Finland are reviewed, and problems with the interpretation of fire frequency data are discussed. From the limited data which are available it appears that the patterns of fires at the northern latitudes are very similar to those observed in Alaska and Canada.			
30	Barrett, Linda R.	1995	A stump prairie landscape in Northern Michigan: soils, forest vegetation, logging, and fire	PIRO
	The long-term effects of logging practices in the 1880's on the soils and revegetation of the Kingston Plains in the Inland Buffer Zone of Pictured Rocks National Lakeshore, MI are examined. Specific site characteristics are considered to be integral to the effects of fire on a stump prairie. The relationship between fire, the lack of reforestation, and soil development is addressed. The nature of the landforms, the soils, and the pre-logging vegetation of the Kingston Plains is presented. Aerial photographs were used to compare the extent of reforestion in 1939, 1954, and 1986. Age of trees was determined. Species composition of the pre-disturbance forest was studied by analysis of the stumps and examination General Land Office (GLO) survey field notes and county records. Soil properties and classification were determined along with particle size, pH, organic carbon, aluminum, iron, and silica content were measured. Comparison of current forest species composition with that of the predisturbance forest is provided.			
31	Bergeron, Yves	1991	The influence of island and mainland lakeshore landscapes on boreal forest fire regimes; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	In order to characterize the fire regime of the southern boreal forest and to understand the way in which landscape and fire regime interact, a detailed study of fire history was undertaken in two adjacent contrasting landscapes in northern Quibec. The fire history for the islands of Lake Duparquet was reconstructed and compared to that of the surrounding lakeshore. We suggest that the fire regime in the boreal forest is controlled by long-term climate change at the regional scale, and by a strong interaction with landscape at the local scale, both components having a great impact on the distribution and the dynamics of boreal vegetation.			
32	Bergeron, Yves, Brisson, Jacques	1990	Fire regime in red pine stands at the northern limit of the species' range; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	In order to define more precisely the fire regime prevailing in red pine stands, and to evaluate its effect on the maintenance of marginal populations in the boreal forest, we documented the frequency, extent, and intensity of fires that affected red pine populations in northwest Quebec. We focused on two populations in Lake Duparquet, divided the islands into 5 X 5 m plots, and recorded topography, soil moisture, and vegetation for each plot. We mapped stems and noted fire scars, took core samples and stem cross-sections to determine the age of trees, and used fire scars, post-fire regeneration, surviving trees, and changes in growth rates as indicators of fire passage and intensity. Fire frequency was also estimated using fire history data from 13 other stands. The fire regime described for these insular stands at the limit of the species range is similar to that described for other parts of the range of red pine. We hypothesized that red pine is restricted to insular habitats at this northern limit of its range because of the particular fire regime that prevails there; the larger and more intense fire of the mainland here led to the elimination of the species.			
33	Bergeron, Yves., Gauthier, S., Kafka, V., Lefort, P., Lesieur, D.	2001	Natural fire frequency for the eastern Canadian boreal forest: consequences for sustainable forestry; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, VOYA
	Given that fire is the most important disturbance of the boreal forest, climatically induced changes in fire frequency can have important consequences on the resulting forest mosaic age-class distribution and composition. Using archives and dendroecological data we reconstructed the fire frequency in four large sectors along a transect from eastern Ontario to central Quebec. Results showed a dramatic decrease in fire frequency that began in the mid-19th century and has been accentuated during the 20th century. & The global warming that has been occurring since the end of the Little Ice Age (~1850) may have created a climate less prone to large forest fires in the eastern boreal forest of North America. & A longer fire cycle has important consequences for sustainable forest management of the boreal forest of eastern Canada.			

34	Bradley, A.F., Fischer, W.C., Noste, N.V.	1992	Fire ecology of the forest habitat types of eastern Idaho and western Wyoming	VOYA
	Provides information on fire as an ecological factor in the forest habitat types occurring in eastern Idaho and western Wyoming. Identifies Fire Groups based on fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.			
35	Bradley, A.F., Noste, N.V., Fischer, W.C.	1992	Fire ecology of forests and woodlands in Utah	VOYA
	Provides information on fire as an ecological factor in forest habitat types, and in pinyon-juniper woodland and oak-maple brushland communities occurring in Utah. Identifies Fire Groups based in fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.			
36	Brown, J.K.	1992	A case for management ignitions in wilderness; fire management notes	APIS, ISRO, SLBE, VOYA
	A discussion of why, In many wilderness areas, especially small ones, management-ignited prescribed fire may be the best way to preserve natural conditions.			
37	Buech, R.R., Siderits, K., Radtke, R.E., Sheldon, H.L., Elsing, D.	1977	Small mammal populations after a wildfire in northeast Minnesota; Research Paper	GRPO, MISS, SACN, VOYA
	Small mammals were studied shortly after a large wildfire in northeast Minnesota. An average of only 16 percent as many small mammals were in three forest communities that had burned than were in comparable unburned areas. The greatest reduction was for the red-backed vole. An analysis of population attributes suggests that deer mice immigrated to the burned area. Small mammal succession and their impact on reforestation is predicted.			
38	Burgan, R.E.	1987	Concepts and interpreted examples in advanced fuel modeling	VOYA
	Expands upon the basic concepts of fuel modeling to provide a more complete discussion of the technical details of constructing site-specific fire behavior fuel models.			
39	Burgan, R.E.	1988	1988 revisions to the 1978 National Fire-Danger rating system	VOYA
	The 1978 National Fire-Danger rating system does not work well in the humid environment of the Eastern United States. System modifications to correct the problems and their operational impact on System users are described. A new set of 20 fuel models is defined and compared graphically with the 1978 fuel models. Technical documentation of System changes is provided.			
40	Burgan, R.E., Andrews, P.L., Bradshaw, L.S., Chase, C.H., Hartford, R.A., Latham, D.J.	1997	Current status of the wildland fire assessment system (WFAS); Fire Management Notes	VOYA
	The Fire Behavior Research Work Unit of the Intermountain Research Station has been developing the Wildland Fire Assessment System (WFAS) since 1994. The WFAS will use the best methodology available to provide fire potential assessments for the 21st century. It will eventually combine the functionality of the current fire danger rating system and the fire behavior system. This article describes the current status of this on-going work.			
41	Burgan, R.E., Hartford, R.A., Eidenshink, J.C.	1996	Using NDVI to assess departure from average greenness and its relation to fire behavior	VOYA
	A new satellite-derived vegetation greenness map, departure from average, is designed to compare current-year vegetation greenness with average greenness for the same time of year. Live-fuel condition, as portrayed on this map, and the calculated 1000-hr fuel moistures, are compared to fire occurrence and area burned in Montana and Idaho during the 1993 and 1994 fire seasons.			

42	Burkman, Margaret A.	1993	The use of fire to manage breeding habitat for Yellow rails	PIRO
	Breeding habitats in sedge marshes for the semi-colonial Yellow rail were examined from 1991-93 by comparing 5 pairs of plots: prescribed-burn habitats and unburned control habitats in Seney National Wildlife Refuge, MI. Pre-burn vegetation evaluation was conducted in August 1991. Post-burn habitat evaluations were conducted July-August 1992 and July-September 1993. In each plot 12 measurements were taken of water depth and pH. At 12 sites per plot, vegetation was sampled in a 10 cm x 50 cm rectangle. Herbaceous vegetation was clipped at ground level, and biomass was evaluated. Living herbaceous vegetation was identified to species and counted. Analysis of variance (ANOVA) was used to compare percent cover of scrubs between yrs for the burned and control plots. Average heights of herbaceous vegetation and stem densities were also calculated and compared. Surveys of male vocalizations took place at night during late May and June, compass readings were taken when Yellow Rail vocalizations were heard and triangulation was used to determine their location. Management prescriptions are provided.			
43	Byram, G.M.	1954	Atmospheric Conditions Related to Blowup Fires	VOYA
	Occasionally a forest fire burns with an intensity that seems far out of proportion to apparent burning conditions. Although infrequent, these unusual fires have over a long period of time been responsible for the major loss of life in forest fires and a large part of the losses in property and forest values. Each blowup fire raises the question: What can we do to recognize the conditions causing extreme fire behavior and how can we predict them in advance? From a study of atmospheric conditions that have accompanied a number of blowup fires, there emerges a rather definite picture. This paper discusses the four conditions under which, when they occur simultaneously, fires seem most likely to blow up.			
44	Childs, Frank	1937	Forest conditions, Isle Royale National Park (Proposed), May-June 1937	ISRO
	Written following the large 1936 fire on Isle Royale, this report is a description of forest conditions on Isle Royale in the early summer months of 1937. Contains many small black and white photos of the forest fire effects. A great deal of blow-down was noted in the areas surrounding the burned area, probably due to burned tree roots or root exposure from burned duff. Fire hazard reduction in these areas is discussed. This paper has a "Map of Isle Royale showing major 1936 forest fires" which has the locations for the photographs marked on it.			
45	Christensen, N.L.	1995	Fire and wilderness; International Journal of Wilderness	APIS, ISRO, SLBE, VOYA
	In the absence of fire within a normal range of incidence and severity, even wilderness ecosystems become unnatural. To restore fire to historical levels will require that wilderness managers use planned ignitions. To compensate for 80 years of fire control, and the absence of ignitions by aboriginals, wilderness managers must seriously consider using planned ignitions.			
46	Clark, J.S.	1990	Fire and climate change during the last 750 yr in northern Minnesota; Ecological Monographs	APIS, GRPO, ISRO, VOYA
	Charcoal stratigraphic analysis and fire scars on red pine were used to determine spatial and temporal occurrence of fire in 1 [square kilometer] of old-growth mixed conifer/hardwood forest in northwestern Minnesota. The combined methods for fire-history analysis provided a more detailed spatial and temporal documentation of fire regimes than has previously been possible from analysis of fire scars or of charcoal counts derived from fossil pollen preparations. Because climate varies continuously, the responsiveness of disturbance regime to short- and long-term climatic change suggests caution in the interpretation of fire frequencies that derive from space/time analogies or extrapolation from short-term data.			
47	Coffman, Michael S. Dr, Rakestraw, Ferris	1980	The fire and logging history of Voyageurs National Park	VOYA
	To document original vegetation, historic fire patterns, modern fire patterns, logging activities, their impact on the vegetation and successional patterns developing in Voyageurs National Park, a two-year study was conducted (1978-1980). Present vegetation, fire evidence, logging evidence, and relevant historic records were investigated during the course of this study. A type map of the original vegetation was prepared from the original survey notes taken in 1884-1894. Comparison of this map with the current type map shows significant type shifts from predominately pine and spruce-fir forests to predominately aspen forests today. The presettlement fire regime was the primary factor maintaining the pine types while logging has been the primary factor effecting the establishment of aspen types. Five general site types were identified using Bray-Curtis ordination and synecological coordinates. These site types ranged from dry jack pine sites to very wet swamp conifer sites, and have had differing fire and logging histories and the successional dynamics reflect these differences. In the absence of fire or other major disturbances most stands will climax in spruce-fir types.			

48	Cohen, J.D.; Novin, S.C., Waldrop, T.A., Editors	1991	Some thoughts on prescribed natural fires; Fire and the environment: ecological and cultural perspectives; General Technical Report	APIS, ISRO, SLBE, VOYA
	Wildland fire is a significant component of nearly all North American ecosystems. High-intensity, stand-replacement fires are normal in certain ecosystems, especially in the northern Rocky Mountains. Wilderness fire managers are obligated to let fire operate as a natural influence to the extent that this is possible. Where wilderness areas incorporate stand-replacement-type ecosystems, ecologically significant prescribed natural fires must reach stand-replacement fire intensities. However, & fire managers are unable to predict whether prescribed natural fires will escape prescribed boundaries. Moreover, the effectiveness of suppression actions decreases are wilderness fires increase in size. Thus fire managers face the dilemma of managing for natural fire influences on ecosystems, with the consequence of increasing the potential for escaped fire situations.			
49	Cole, Kenneth L.	1986	Fire intensity and rate of spread for the April 18, 1986 research burn at Howes Prairie	INDU
	This report details observations and measurements of rate of spread, flame height and temperature made by park staff and volunteers on the first prescribed research burn of Howes Prairie on April 18, 1986. Temperature sensitive monitors were used to determine fire intensity and flame heights for the burn. A map of the burn area is included, along with weather on the day of the burn, and additional maps with flame height and intensity plotted. Recommendations for future prescribed burns are made based on the data.			
50	Cole, Kenneth L.	1996	Preliminary Report on the Fire and Vegetation History of Isle Royale containing unpublished data contributed by Marjorie G Winkler, Robyn Aflakne, and Timothy Cochrane	ISRO
	no abstract available			
51	Cole, Kenneth L.	1997	Research results from the Western Great Lakes Global Change Research Program (ABSTRACT); Lake Superior National Parks research conference	ISRO, PIRO, SLBE
	As part of the USGS Global Change Research Program, fossil pollen and charcoal records have been produced for Isle Royale and Voyageurs National Parks, and Apostle Islands, Pictured Rocks, Sleeping Bear Dunes, and Indiana Dunes National Lakeshores. The records aid in the reconstruction of vegetation responses to climate change and fire, and at Isle Royale and Voyageurs, have helped to reconstruct historic aquatic conditions. The data was used to determine the increase in the rate of vegetation change since presettlement times.			
52	Cole, K.L., Flakne, R.A., Myers, James, Engstrom, D., Harlow, D.E.	1998	Two hundred years of vegetation and fire history on Isle Royale	ISRO
	Isle Royale is an isolated island surrounded by Lake Superior. Because of its location and settlement impacts spread over the last several hundred years, the extent of these impacts on the island's vegetation are poorly known. A modern vegetation map was compared to a presettlement vegetation map generated from AD 1847 General Land Office (GLO) Survey data using a Geographic Information System (GIS). Although the spatial coverage of these data were adequate, the temporal coverage was incomplete. The spatial data from the GIS was compared to temporal pollen and charcoal records from sediment cores. The sediment cores demonstrated recent trends in vegetation change which were not apparent from the spatial data and the spatial data demonstrated changes which were not evident in the temporal data. The combination of both approaches produced a more robust understanding of settlement and recent vegetation change.			
53	Cole, Kenneth L., Flakne, Robyn A., Engstrom, Daniel R., Harlow, David Eric	1997	Three hundred years of vegetation and fire history on Isle Royale; Ecological Society of America Bulletin	ISRO
	no abstract available			
54	Cole, Kenneth L., Flakne, Robyn A., Winkler, Marjorie	1993	1993 investigators annual report: Holocene paleoenvironments of Great Lakes National Parks	ISRO
	The purpose of this study is to develop a regional network of paleoecological data through the analyses of fossil pollen and charcoal from Great Lakes parks, including Isle Royale. Questions addressed include the influence of the lake effect and fire frequency. Records of fossil pollen and charcoal will be used to reconstruct the Holocene paleoenvironmental history of the parks. This report includes progress to date and significant findings on this project with data specific to Isle Royale.			

55	Cole, Kenneth L., Klick, Kenneth F., Pavlovic, Noel B.	1992	Fire temperature monitoring during experimental burns at Indiana Dunes National Lakeshore; Natural areas journal	INDU
	The article provides the results of efforts at the Indiana Dunes National Lakeshore to quantify fire temperature using a series of temperature-sensitive paints. Fire temperatures were measured during several prescribed fires in a mosaic of prairies and oak woods to determine variability in fuel characteristics and in the pattern of fire spread. Associated charts and graphs of temperatures are included.			
56	Cole, Kenneth L., Pavlovic, Noel	1987	History, composition, and preservation of a sand prairie in northern Indiana [Abstract]; 8th Northern Illinois Prairie Workshop - Preserving our Heritage, Restoring our Past	INDU
	The composition of Howes Prairie in the Indiana Dunes National Lakeshore was studied using a series of vegetation plots. Samples were taken in 1983, 1985, and 1986 for overstory, sapling, shrub, and herb strata. Ongoing trends in vegetation change since a 1986 prescribed burn are examined.			
57	Cole, Kenneth L., Pavlovic, Noel B., Klick, Ken	1987	Preliminary report on the effects of prescribed research burns at Howes Prairie	INDU
	This report provides a preliminary outline of a fire management strategy for the dune savannas of Indiana Dunes National Lakeshore. Vegetation, soil, and water sampling data provide details on the structure and history of the Howes Prairie Ecosystem. Various tables, charts, and graphs of this data are included. Management recommendations are also made based upon this data.			
58	Cole, Kenneth L., Taylor, Robert S.	1995	Past and current trends of change in a dune prairie/oak savanna reconstructed through a multiple-scale history; Journal of vegetation science	INDU
	The history of Howes Prairie at the Indiana Dunes National Lakeshore was reconstructed using aerial photographs, stand structure of multiple-stemmed trees and fire scars, General Land Office Survey data, and fossil pollen and charcoal records. This data was used to determine vegetation change and fire history, both for the 20th century and historically. Comparative photographs, charts, and graphs illustrate the vegetational change.			
59	Cole, Kenneth L. (Unpublished Data Contributed By: Winkler, Marjorie G., Flakne, Robyn A., Cochrane, Timothy)	1995	Preliminary report on the fire and vegetation history of Isle Royale	ISRO
	Studies of the vegetation and fire history of Isle Royale National Park have been underway over the last four years. Ten sediment cores from Isle Royale have been studied and results are now complete enough that generalized conclusions can be made. Preliminary conclusions as to the presence, periodicity and severity of natural fire on Isle Royale are presented. This paper contains two pages of tables listing the fire dates which occurred prior to park establishment and after park establishment.			
60	Cole, Kenneth; Laroe, Edward T., Farris, Gaye S., Puckett, Catherine E., Doran, Peter D., Mac, Michael J.	1995	Vegetation change in National Parks; our living resources: A report to the nation on the distribution, abundance, and health of US plants, animals, and ecosystems	PIRO
	Pollen analysis from 12-Mile Bog in Pictured Rocks National Lakeshore, MI revealed that the vegetation was more disturbed by logging and slash burning in the late 1800's than by any periodic wildfires during the previous 2,500 yrs. The forest is similar in the 1990s to what it was 2,000 yrs ago.			
61	Coon, C., Hattenbach, M., Uhlemann, E., Keith, R.	2002	Indiana Dunes National Lakeshore fire effects monitoring protocols 1994-2002	INDU
	This report was created for the purpose of combining the protocols from all the years of the fire effects monitoring program into one document. The most current protocol for each section will be described, along with the specifics of how and why it was changed. This way, separate reports will not need to be read when reviewing our program’s fire effects monitoring procedures as they differ from year to year and as they deviate from the Fire Monitoring Handbook (FMH).			
62	Cooper, C.F.	1961	The ecology of fire; Scientific American	VOYA
	Fire has played a major role in shaping the world's grasslands and forests. Attempts to eliminate it have introduced problems fully as serious as those created by accidental conflagrations.			

63	Cooper, William S.	1928	Seventeen years of successional change upon Isle Royale, Lake Superior; Ecology	ISRO
	A comparative review of conditions found over a seventeen year period; includes remarks on changes in aquatic vegetation. Describes the rate of change in the secondary burn succession on Smithwick Island. Describes the Rock Shore Succession at Rock Harbor Lodge by measuring changes in size of lichens and absence of shrubs. Observations of Bog Succession were inconclusive except that the author notes the conversion of the sedge mat zone to a mere mud wallow due to the arrival of and increase in the moose population.			
64	Copeland, T.E., Sluis, W., Howe, H.F.	2002	Fire season and dominance in an Illinois tallgrass prairies restoration; Restoration Ecology	INDU, LIBO, SACN, SLBE
	"North American prairie remnants and restorations are normally managed with dormant-season prescribed fires. Growing-season fire is of interest because it suppresses dominant late-flowering grasses and forbs, thereby making available light and other resources used by sub-dominant grasses and forbs that comprise most of prairie diversity. These preliminary results suggest that frequency and species richness of sub-dominants can be improved by late growing-season fire without compromising vigor of warm-season tallgrasses."			
65	Crowley, Katherine F.	1995	Patterns of temporal and spatial change in the vegetation of Voyageurs National Park	VOYA
	"Patterns of compositional change in the vegetation of Voyageurs National Park, northern Minnesota were studied through an analysis of permanent-plot data collected in 1977-78 and 1992-93. The park's vegetation is a mosaic of single and mixed-species conifer and hardwood trees. This study examined significant compositional changes and rate of change in the vegetation, in the context of successional processes, fire and land-use history, spatial scale, and predictability of future change. Changes during the study period included slow, expected aging of currently undisturbed vegetation types, maturation and extensive senescence of trees in disturbance-dependent types, and rapid, inconsistent change in recently disturbed or recovering types." (Quoted from the authors abstract)			
66	Dames & Moore, Inc.	1992	Wildfire emergency action plan guidance document	VOYA
	A group of state and federal air pollution and wildfire management experts have prepared recommendations for better dealing with air quality impacts of wildfires. Key issues dealing with communication and cooperation between fire management and air quality personnel were addressed through a series of recommendations. In addition, a program outlining an air quality monitoring program adequate to assess the potential impacts on public health was also developed.			
67	Davich, Jerry	1998	Lighting nature's way; the Vidette times	INDU
	The article describes a prescribed burn set at Indiana Dunes National Lakeshore to maintain vegetation. Fire weather conditions required for prescribed burning and methods used to maintain a controlled fire are discussed. Locations of fires that were already burned and were scheduled to be burned that season are also mentioned.			
68	Davis, J.B., Martin, R.E., Technical Coordinators	1987	Proceedings of the symposium on wildland fire 2000	VOYA
	This "futuring" symposium addressed the possible, preferred, and probable status of wildland fire management in the year 2000 and beyond. Papers cover the fire protection needs of the public, management response to these perceived needs, and the research and education required to meet these needs. Also covered in a separate section are the interactions between forest user, manager, and researcher, as well as international issues. Nine papers, developed by the futuring process and presented at the symposium examine key trends, define preferred "visions" of fire management in the year 2000, and describe strategies to achieve these visions. One paper describes how the Incident Command System (ICS), which is popular among fire service agencies, was used to organize and conduct the symposium.			
69	De Groot, W.J., Groot, W.J.D.	1993	Examples of fuel types in the Canadian Forest Fire Behavior Prediction (FBP) System; Canadian forest fire danger rating system	APIS, GRPO, ISRO, PIRO, VOYA
	A full-color folder poster including photographs and text describing examples of each of the fuel types used in the Canadian Forest Fire Behavior Prediction (FBP) System. Two photos, the first a benchmark, or most representative example, and the other, typical variation, and a brief narrative are shown for each fuel type.			

70	Deeming, J.E., Lancaster, J.W., Fosberg, M.A., Furman, R.W., Schroeder, M.J.	1974	National fire-danger rating system	VOYA
	The National Fire-Danger Rating (NFDR) System produces three indexes - Occurrence, Burning, and Fire Load - that measure relative fire potentials. These are derived from fire behavior components - Spread, Energy Release, and Ignition - plus a consideration of Risk. The NFDR System is solidly based on the physics of fire behavior - it is not empirical or statistical. It makes use of fuel models, an open-ended means of treating the myriad of naturally occurring fuel situations. Fuel moisture, wind, and risk are the principle variables accounting for the day-to-day fluctuations of fire danger. Instructions and tables necessary to manually compute the indexes and components for all nine fuel models are presented.			
71	Dickmann, Donald L., Cleland, David T.	no date	Fire return intervals and fire cycles for historic fire regimes in the Great Lakes region: a synthesis of the literature (DRAFT)	GRPO, ISRO, PIRO, VOYA
	"Discussions and descriptions of a 'fire regime' require consideration of ecological context. As such a fire regime is defined by not only the meteorological, physical, and biological properties of an ecosystem, but also by the spatial, temporal, and behavioral characteristics of the fires that burn in it. Although wildland fires are affected by many variables, the fire regime of a particular ecosystem usually is quite distinctive when defined within a particular historic time period. The fundamental premise for this discussion is that fire has been ubiquitous in all Great Lakes ecosystems during the Holocene epoch, although the characteristic periodicity varies by several orders of magnitude according to regional and landscape ecosystem. ...."			
72	Douhan, Carl J., Knutson, Randy L., Cole, Dr. Kenneth L.	1991	Using GIS to develop fire management strategies	INDU
	This article briefly describes the actions of Resource Management personnel at the Indiana Dunes National Lakeshore in using the lakeshore's Geographical Information System to determine the wildfire frequency in certain areas of the park. The information from the analyses is to be used in refining the Fire Management Plan, which was under revision at the time. A brief description of the park is provided, with a description of plans for analyzing and utilizing the fire data.			
73	Englin, J., Boxall, P.C., Chakraborty, K., Watson, D.O.	1996	Valuing the impacts of forest fires on backcountry forest recreation; Forest Science	APIS, GRPO, ISRO, PIRO, SACN, SLBE, VOYA
	A discrete choice travel cost model was developed for backcountry forest recreation using 2 yr of backcountry canoe registrations from Nopiming Park, Manitoba. A statistically significant variable explaining choice of route was the amount of forest along the route that was burned in the last 10 yr; virtually all of which in two particularly severe fires during 1983. &. A linear intertemporal damage function for on of the fires is estimated, and the present value of damages under alternative discount rate assumptions is presented.			
74	Environmental Protection Agency	1998	Interim air quality policy on wildland and prescribed fires	VOYA
	Title self-explanatory			
75	Finney, M.A.	1998	FARSITE: fire area simulator - model development and evaluation	VOYA
	A computer simulation model, FARSITE, includes existing fire behavior models for surface, crown, spotting, point-source fire acceleration, and fuel moisture. The model's components and assumptions are documented. Simulations were run for simple conditions that illustrate the effect of individual fire behavior models on two-dimensional fire growth.			
76	Frandsen, W.H., Andrews, P.L.	1979	Fire behavior in nonuniform fuels	VOYA
	Predicting fire behavior in nonuniform fuel arrays is a problem requiring: (1) a method of assessing fuel nonuniformity, (2) a method of simulating fuel nonuniformity, and (3) an algorithm governing fire spread through a simulated array. The bulk fuel properties (load, depth, average particle size, etc.) are partitioned into a honeycomb array. An algorithm simulates fire spread through the array by coupling predictions of heat flowing from a burning cell to predictions of the heat required for ignition of its adjacent cells. Multiple results of fire behavior are displayed as distributions in contrast to previously generated singular values. Methodology is emphasized.			

77	Frelich, L.E., Carlton, D.	2001	Final ecological and fire conditions Boundary Waters Canoe Area Wilderness	APIS, GRPO, ISRO, PIRO, VOYA
	The Boundary Waters Canoe Area Wilderness on the Superior National Forest is one of the most heavily used wilderness areas in the United States. On July 4, 1999, heavy rains and straight-line winds greater than 90 miles per hour caused extensive forest blowdown and flooding throughout northeastern Minnesota and adjacent areas in Canada. The windstorm increased the amount of dead and down material on the ground. These materials, called slash fuel, increased from 5 to 20 tons per acre to 50 to 100 tons per acre. This increase in material on the ground will allow ignition, development, and rapid spread of high-intensity fires that are difficult to control under a wide variety of weather conditions. Under the right weather conditions, there is an increased potential for wildfire within the Wilderness that could move from within the Wilderness to adjacent private, State, and National lands or across the international border into Canada.			
78	Furyaev, V.V., Wein, R.W., MacLean, D.A.; Wein, R.W., MacLean, D.A.	1983	Fire influences in Abies-dominated forests; the role of fire in Northern Circumpolar Ecosystems; SCOPE 18	APIS, GRPO, ISRO, VOYA
	Abies -dominated forests have a relatively low fire hazard when compared with vegetation types dominated by *Pinus* or *Picea* species. When fire occurs after prolonged drought periods, fir can be essentially eliminated from an area because it is not resistant to fire. *Abies* spp. tend to be shade tolerant, late-successional species and only in the absence of fire do they compete successfully with species established early in the post-fire pattern. *Abies* -dominated forests are more susceptible to fire following disturbance which damages of removes tree crowns, and in turn permits solar energy to reduce the moisture content of forest floor fuels. Forest harvesting is one of the recent disturbances, but it is thought that defoliation and tree mortality caused by insects also increase fire hazard. This insect-wildfire hypothesis has been raised in a number of *Abies* -dominated areas around the world and seems intuitively plausible; yet there is little field evidence and very little experimental evidence to support the hypothesis.			
79	Gabbert, Bill	1986	Prescribed burn plans	INDU
	Two folders contain prescribed burn plans for the Indiana Dunes National Lakeshore. Most plans contain similar information, including the following topics: burn unit descriptions, fuel load analysis, vicinity maps, goals and objectives, organization, costs, scheduling, pre-burn considerations, fuel models and vegetation tables, firing methods, weather information, smoke management, coordination, and public involvement. The burn plans encompass several areas of the park, including the Indian Boundary Prairie, Howes Prairie, Inland Marsh, the Visitor Center area, Lupine Lane, Burns Ditch, restoration areas, Goodfellow, Cowles Dunes, Furnessville, West Ogden, Kansas, the Douglas Center area, and Beverly Shores. Plans are updated with each new burn.			
80	Galley, K.E.M., Wilson, T.P.	2001	Proceedings of the invasive species workshop: the role of fire in the control and spread of invasive species; Invasive Species Workshop	GLKN
	The purpose of the Fire and Invasive Species workshop was to asses the state of knowledge of the interactions of fire and invasive plants, including fire management practices related to control and susceptibility, influence of invasive species on fire regimes, influence of fire on invasive species, and influence of land use and land management practices on invasive species and fire. A further purpose was to identify management information needs and related research needs and priorities, and to raise national awareness of fire invasive species issues. Although the issue of fire and invasive plant is often viewed as a problem predominantly in the western states, the workshop attempts to provide a national perspective of fire and invasive plants in the United States. The workshop proceedings are organized according to major ecoregions represented in the U.S.			
81	Gauthier, S., Bergeron, Y., Simon, J-P.	1996	Effects of fire regime on the serotiny level of jack pine; Journal of Ecology	APIS, GRPO, ISRO, PIRO, SACN, SLBE, VOYA
	Serotiny, the capacity to retain seeds in the plant canopy, has evolved in many species under the pressure of fires. The effect of disturbance type, time-since-fire and different fire regimes on the serotiny of jack pine, was evaluated in populations from two adjacent landscapes in the southern part of the Canadian boreal forest. The island landscape has a complex fire regime of small fires of variable intensity, whereas the adjacent mainland has a fire regime characterized by large intense fires. Significant differences were found between the two landscapes. These results support the hypothesis that fire imposes differential selective pressures on serotiny in jack pine.			

82	Gibson, William L.	1980	Succession in upland boreal forest understory vegetation in Isle Royale National Park	ISRO
	This study documents presence and abundance (relative cover) of bryophyte and shrub species in the upland boreal forest type in Isle Royale National Park, and notes changes in the understory species composition which accompany post-fire succession. These same strata are described for unaged, savanna-like areas which are interspersed throughout the forest landscape. A total of 101 species is noted in a combined group of all stand ages. Importance values of prevalent herb-low shrub species when plotted on a time gradient show one of three trends. They either increase over the entire range, decrease over the entire range, or increase to some intermediate peak and then decline. It is determined that the herb-low shrub stratum is most species rich during early stages of succession, but species dominance (by foliar cover) is more evenly distributed in the later stages.			
83	Girshner, Karen	1988	Mid-summer fire: effects on the vegetation of Tolleston Dunes	INDU
	This report examines the effects of an unusual summer fire on the vegetation of Tolleston Dunes at the Indiana Dunes National Lakeshore. The effects of the fire on the trees and shrubs of the area, and the amount of resprouting by the trees and shrubs are examined. Comments on the sprouting and size distributions of black oak (*Quercus velutina*), quaking aspen (*Populus tremuloides*), and sassafras (*Sassafras albidum*) are provided. Conclusions and future study recommendations are made. Topographic maps of the study area, and most of the raw data are included, along with several slides of the study area.			
84	Gorman, K.F.	2003	Regional FMO meeting field trip participant information packet	VOYA
	This is the information packet that was provided to participants in the field trip portion of the 2003 Midwest Region Fire Management Officers Meeting at Voyageurs National Park. Contents include the field trip itinerary; a brief explanation of the Canadian Forest Fire Weather Index System and FWI indexes recorded for red and white pine understory prescribed burns at Voyageurs; a short summary report of the results of understory burning in red and white pine stands at Voyageurs, as an example of the analyses possible with the NPS Fire Effects Monitoring Software, and the 2001 and 2002 Fire Effect Monitoring Annual Reports for Voyageurs; a summary of Voyageurs FMH fire effects monitoring plot protocols; and an assortment of maps of Voyageurs National Park, including Fire Management Units, Vegetation Communities, Fire History, the Five-year Burn Plan, Canadian FBP System Fuel Types, BEHAVE Fire Behavior Prediction Fuel Models, and FMH Fire Effects Monitoring Plot Locations.			
85	Gorman, K.F.	2003	Developing landscape strategies for Indiana Dunes National Lakeshore	INDU
	Detailed proceedings and notes from the Developing Landscape Strategies workshop held November 12 and 13 at Indiana Dunes National Lakeshore, which was designed to help clarify vegetation and fire management goals and objectives. Includes target condition, important species, goals, objectives, research needs, and other notes for each of five major vegetation communities: Mnoke Tallgrass Prairie, Mesic Sand Prairie, Oak Prairie-Savanna-Woodland-Forest Complex, Mesic Dune Forest, and Herb-dominated Wetlands; and notes from a discussion of vegetation monitoring techniques. Includes notes by recorder Amy Davies and facilitator KellyAnn Gorman, contributions from participants, overheads, PowerPoint slides, blank worksheets, participant and supporting materials, ecological models, and a record of pre-workshop correspondence. Includes the summary report. Also includes a 3.5" floppy disk containing electronic versions of most workshop materials.			
86	Gorman, K., Morgan, P.	2001	To burn or not to burn in Isle Royale National Park, Michigan	APIS, GRPO, ISRO, PIRO, VOYA
	In many natural areas in the United States, fires are less frequent and smaller than they used to be, despite policies permitting wildland fire use. In such cases, it is recommended that managers ignited fires to remedy detrimental effects of past fire suppression and prevent further changes in the system. Isle Royale National Park has permitted lightning-ignited fires to burn undisturbed under prescribed conditions since 1982, but managers have speculated that the total area burned represents only a small fraction of the area burned under the natural fire regime. The use of prescribed fire could be justified if the current fire regime is significantly different, due to suppression activities, than it was historically. I examined historical fire occurrence and the response to fire of vegetation on the island to assess whether the current fire regime on Isle Royale is outside of the range of natural variability. I conclude that there is not sufficient evidence to justify the use of prescribed fire in Isle Royale National Park because the current wildland fire use policy is sufficient to allow fire to play its natural role in the ecosystem.			

87	Gorman, Kelly Ann, Morgan, Penelope; Belant, Jerry, Bruff, Gregg, Bruggink, John, Leonard, Jill, Route, Bill	2002	To burn or not to burn in Isle Royale National Park, Michigan; Western Great Lakes Research Conference - program and abstracts of papers presented	ISRO
	The main island of Isle Royale National Park, MI was examined to determine if prescribed fire were justified to remedy detrimental effects of past fire suppression prior to 1982, since which time lightening-ignited fires have been allowed to burn undisturbed. History of fire occurrence and related factors of topography, drought, and vegetation were analyzed using Palmer Drought Severity Index. Fires on Isle Royale have not been randomly distributed, and most plant communities are not fire-dependent. Fire rotation data were presented. Recommendations based on analysis of the data state that current wildland fire policy is adequate to maintain the natural role of fire in the ecosystem and that prescribed fire is unnecessary.			
88	Grand Portage National Monument	1997	Grand Portage National Monument wildland fire management plan	GRPO
	"This Wildland Fire Management Plan is a detailed program for action for park management to implement National Park Service and Grand Portage National Monument fire management policies and objectives. Therefore, this plan is the primary guide for all wildland fire management actions within the National Monument, including response to wildfire and the conduct of prescribed fires." (from author's intro) All aspects of wildland fire management are included within this document. Specifically, there are sections describing, in detail, the natural resources within the Monument such as vegetation, wildlife, hydrology, topography, soils, climate, air, and cultural resources. Also included are the general fire management objectives and strategies, and fire management units descriptions, organizational structure and responsibilities. Wildfire and management-ignited prescribed fire programs are discussed in detail, as well as air quality/ smoke management guidelines, public safety, and fire monitoring and research.			
89	Hach, Larry	1993	Fire protection plan: wildland (forest) and structural fires (statement of fire management objectives): Pictured Rocks National Lakeshore	PIRO
	The report discusses the methods to be used for the pre-suppression, suppression, and prevention of fires to ensure the protection of human life and prevent damage to the natural and cultural features of Pictured Rocks National Lakeshore.			
90	Haines, D.A., Smith, M.C., Simard, A.J.	1987	Horizontal vortices in wildland fires; Ninth Conference on fire and forest meteorology	VOYA
	The subject of horizontal vortices in wildland fires is relatively unexplored. The objectives of this paper are threefold. First, we document field observations of the three types of horizontal vortices and supply available (sometimes meager) meteorological and fuel data. Next, we examine selective conceptual and laboratory applications. Finally, we discuss the importance of these observations and list a number of unsolved problems and unanswered questions.			
91	Hansen, Henry L., Krefting, Laurits W., Kurmis, Vilis	1973	The forest of Isle Royale in elation to fire history and wildlife; Minnesota Agricultural Experiment Station Technical Bulletin 294 Forestry Series 13	ISRO
	This study had several objectives. The broad objective was to explore the unique advantages of a large wilderness island as a field laboratory for advancing the knowledge of forest ecosystems. Special reference was placed on forest succession, fire history, browse production, and the role of primary production as the homeostatic control of moose populations. Within this framework were several more specific goals: (1) To identify and describe major forest types according to tree, regeneration, shrub, and herbaceous components. This information is needed for other studies. It's been available only in fragments for the island; (2) To associate primary and secondary successional trends in forest types with their consequences to populations of several wildlife species, especially moose.			
92	Harrington, M.G.	1987	Predicting reduction of natural fuels by prescribed burning under ponderosa pine in southeastern Arizona	VOYA
	Results from 10 prescribed burns conducted under different weather and fuel conditions in ponderosa pine stands in southeastern Arizona indicate that forest floor fuel consumption can be estimated using H-layer moisture content, and either preburn forest floor depth or stand density. Equations presented give forest managers the ability to estimate, and thus prescribe, amounts of fuel that would be consumed by prescribed fire or unplanned ignition.			
93	Harris, Richard	no date	Summary of the 1986 study in Howes Prairie to examine the effect of fire on small mammals [DRAFT]	INDU
	The report summarizes the findings of a 1986 study of the small mammals trapped at Howes Prairie at the Indiana Dunes National Lakeshore before and after a prescribed burn. The diversity of small mammal species in the area is discussed, as well as the determination of effects of fire on small mammal communities. Recommendations for continuance of the project are made. There are also several pages of data sheets, with specific information about each mammal trapped.			

94	Heinselman, M.L.	1973	Fire in the virgin forests of the Boundary Waters Canoe Area, Minnesota; Quaternary Research	GRPO, VOYA
	Fire largely determined the composition and structure of the presettlement vegetation of the Boundary Waters Canoe Area as well as the vegetation mosaic on the landscape and the habitat patterns for wildlife. It also influenced nutrient cycles, and energy pathways, and helped maintain the diversity, productivity, and long-term stability of the ecosystem. Thus the whole ecosystem was fire-dependent. &. A Natural Fire Rotation of about 100 yr prevailed in presettlement times, but many red and white pine stands remained largely intact for 150-350 yr, and some jack pine and aspen-birch forests probably burned at interval s of 50 yr or less. There is paleoecological evidence that fire was an ecosystem factor before European man arrived and even before early man migrated to North America. Probably few areas ever attained the postulated spruce-fir-cedar-birch climax in postglacial times. &. To restore the natural ecosystem of the Boundary Waters Canoe Area fire should soon be reintroduced through a program of prescribed fires and monitored lightning fires. Failing this, major unnatural, perhaps unpredictable, changes in the ecosystem will occur.			
95	Hely, C., Flannigan, M., Bergeron, Y., McRae, D.	2001	Role of vegetation and fire weather on fire behavior in the Canadian mixedwood boreal forest using two fire behavior prediction systems; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, VOYA
	"Spring and summer simulations were carried out using the Canadian Fire Behavior Prediction (FBP) and U.S. BEHAVE systems to study the role of vegetation and weather on fire behavior in the mixedwood boreal forest. ... The predicted fire behavior variables were rate of spread (ROS), head fire intensity (HFI), and area burned. Results from ANOVA testing showed that both weather and vegetation are not always significant, and the two prediction systems qualitatively attribute the explained variance to these factors differently. The FBP System selects the weather factor as the most important factor for all fire behavior variables, whereas BEHAVE selects the vegetation factor. However, three research burns located in Ontario revealed that BEHAVE was not well adapted to the mixedwood boreal region, whereas FBP predictions were quantitatively close to observed prescribed values. ...."			
96	Henderson, Norman R.	1982	Research burns in the black oak woodlands at Indiana Dunes National Lakeshore [Draft Proposal]	INDU
	This proposal calls for a research burn program to be established for Indiana Dunes National Lakeshore exploring stand dynamics of black oaks (*Quercus velutina*) immediately following a fire. This paper presents a review of past research at the park regarding the fire history and ecology of the dunes region. A research and burn plan is presented outlining the prescription criteria needed to test specific hypotheses and objectives.			
97	Henderson, Norman R.	1982	A comparison of stand dynamics and fire history in two black oak woodlands in northwestern Indiana; Research/Resources Management Report	INDU
	To quantify the role of disturbance in the black oak community of northwestern Indiana, two black oak (*Quercus velutina*) woodlands in the Miller Woods and Inland Marsh areas of the Indiana Dunes National Lakeshore were compared with regard to species composition and stand structure characteristics. Various vegetation parameters, such as density and species composition were measured. Fire history in each area was determined through tree ring analysis of cross sections, wedges of fire scarred black oaks, and written fire records. Tables represent climatic data, rainfall averages, tree density, biotic and fire parameters, and tree scarring records.			
98	Henderson, Norman R.; Cole, Kenneth L., Hiebert, Ronald D., Wood, James D., Jr.	1987	The role of fire succession in the sand dune plant communities of Lake Michigan; proceedings of the first Indiana Dunes research conference: symposium on plant succession	INDU
	Successional models by Cowles (1899 and 1901) and Olson (1958) are reevaluated using fire as a potentially major ecological component within the dunes plant communities. The influence of fire is evaluated using geographical, historical, climatological, and edaphic factors.			
99	Henderson, Norman, Hiebert, Ron	1982	Proposal to study the effects of fire and flooding on the Howes Prairie Ecosystem	INDU
	A research project is proposed which consists of a multi-year study to determine the effect of both contemporary and presettlement disturbance regimes, relating primarily to fire and periodic flooding on the integrity (specifically the invasion of woody species) of the Howes Prairie ecosystem. It is designed to investigate the potential success of utilizing prescribed fire to restore and maintain this system. A set of hypotheses is proposed for testing, followed by a description of the study area. The location, community characteristics, soils, climate, and disturbance history are discussed. The methodology to be used is described in detail, including information about the fire regime and data analysis techniques. Maps, diagrams and plant community species are included at the end of the document.			

100	Henderson, Norman R., Long, James N.	1984	A comparison of stand structure and fire history in two black oak woodlands in northwestern Indiana; Botanical Gazette	INDU
	The composition and structure of two black oak (*Quercus velutina*) woodlands at Miller Woods and Inland Marsh in the Indiana Dunes National Lakeshore are examined. Specifically, possible interactions between frequency and intensity of fire on the composition and structure of the two stands are examined. Current conditions are compared with those existing in the early 1800's, based on public land survey records of the two areas. Fire histories during the past 50 years are reconstructed from fire scars, age-class distribution, and fire-control records. Vegetation data including frequency and distribution are represented in tables.			
101	Hiebert, Ronald D.	1982	Research burns in razed residential sites at Indiana Dunes National Lakeshore [Draft Proposal]	INDU
	This is a proposal to study the effects of fire on old lawns in the recovery of razed residential sites. A history of research on the effects of past land use on secondary succession is provided, and the specifics on the proposed project follow. Appendices include a list of equipment needed for the fire project, and a list of species present on the site.			
102	Hughlett, Henry	1986	St Croix National Scenic Riverway, fire management plan	SACN
	This is the initial policy towards fire on park lands within the Riverway. It calls for the complete and immediate suppression of fires on park land, and states that fire will not be used as a management tool at this time. Given is a brief description of the natural environment along the Riverway, including climate. A history of fires in the region is provided, along with the typical fire season and planned fire fighting organization and results.			
103	Indiana Dunes National Lakeshore	no date	Untitled: parkwide fuel loading data	INDU
	These files contain data on the woody fuel load and general fuel load inventories done at the Indiana Dunes National Lakeshore. Inventories include location, and fuel load summary including duff depth. Some inventories include soil moisture measurements and maps of survey areas.			
104	Indiana Dunes National Lakeshore	no date	Environmental assessment for the Indiana Dunes fire management plan	INDU
	This document assesses three alternatives for the management and study of fire at the Indiana Dunes National Lakeshore. A program of limited prescribed burning primarily for research purposes is preferred. Total fire suppression with no prescribed burning and total prescribed burning alternatives are also assessed. The need for the proposal is summarized, as well as the three alternatives and their environmental impacts.			
105	Indiana Dunes National Lakeshore	1985	Historical weather data and wildland fire danger ratings for Indiana Dunes National Lakeshore 1981-1983	INDU
	This document includes graphs showing the averages of various weather factors and National Fire Danger Rating System indices and components for Indiana Dunes National Lakeshore. Data was collected from the Bailly Fire Weather Station located at the Lakeshore's Headquarters in Porter, Indiana between May of 1981 and December 1983. Graphs and tables show temperature, relative humidity, precipitation, wind, and other fire danger rating components.			
106	Indiana Dunes National Lakeshore	1987	Untitled: fire management	INDU
	This folder contains information on fire management at the Indiana Dunes National Lakeshore. Copies of prescribed burn unit plans are included for Inland Marsh, Homesite restoration, Spring Shores, Furnessville, and Douglas. Correspondence related to these burn plans, and other fire management issues at the park, are also included. There are also short papers on plant species in the burn areas, and a description of the burn units, fire history, and prescriptions for burns at the lakeshore.			
107	Indiana Dunes National Lakeshore	1988	Fire management slides and prints	INDU
	This document consists of slides and prints from several years of fire activities in the Indiana Dunes National Lakeshore. Topics represented in photos include hazard trees, firing devices, permanent transects, engines and pumps, lupine research plots, oak sprout removal, and various prescribed fires at the park.			

108	Indiana Dunes National Lakeshore	1992	Fire management plan	INDU
	This document addresses the management of fire as an ecosystem process at the Indiana Dunes National Lakeshore. (EA is included in bound document.) The goals and policies of the fire management program are outlined, with a description of the environmental setting of the park and its resources. The objectives of the General, Resource, and Fire Management Plans are also addressed. Fire management units are defined in the plan, operational requirements for implementation of the program are described, the guidelines for management of ignited fire are delineated, and the fire prevention plan is described. The plan includes chapters on policy compliance, objectives, fire management units, fire management operations, fiscal management, management ignited fire (prescribed fire), prescribed natural fire, fire prevention, safety, cultural resources, and a plan review. Appendices cover a variety of topics, including environmental assessment, forms, cooperating agencies, future prescribed burns, fire prevention plan, and qualification lists.			
109	Indiana Dunes National Lakeshore	1993	Standard operating procedures--fire management, use of helicopters in fire suppression	INDU
	This paper on the use of helicopters in fire suppression addresses the requirements and protocol for acquiring a helicopter, information to give to the helicopter company over the telephone, necessary paperwork, communications with the helicopter, and flight restrictions for the Indiana Dunes National Lakeshore.			
110	Indiana Dunes National Lakeshore	1995	Resource management plan: Indiana Dunes National Lakeshore	INDU
	The report describes the management efforts and projects being implemented at Indiana Dunes National Lakeshore. A description of the physical environment is included.			
111	Indiana Dunes National Lakeshore	1997	INDU - fire management guidelines and standard operating procedures	INDU
	This document contains various operating procedure guidelines for fire management aspects of the Indiana Dunes National Lakeshore. Operating procedures are provided for the following topics: fire dispatch, use of aircraft in fire suppression, water availability at headquarters, fire investigations, detection surveys, use of blue lights on personal vehicles, emergency procurement, media contact, vehicles, WEPS unit, prescribed burn monitoring guideline - 1988, mechanical removal of tree sprouts, computer security, downed woody fuel load sampling, power outages, driver qualifications, pathogen exposure control, hazardous materials program, hearing conservation program, and confined space entry program. Each section is specific to the Indiana Dunes.			
112	Isle Royale National Park	no date	Wildfire action plan	ISRO
	The report lists the routine operations that will occur throughout the wildfire season (from arrival of opening crew to the island through their departure in the fall) regardless of the existing fire danger. It also lists additional operations that will occur as the fire load index changes.			
113	Isle Royale National Park	no date	Individual fire reports	ISRO
	The vertical files in the Natural Resource Specialist office contain fire reports for each fire on Isle Royale National Park beginning in 1937 through the present.			
114	Isle Royale National Park	1964	Fire atlas, thru (sic) 1964, Isle Royale National Park	ISRO
	An assortment of items are found in this fire atlas, including: 1. a small map labeled as "Fire Occurrence 1936-1959" showing locations and dates, origins, classifications of fires for this time period, 2. a small map labeled as "Fire Occurrence - 1960 Decade" showing locations, dates, causes and classifications of fires, 3. Forest Fire Report Summaries for individual years 1950-1964, a one page summary for 1940-1949, and a one page summary for 1950-1959, and 4. a small map labeled as "Man Caused Fires 1959-1964" showing locations, years started, and causes.			
115	Isle Royale National Park	1977	1977 Isle Royale National Park fire management assessment and public comments	ISRO
	The document includes the 1977 Environmental Assessment, A Fire Prescription for Isle Royale National Park, Wildfire Control Plan, Wildfire Action Plan and the public comment letters received regarding this information.			

116	Isle Royale National Park	1980	ISRO fire history	ISRO
	This history of structural, lightning ignited, camper/smoke ignited and rescue ignited fires occurring on Isle Royale was compiled in 1980 and includes fire history from 1937 through 1978. An individual fire report was prepared for each fire which includes date, location, cause, acres burned, suppression costs, and man hours used.			
117	Isle Royale National Park	1982	Fire data	ISRO
	This is a series of tables. Page one is titled "Multiple Start Days 1972-1981", page two is titled "Fire Occurrence Cause Analysis 1972-1981", page three is titled "Fire Occurrence by Size Class 1972-1981", and page four is titled "Fire Occurrence Bar Graph 1972-1981".			
118	Isle Royale National Park, Natural Resource Management Staff	1981	Fire Weather files	ISRO
	A series of 18 office files containing fire weather records for Rock Harbor, Mott Island, Windigo, Ishepeming Tower, and Mount Ojibway for the years 1981 through 1993. These files include hydrothermographs and AFFIRMS observations records.			
119	Isle Royale National Park, Natural Resource Management Staff	1995	Fire Database: c:\Data\Rmdata\GIS\Attfiles\Firesdbf	ISRO
	This is a dBase III+ file which lists the fires occurring on Isle Royale from 1937-1994.			
120	Isle Royale National Park, Natural Resource Management Staff	1997	Fire History Database	ISRO
	This database in Access software records the history of natural and human-caused fires as they occurred on Isle Royale during the years 1937-1997. The database includes name of the fire, date of start, date out, size, case number, cost, location, latitude and longitude coordinates and other comments. This database also includes support action to other parks.			
121	Isle Royale National Park, Natural Resource Management Staff	1998	FIR Weather Computer files	ISRO
	These computer files contain fire weather data for Windigo from 1965-present, for Mott Island from 1966-present, and for Ojibway Tower from 1987-present. This office also has a computer compact disc prepared in Kansas City, KS that has the fire weather data for Isle Royale from 1976-1997.			
122	Jakala, Stephen G.	1992	VOYA fire effects monitoring program summary	VOYA
	Thirteen upland community types occur in Voyageur's conditional fire management and fire suppression units. A projected 60 plots need to be established to monitor the success of Voyageurs' ignited prescribed burn program. This report briefly summarizes program achievements to date, including numbers of plots established, and number of plots burned. No descriptions or maps of plots are included.			
123	Jakala, Stephen G.; Brown, James K., Mutch, Robert W., Spoon, Charles W., Wakimoto, Ronald H.	1995	Underburning to reduce fire hazard in the southern boreal transition forest of Voyageurs National Park, Minnesota: preliminary results; proceedings: symposium on fire in wilderness and park management	VOYA
	In 1989, Voyageurs National Park's Wildland Fire Management Plan became the first National Park Service fire management plan to be reinstated for implementation after the moratorium following the 1988 Yellowstone fires. This Wildland Fire Management Plan divides the Park into three fire management units: Fire Suppression Units, Prescribed Natural Fire Units, and Conditional Fire Units. Since 1989, approximately 1,000 acres within the Park have been treated with management-ignited prescribed fire for hazard fuel reduction. All burns have had fire effects documented. This report summarizes some of the preliminary results (pre and post burn vegetation conditions) of some of these burn units.			

124	Jakala, Stephen G., Miles, Brenda	1991	Narrative: fire complex beginning August 26, 1991 - Voyageurs National Park	VOYA
	Narrative report describing series of fires that occurred within Voyageurs National Park boundaries during the summer of 1991. Provides dates, times, and description of fire detection, crew deployments, and suppression efforts for each fire that broke out. Also includes information on acreages involved and fire behavior observed.			
125	Janke, Robert A.	no date	Permanent Plot locations for Stanley Ridge Burn	ISRO
	Twenty permanent plot locations were installed at the 1988 Stanley Ridge Fire, ten along the ridge top and ten more in the open meadow area. This page gives distance, bearing from plot number, aspect, slope and other information for each plot.			
126	Janke, Robert A.	1977	Year-end report of the research project on post-fire succession and tree species reproduction of Isle Royale National Park	ISRO
	no abstract available			
127	Janke, Robert A.	1977	Unpublished comments on fire management environmental assessment	ISRO
	Dr. Janke's comments on the fire management environmental assessment highlights some of the ecological differences between Isle Royale and the Boundary Waters Canoe Area in Minnesota and the age of the forests on Isle Royale.			
128	Janke, Robert A.	1979	Post-fire succession in the boreal forest of Isle Royale National Park; Proceedings of the Second Conference on Scientific Research in the National Parks, San Francisco, California	ISRO
	no abstract available			
129	Janke, Robert A.	1983	Long term post-fire vegetation monitoring of the recent Stanley Ridge Burn in Isle Royale National Park Progress report to the National Park Service	ISRO
	no abstract available			
130	Janke, Robert A.	1991	Progress Report on the Research Project Entitled Post-Fire Vegetation Monitoring of Two Recent Burns on Isle Royale National Park	ISRO
	During the summer of 1977, permanent vegetation plots were established at two burn sites on ISRO, Card Point and McGinty's Cove. Vegetation plots were established in both types of soil condition so that the effects of the presence or absence of the upper soil organic layer on post-fire vegetation establishment could be compared. This report deals with the vegetation monitoring effort which occurred in the summer of 1990. White birch, quaking aspen, big-tooth aspen and white spruce all have considerably greater seedling densities on burned soil than on unburned soil. Balsam fir has greater seedling densities on the unburned soil. Other measurements made included sapling densities from 3 meter circular plots, tree densities from 6 meter radius plots, and ground cover data from square quadrants on burned and unburned soil. Early plant invaders on burned and unburned soils are listed. The study shows that the vegetation is still changing relatively rapidly, and that post-fire succession on burned soil is very different from that on unburned soil.			
131	Janke, Robert A.	1992	Progress report on the research project entitled post-fire vegetation monitoring of the recent Stanley Ridge burn in Isle Royale National Park	ISRO
	This report summarizes results of the 1991 post-fire vegetation sampling on the Stanley Ridge burn in Isle Royale National Park, a prescribed natural fire which occurred during the summer of 1988. Ten plot reference points were established in the jack pine forested portion of the burn, and 10 additional reference points were established within the open rocky meadow on the south-east facing slope of the ridge. Thus 10 vegetation plots were established in each of two distinctly different ecosystems. Counts of tree and tall shrub species of sapling size and tree size were made within the plots and stems were checked for moose browse. Percent cover of ground cover plants was estimated and percentage of the ground area covered by exposed rock was estimated. Results indicated that no tree survived the fire in either ecosystem. Since the fire, large numbers of jack pine and quaking aspen have invaded the former jack pine forest, but in the open meadow seedlings are scarce. All stems had been browsed by moose. Ground cover on the ridge top is highly dominated by blueberry.			

132	Janke, Robert A.	1993	Progress report on the research project entitled post-fire vegetation monitoring of the recent Stanley Ridge burn in Isle Royale National Park	ISRO
	This report summarizes results of the 1992 post-fire vegetation sampling on the Stanley Ridge burn in Isle Royale National Park, a prescribed natural fire which occurred during the summer of 1988. Ten plot reference points were established in the jack pine forested portion of the burn, and 10 additional reference points were established within the open rocky meadow on the south-east facing slope of the ridge. Counts of tree and tall shrub species of sapling and tree size were made within plots and stems were checked for moose browse. Percent cover of ground cover plants was estimated. Results: No woody plants in the tree stage of development were found in the sampling areas. Quaking aspen continued to have the greatest sapling density, although it was found only on the ridge top. Seedlings of tree and tall shrub species increased considerably between 1991 and 1992. Moose browsed on all the seedling and sapling species except jack pine. Most ground cover species increased in density between 1991 and 1992; on the ridge top blueberry still dominated, while serviceberry dominated on the open southeast slope.			
133	Janke, Robert A.	1994	Progress report on the research project entitled post-fire vegetation monitoring of the recent Stanley Ridge burn in Isle Royale National Park	ISRO
	This report summarizes results of the 1993 post-fire vegetation sampling on the Stanley Ridge burn in Isle Royale National Park, a prescribed natural fire which occurred during the summer of 1988, and compares those results with the results of the 1991 and 1992 sampling. Counts of tree and tall shrub species of sapling tree size within each plot were made, and all stems were checked for moose browsing. Percent cover of ground cover plants was estimated. Results: No woody plants in the tree stage of development were found in the sampling areas. The density of woody plants in the sapling stage increased considerably over 1992 for several species, especially jack pine. Quaking aspen continues to show a steady increase in sapling density. Seedlings of tree and tall shrub species showed a continued increase in both ecosystems. Moose browsed on all the seedling and sapling species except jack pine. Blueberry still is the dominant ground cover on the ridge top, while serviceberry was the dominant species in all size categories on the open southeast slope.			
134	Janke, Robert A.	1995	Progress report on the research project entitled 'Long term post-fire vegetation monitoring of the recent Stanley Ridge burn in Isle Royale National Park'	ISRO
	This is the fourth annual report describing the progress made on a research project dealing with the monitoring of vegetation within a recently burned area in Isle Royale National Park. The primary objective is to determine what vegetation invades the area following a fire and how this vegetation changes with time after the fire. This report summarizes results from 1994 and compares these results to 1991, 1992, and 1993.			
135	Janke, Robert A.	1996	Progress report on the research project entitled 'Long term post-fire vegetation monitoring of the recent Stanley Ridge burn in Isle Royale National Park'	ISRO
	This report describes the progress made on a research project dealing with the monitoring of vegetation within a recently burned area in Isle Royale National Park. The primary objective is to determine what vegetation invades the area following a fire and how this vegetation changes with time after the fire. The fire was a lightning ignited in 1988 and before it was extinguished by natural causes, 75 acres were burned. Initial vegetation sampling was done in 1991 and has been done annually since.			
136	Janke, Robert A.	1997	Progress report on the research project entitled 'Long term post-fire vegetation monitoring of the recent Card Point burn in Isle Royale National Park'	ISRO
	This report deals with the most recent monitoring of the vegetation on a small recently burned area, Card Point, on Isle Royale National Park. This ten acre fire was a natural lightning-caused fire which burned to a natural extinction. Permanent vegetation plots established in 1977 were monitored to measure successional changes in different soil types within the burn area. Tree and shrub species were measured; stem counts were made and stem heights measured. Low ground cover vegetation and seedlings were sampled. The results section identifies the most frequent post-fire invading trees and compares seedling densities on burned and unburned soils. Sapling densities were calculated for each species. The effect of moose on the vegetation in these areas is also discussed.			

137	Janke, Robert A.	1998	Progress report on the research project entitled (final version) long term post-fire monitoring of the recent McGinty's Cove burn in Isle Royale National Park	ISRO
	This report deals with the most recent monitoring (Summer, 1997) of the vegetation on a small recently burned area on Isle Royale National Park. The burn occurred in 1975 on a steep slope of a ridge near McGinty's cove on the northwest shore and at the southwest end of Isle Royale. The approximate area of the burn was 2 acres. It was a natural lightning-caused fire which the National Park Service allowed to continue to burn to a natural extinction. During the summer of 1977 we established permanent vegetation plots on the burn site so that successional changes could be monitored. These were randomly located along a series of equally-spaced parallel lines. The vegetation in the plots has been monitored in the summers of 1977, 1978, 1979, 1980, 1982, 1990, 1997.			
138	Janke, Robert A.	2000	Progress report on the research project entitled long term post-fire monitoring of the recent Stanley Ridge burn in Isle Royale National Park	ISRO
	This report described the progress made on a research project dealing with the monitoring of vegetation within a recently burned area in Isle Royale National Park. The primary objective is to determine what vegetation invades the area following a fire and how this vegetation changes with time after the fire. &. The fire was lightning0caused and occurred during the summer of 1988, on Stanley Ridge on the northwest end of Isle Royale. Before extinguished by natural causes, the area burned spread over approximately 75 acres. &. The initial vegetation sampling of this burn occurred during the summer of 1991. The area was again sampled during the summers of 1992, 1993, 1994, 1995, 1998, 1999. This report will discuss the results of the 1998/1999 sampling and will compare these with the result of the sampling in 1991, 1992, 1993, 1994, and 1995.			
139	Janke, Robert A., Lowther, John L.	1979	Post-fire succession in the boreal forest type of Isle Royale National Park	ISRO
	Post-fire successional trends in tree species composition, forest inflammability, and ground cover species composition in the boreal forest type of Isle Royale NP were studied by comparison of these parameters in approximately 200 forest stands of different age. Forest plots were randomly located along transects, stands were aged with an increment borer, and various measures of percent cover for vascular species and microhabitat features (for comparisons of forest floor fuel in different stages of succession) on the forest floor were obtained. Results indicate a shift in dominance from white birch and/or quaking aspen to white spruce and balsam fir with increasing stand age. The inflammability of the forest is shown to increase with time. Vascular ground cover plants also undergo marked changes. Most species increase progressively with time, decrease progressively with time, or rise to a peak value at intermediate ages and decline again as maturity is approached.			
140	Janke, Robert A., Lowther, John L.	1981	Post-fire succession in the boreal forest type of Isle Royale National Park; Proc 2nd conference of research in the National Parks, San Francisco	ISRO
	Post fire successional trends in tree species composition, forest flammability, and ground cover species composition were studied by comparison of these parameters in approximately 200 forest stands of different age. Results indicate a shift in dominance from white birch and/or quaking aspen to white spruce and balsam fir. The inflammability of the forest is shown to increase with time. Vascular ground cover plants also undergo marked changes. Most species increase progressively with time, decrease progressively with time, or rise to a peak value at intermediate ages and decline again as maturity is approached.			
141	Janser, R.F., Ward, P.C., compilers	1995	Proceedings - impacts of fire on the landscape, a science workshop	VOYA
	This workshop was sponsored by the Fire Science and Technology Unit of OMNR's Aviation, Flood, and Fire Management Branch, to bring together people working in the field of fire management, fire ecology, and landscape ecology. The goal was to provide an informal opportunity to discuss the theme of achieving a better understanding of the impact of fire on forest landscapes, and to provide an opportunity for researchers and scientists interested in this field to meet and exchange ideas and promote opportunities for collaborative work.			
142	Johnson, E.A.	1992	Fire and vegetation dynamics: studies from the North American boreal forest	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	"This book sets out to [describe the "causal connection between the behavior of fire and its ecological consequences"] by assembling the relevant studies of fire intensity, rate of spread, fuel consumption, fire frequency, and fire weather in the North American boreal forest. The central thesis is that [this] forest has at least four wildfire characteristics that are important in understanding the dynamics of its plant populations: the large size of the burns with respect to dispersal distances, the short recurrence time of fire with respect to tree life spans, the high mortality of plants due to the predominance of crown fires, and a good germination surface due to the large area of the forest floor which is covered by ash."			

143	Johnson, E.A., Miyanishi, K., Bridge, S.R.J.	2001	Wildfire regime in the boreal forest and the idea of suppression and fuel buildup; Conservation Biology	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	The explanation often given for the large wildfires that have burned each year in North America in the last two decades is that fire suppression after the 1950s produced a buildup of fuel and changed the landscape-age mosaic, creating conditions for catastrophic fires. &. Unfortunately, this fuel-buildup idea has been uncritically and inappropriately applied to closed-canopy ecosystems that have always have crown-fire regimes. &. We show here that the idea of fuel buildup is also invalid for the boreal and sub-alpine forest, another closed-canopy ecosystem with a crown-fire regime.			
144	Jordan, Peter A.	1977	Unpublished comments on fire management environmental assessment	ISRO
	Dr. Jordan's comments on the new fire management plan and environmental assessment.			
145	Keane, R.E., Garner, J.L, Schmidt, K.M., Long, D.G., Menakis, J.P., Finney, M.A.	1998	Development of input data layers for the FARSITE fire growth model for the Selway-Bitterroot wilderness complex, USA	VOYA
	Fuel and vegetation spatial data layers required by the spatially explicit fire growth model FARSITE were developed for all lands in and around the Selway-Bitterroot Wilderness Area in Idaho and Montana. Satellite imagery and terrain modeling were used to create the three base vegetation spatial data layers of potential vegetation, cover type, and structural stage. Fire behavior fuel models and crown characteristics were assigned to combinations of base layer categories on these maps by local fire managers, ecologists, and existing data. FARSITE fuels maps are used to simulate growth of prescribed natural fires in the wilderness area, aiding managers in the planning and allocation of resources. An extensive accuracy assessment of all maps indicated fuels layers are about 60 percent accurate. This methodology was designed to be replicated for other areas.			
146	Kessell, S.R., Fischer, W.C.	1981	Predicting postfire plant succession for fire management planning	VOYA
	Methods of organizing fire-related plant succession information into basic succession models are presented. Choice of resolution levels, data base, accuracy requirements, and methods are related to fire management needs and available information.			
147	Kilgore, B.M., Curtis, G.A.	1987	Guide to understory burning in ponderosa pine - larch - fir forests in the intermountain west	VOYA
	Summarizes the objectives, prescriptions, and techniques used in prescribed burning beneath the canopy of ponderosa pine stands, and stands of ponderosa pine mixed with western larch, Douglas-fir, and grand fir. Information was derived from 12 districts in two USDA Forest Service Regions and seven National Forests in Montana and Oregon.			
148	Kilgore, B.M., Heinselman, M.L.; Unknown	no date	12: fire in wilderness ecosystems; unknown	APIS, ISRO, SLBE, VOYA
	This is a chapter from a book. The chapter is titled, ‘Fire in Wilderness Ecosystems’, and addresses fire occurrence and behavior; objectives of wilderness fire management; wilderness fire management planning, operations, and examples; fire-dependent ecosystems in the American wilderness; trends; and future needs.			
149	Klick, Kenneth Frank	1988	Proposal for the research burn at Cowles Bog	INDU
	This proposal recommends that fire be re-introduced to the Cowles Bog Wetland Complex to reclaim and perpetuate the natural qualities of a portion of the area. The botanical resources of the wetland are examined, and the specifics of a proposed burn is mapped and outlined, with a list of the state endangered, rare, or special vegetation within the burn area. The fauna and soils of the area are also examined, and the role of fire in Cowles Bog is described.			
150	Knutson, Randy; Fox, Lissa	1992	Managing prescribed fire with GIS; highlights of natural resources management 1991	SACN
	The article describes the use of GIS layers in planning prescribed fires at Indiana Dunes National Lakeshore.			
151	Kozlowski, T.T., Ahlgren, C.E., editors	1974	Fire and ecosystems; Physiological Ecology: a series of monographs, texts, and treatises	VOYA
	Papers on fire's effects on various components of ecosystems...			
152	Kramer, Ari	1999	Brush fire scorches 70 acres of Gary parkland; Post-tribune	INDU
	The article describes a brush fire that was started along the Marquette Trail of Indiana Dunes National Lakeshore.			

153	Krumenaker, Robert J.	1986	Fire management at Isle Royale	ISRO
	Unpublished paper presented at the fourth conference on science in the national parks and equivalent reserves, Fort Collins, CO. The National Park Service exercised a vigorous fire suppression policy from the time of Park establishment in the 1930s until 1981; a large wildfire in 1936 however, affected 19% of Isle Royale. The low occurrence of both wildfires and natural ignitions since that time has left the park with essentially natural conditions. An approved natural fire management policy was instituted in 1981, but there have been no major ignitions since that time. Prescribed fire, while authorized, has not been used due to the lack of detailed historical fire research and the relatively undisturbed nature of the current forest system. The colonization of Isle Royale by moose in the early 1900's has caused an alteration in the forest structure from presettlement times. Changes in the natural fire regime need to be more fully investigated. The implications for fire management are intriguing, since "natural" forces are apparently leading the island biota along successional pathways that differ from those known from the historical record.			
154	Krumenaker, Robert J.	1988	Stanley fire report	ISRO
	A lighting strike on Friday, July 15, 1988 ignited a fire on the Stanley Ridge in ISRO. After reviewing the Fire Management Plan, fire prescription, fuels, likely fire weather and behavior and management situation, the Stanley Fire was declared a Prescribed Natural Fire. The fire was declared out six weeks later after burning approximately 80 acres. This report includes a Fire Summary and Narrative, Cost Summary, Escaped Fire Situation Analysis, TF-1202 Fire Report, Aircraft Use Report, Fire Weather Data sheets, press clippings, and a map.			
155	Krumenaker, Robert J.	1992	Fire management plan	ISRO
	This Fire Management plan is an appendix to ISRO's Resource Management Plan (1981). It implements the course of action described in the Resource Management Plan's fire management project statement which recommends that lightning-caused fires be permitted to burn under specific environmental and management conditions within designated areas for the purpose of achieving predefined resource management objectives. Management-ignited prescribed fires may be used under strictly controlled conditions to meet those objectives. Lightning- or management-ignited fires which do not meet these criteria, or endanger human safety, property, or critical natural or cultural resources, will be suppressed. All human-caused fires will be suppressed. The plan is the primary guide for all wildland fire management actions within ISRO, including response to wildfire and the conduct of management-ignited and prescribed natural fires. Although the plan provides specific direction for implementing a fire management program at ISRO, it is also a flexible document that will change in response to increasing knowledge of fire behavior and effects in the park's ecosystem.			
156	Krumenaker, Robert J.	1992	Environmental assessment for the fire management plan: Isle Royale National Park, Michigan	ISRO
	This Environmental Assessment outlines the need for a wildland fire management program, the recommended program and alternatives to it, and analyzes the environmental impacts of the recommended program and each alternative. The National Park Service recommends that lightning-caused fires be permitted to burn under specific environmental and management conditions within designated areas of Isle Royale National Park for the purpose of achieving predefined resource management objectives. The proposal also recommends that management-ignited prescribed fires be used under strictly controlled conditions to meet those objectives. Lightning- or management-ignited fires which do not meet these criteria, or endanger human safety, property, or critical natural or cultural resources, will be suppressed. All human-caused fires will be suppressed. This file also contains public comments generated during the assessment process and documentation labeled "Finding of No Significant Impact".			
157	Kwilosz, John R., Knutson, Randy	1996	Prescribed fire management of Karner blue butterfly habitat at Indiana Dunes National Lakeshore; 23rd natural areas, 15th North American prairie, and Indiana Dunes ecosystems conferences: Abstracts	INDU
	The abstract describes the different research projects being conducted at Indiana Dunes National Lakeshore to create a fire management plan to increase Karner blue butterfly habitat.			
158	Kwilosz, John R., Knutson, Randy L.	1999	Prescribed fire management of Karner blue butterfly habitat at Indiana Dunes National Lakeshore; Natural areas journal	INDU
	Fire is required to maintain the Karner blue butterfly's sole larval host, wild lupine. The staff at Indiana Dunes National Lakeshore has developed a fire plan that will minimize the damaging effects of fire on the Karner blue butterfly population while helping to maintain its habitat.			

159	Latham, D.J., Rothermel, R.C.	1993	Probability of fire-stopping precipitation events	VOYA
	Fire managers in the Northwestern United States are often confronted with the problem of determining when precipitation might stop an ongoing fire. The possibility that a useful probability for fire-stopping precipitation could be developed from historical weather records was investigated. Persons familiar with weather and fire behavior suggested a fire-stopping precipitation criterion of "at least 0.5 inches of precipitation in 5 days or less." Daily precipitation data from four fire weather stations for the period 1970 to 1985 were used to estimate the chance that the criterion would be satisfied by a specified date in the fire season. The Weibull probability distribution was found to be an excellent fit for the problem. The method of fitting the distribution to the data is described and results given for four weather stations in the Northern Rocky Mountains. This method can be applied to other "fire-stopping" criteria using the same technique.			
160	Latham, D.J., Schlieter, J.A.	1989	Ignition probabilities of wildland fuels based on simulated lightning discharges	VOYA
	Ignition of wildland fine fuels by lightning was simulated with an electric arc discharge in the laboratory. The results showed that fuel parameters such as depth, moisture content, bulk density, and mineral content can be combined with the duration of the simulated continuing current to give ignition probabilities. The fuel state parameters of importance and the ignition probabilities were determined using logistic regression. Graphs, tables, formulas, and a FORTRAN program are given for field use.			
161	Loope, Walter L.	1985	Pre- and post-logging fire regimes of Pictured Rocks National Lakeshore	PIRO
	"White settlement and resource exploitation around the turn of the twentieth century had a significant impact on the pre-columbian ecosystem. Extensive logging of white and red pine throughout the region and the subsequent burning of logging slash removed most fuel, growing stock and seed source and altered soil profiles in some areas. Clear and selective cutting of the upland hardwoods and swamp conifers in the 1920's and 1930's altered age structure of stands. ... the influence of fire as an ecosystem process in the vicinity of Pictured Rocks becomes twofold: what role did fire play prior to the cutover and what role does fire play at present?"			
162	Loope, Walter L.	1986	Pictured Rocks National Lakeshore natural resource management plan: overview and needs section; Pictured Rocks National Lakeshore resource management plan	PIRO
	Natural resource management, monitoring, and research needs for Pictured Rocks National Lakeshore, MI are described and prioritized, based on the guidelines in the enabling legislation and in the General Management Plan. The needs are listed as: dune monitoring, boundary surveying, backcountry management of campsites and trails, water resources management, dune management adjacent to County Road H-58, vegetation management, fisheries management, wildlife management, fire management, sea lamprey management, acid precipitation management, air quality monitoring, and the photo point project. A description of each problem and thorough background information about each situation is presented. Where applicable, in-progress reports and funding status are provided.			
163	Loope, Walter L.	1991	Interrelationships of Fire History, Land Use History, and Landscape Pattern within Pictured Rocks National Lakeshore, Michigan; The Canadian Field-Naturalist	PIRO
	Permanent transects were established throughout Pictured Rocks National Lakeshore, MI, and vegetation data were gathered using the point centered quarter method. No evidence of fire was found in the upland, deciduous woods, but in the pine-dominated forests that thrive on the excessively drained, sandy soils in isolated patches there were fire-scarred, living red (*Pinus resinoa*) and white pine (*P. strobus*). Tree rings were counted from partial cross-sections of fire scarred, living pines and from fire-scarred, logging era stumps. Data about incidence of fire and the number of years between fires were analyzed: there have been no significant fires in Pictured Rocks National Lakeshore since European settlement, but prior to that, the average fire occurrence rate was one in 21.8 yrs. It is hypothesized that the difference is due to ignition by native peoples at their summer camps at the mouths of rivers and to the more recent suppression of fire by European cultural practices and public policy. A comparison between present vegetation patterns and those of the mid 19th century, reconstructed from field notes of the original surveyors, is also discussed.			
164	Loope, Walter L.	1993	Native peoples as ignition sources in coastal conifer forests of the Upper Great Lakes (ABSTRACT); Ecological Society of America Bulletin (Abstracts)	PIRO
	Frequency of fire before European settlement was determined by examining fire scarred stumps and fire scarred, living pines from pine forest patches along the shore of Lake Superior. Partial sections of trees were removed and tree rings were counted. Average time between ground fires was 22.9 yrs. Records of regional lightening strikes indicates that the fires were too frequent for all to have been caused by lightening. Historical documents, soil properties, and fuel loading patterns support the hypothesis that native peoples were involved in the ignition of fires at their summer camps near the mouths of rivers.			

165	Loope, Walter L., Anderton, John B.	no date	Cultural mediation of fire regime in coastal pine forests of Lake Superior	PIRO
	The report discusses the possibility of fire ignition by native peoples between 1700 and 1900.			
166	Loope, Walter L., Anderton, John B.	1993	Cultural mediation of fire regime in coastal pine forests of Lake Superior (ABSTRACT); Ecological Society of America Bulletin (Abstracts)	PIRO
	The role of native peoples in ignition of wildland fires in isolated pine patches along the Great Lakes' shorelines is inferred from archeological evidence about Ojibwa seasonal camps and from fire scarred trees and stumps. Pine forests grow in isolated patches on excessively drained soils separated by deciduous forests along the shores of the upper Great Lakes. These pine patches usually surround the mouths of small rivers or streams where there is evidence that Ojibwa people had fishing camps. Fire scars indicate that understory fires occurred every 5-50 years prior to European settlement, yet lightening fire occurrence is not sufficient to explain these numbers of fires. The earliest General Land Office survey notes in 1840 indicate that Miners Basin of what is now Pictured Rocks National Lakeshore, MI and the tombolo of Grand Island (presently Grand Island National Recreation Area, MI) were "park-like" (forested with little woody understory). Preliminary findings suggest that native peoples managed their resources with fire and that when their cultural patterns were disrupted due to the European settlement, the composition of the understory changed.			
167	Loope, Walter L., Anderton, John B.	1995	Human influence on fire regime along Upper Great Lakes Coasts (ABSTRACT); Ecological Society of America Bulletin (Abstracts)	PIRO
	Isolated patches of pine forests along the shores of the Great Lakes in northern lower Michigan and upper Michigan are suitable for investigating ignition sources of periodic fires. Partial cross-sections of living, fire scarred red pine (*Pinus resinosa*) and logging era stumps from 45 small, isolated forests were examined to confirm fire scars and to count tree rings. From 1780-1910 the average time between ground fires was 16.3 yrs. Records show that lightening is too infrequent to account for these numbers of fires. Anthropological and historical evidence suggests that native people used fire to manage their resources and that when European settlement altered their cultural practices, the incidence of fire in these pine forests dropped to nearly zero.			
168	Loope, Walter L., Anderton, John B.	1998	Human vs. lightning ignition of presettlement surface fires in coastal pine forests of the upper Great Lakes; American midland	PIRO, SLBE
	Thirty-nine patches of coastal pine forest along the shores of Lakes Superior, Michigan, and Huron were examined for the presence of fire scarred, logging era stumps. Red pine stumps and living, fire scarred P. resinosa (rare) were sectioned for fire scars. Evidence of fire was found at all 39 sites, and 29 patches contained multiple fire scars that provided data about fire intervals. Pre-logging era fire intervals averaged less than 22 yrs compared to an average post-logging era fire interval of more than 75 yrs. Frequency of lightening strikes (from data from other researchers) in the upper Great Lakes region varies from 0.2 to 1.9 lightening fires/year/100,000 hectares. It is hypothesized that lightening is too infrequent to have been the ignition source for all the pre-logging fires and that planned or accidental burning by native Americans (Anishnabeg) at their seasonal camps was the source for most or all of the pre-logging era (1750-1900) fires in the pine patches. Maps indicate locations of coastal pine forest pockets along the southern coast of Lake Superior and the northern coast of Lake Michigan. Sites at Pictured Rocks National Lakeshore are featured in separate map.			
169	Lotan, J.E., Brown, J.K.	1985	Fire's effects on wildlife habitat - Symposium Proceedings	VOYA
	A compilation of 11 papers in which authorities discuss the impacts of fire on wildlife habitat and wildlife populations. Presentations cover bobwhite quail, nongame birds, white-tailed deer, bighorn and Stone's sheep; and the response to burning of curlleaf cercocarpus, aspen, evergreen ceanothus, and antelope bitterbrush.			
170	Lynham, T.J., Stocks, B.J.; Tall Timbers Research Station	1991	The natural fire regime of an unprotected section of the boreal forest in Canada; high intensity fire in wildlands: management challenges and options; 17th Tall Timbers Fire Ecology Conference	VOYA
	From 1982 to 1984, we investigated the fire periodicity of the boreal forest of northern Ontario on an upland jack pine site. The data suggest that over a 160-year period, the shortest and longest times between major fires were 5 and 30 years, respectively. The average fire periodicity was 20 years.			
171	Main, W.A., Straub, R.J., Paananen, D.M.	1982	FIREFAMILY: fire planning with historic weather data	VOYA
	This user's guide will help fire managers interpret the output from FIREFAMILY, a computer program that uses historic weather data for fire planning. The guide describes options within the program and explains various tables and graphs necessary for planning. It also provides details which computer specialists need to run the program.			

172	McArdle, Michael	1998	Firefighters torch Lakeshore; Post-tribune	INDU
	The article consists of three photos of park staff using prescribed burns to maintain vegetation at Indiana Dunes National Lakeshore. The captions describe the location and purpose of the fires.			
173	Mccaffrey, Keith R., Irving, Frank D.	1966	Forest fires in Koochiching County- prevention and control	VOYA
	State and private forest fire control efforts were studied through review of publications and interviews with fire management officials to determine patterns of occurrence, severity, spread and control methods for the Koochiching county area.			
174	Methven, Ian R., Murray, W.G.	1974	Using fire to eliminate understory balsam fir in pine management; The Forestry Chronicle	VOYA
	"A major problem in the management of red and white pine is obtaining satisfactory regeneration where undesirable understory species such as balsam fir and beaked hazel are plentiful. .... Since the ecological role of fire in the regeneration and perpetuation of both species is well recognized, it makes both biological and economic sense to harness this natural force if at all possible, and apply it in forest management. Studies were undertaken to evaluate fire as an agent for the control of balsam fir understories in pine and pine-mixedwood cover types. Although this study was not large enough to produce definitive prescriptions for the use of fire to control balsam fir, the results were sufficient to be worth reporting as a step toward this goal."			
175	Miller, Roswell K.	1977	A fire prescription for Isle Royale National Park	ISRO
	Analyzes fire weather indices as they occurred on ISRO in 1976 in order to come up with a fire prescription for Isle Royale as part of the assessment process for a new fire management plan for ISRO. The prescription is presented on pages 36 through 40.			
176	Miller, Roswell K.	1977	A fire prescription for Isle Royale National Park	ISRO
	Analyzes fire weather indices as they occurred at four locations on Isle Royale in 1976 in order to come up with a fire prescription for Isle Royale. A fire prescription for use over the whole island is presented.			
177	Miller, Roswell K.	1978	The Keetch-Byram Drought Index and three fires in Upper Michigan, 1976; Proceedings of the Fifth National Conference on Fire and Forest Meteorology, March 14-16, 1978, Atlantic City, N J	ISRO
	no abstract available			
178	MNICS Prescribed Fire Working Team	2002	Minnesota smoke management plan	GRPO, MISS, PIPE, SACN, VOYA
	"Prescribed fire and managed wildfire has been used in Minnesota for many years to improve and maintain natural resources. Those agencies that agree to this Smoke Management Plan (SMP) agree to apply the provisions of this plan to fires that they ignite or to naturally ignited fires that they manage. This SMP is based on Section VI. 'Smoke Management Programs' of the U.S. Environmental Protection Agency's 'Interim Air Quality Policy on Wildland and Prescribed Fires.' The purposes of SMPs are to mitigate the nuisance and public safety hazards posed by smoke intrusions into populated areas; prevent deterioration of air quality and National Ambient Air Quality Standards violations; and address visibility impacts in federal mandatory Class I areas. ...."			
179	Nalder, I.A., Wein, R.W., Alexander, M.E., De Groot, W.J., Groot - W.J. De Groot	1997	Physical properties of dead and downed round-wood fuels in the boreal forests of Alberta and Northwest Territories; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, VOYA
	Dead and downed woody fuels in forests are commonly estimated using the line transect method, which requires appropriate values for specific gravity, piece tilt angle, and piece diameter. We present data for these variables for six commercially important tree species based on extensive surveys of slash and naturally fallen dead wood in four regions of the western Canadian boreal forest. The considerable variation by diameter size class, species, cover type, and, to a lesser degree, region suggests that specific values will improve fuel load estimates. We combine the three variables into a single factor so that fuel load (megagrams per hectare) can be simply calculated by multiplying this factor by the number of intersects per meter of sample transect.			
180	National Park Service	1980	General management plan: Indiana Dunes National Lakeshore / Indiana	INDU
	The plan outlines the goals and strategies for managing the natural and cultural resources of Indiana Dunes National Lakeshore.			

181	National Park Service	2001	Fire monitoring handbook 2001	VOYA
	The fire monitoring program described in this Fire Monitoring Handbook (FMH) allows the National Park Service to document basic information, to describe trends, and to ensure that each park meets its fire and resource management objectives. .... This handbook is intended to facilitate and standardize monitoring for National Park Service units that are subject to burning by wildland or prescribed fire. [It] defines and establishes levels of monitoring activity relative to fire and resource management objectives and fire management strategies.			
182	National Park Service	2003	Fire management plan: preliminary draft environmental	SLBE
	Four alternatives for fire management are addressed in the fire management plan for Sleeping Bear Dunes National Lakeshore. The preferred alternative suppresses all wildland fires on the mainland, allows wildland fire use on Manitou Islands, and allows prescribed fire on the islands and the mainland. The previous fire management plan (1989) forbids wildland fire use and prescribed fire. An analysis of the potential environmental effects of implementing each of the alternatives is included. The following impact topics were derived from park staff and public scoping: geology and soils, water resources, floodplains and wetlands, air quality, vegetation, wildlife and fisheries, threatened and endangered species, wilderness, noise, cultural resources, land use, human health and safety, public services, park facilities and operations, visitor use and experience. Public scoping and consultation for the development of the fire management plan is summarized. Appendices include environmental laws and regulations and scoping documents.			
183	Nickas, G.	1998	Wilderness fire; wilderness watcher	APIS, ISRO, SLBE,
	The role for natural fire in shaping Wilderness ecosystems may be the greatest challenge facing managers and wilderness advocates today. In this issue of Wilderness Watcher we've attempted to provide a glimpse into some of the issues and perspective involved in sorting out the appropriate Wilderness fire policy.			
184	Nodvin, S.C., Waldrop, T.A., Editors	1991	Fire and the Environment: Ecological and Cultural Perspectives: Proceedings of an International Symposium	VOYA
	This was an international symposium held on March 20-24, 1990, in Knoxville, TN. The meeting was attended by over 150 researchers, land managers, and wildlife managers. Forty-one papers based on oral presentations are included under four categories: Fire Ecology; Fire Management; Cultural; and Fire History. In addition, three papers are presented from a special session on the 1988 fires in the Greater Yellowstone Area and fourteen papers are presented from a poster session.			
185	Norum, R.A., Miller, M.	1984	Measuring fuel moisture content in Alaska: standard methods and procedures	VOYA, WRST
	Methods and procedures are given for collecting and processing living and dead plant materials for the purpose of determining their water content. Wildland fuels in Alaska are emphasized, but the methodology is applicable elsewhere. Guides are given for determining the number of samples needed to attain a chosen precision. Detailed procedures are given for collecting fuel samples in the field, transporting them safely, and handling them in the laboratory. General guidelines for all live fuels and specific techniques for individual species are given.			
186	Nwcg Training Working Team	1996	Wildland fire suppression tactics guide	VOYA
	This guide provides basic tactical information on suppressing wildland fires. It also provides information on wildland fire fuels, fire behavior, and tactics by geographic areas of the United States. It can be used by the beginning firefighter to learn more about tactics or determining exactly where and how to build a control line and what other suppression measures are necessary to extinguish a fire. It can be used a review of suppression tactics for the advanced firefighter. The tactics reference guide is intended to be a supplement, but not a substitute for wildland fire training. It does not qualify a person for any wildland firefighting position. This guide does not include nor address the constraints on firefighting imposed by environmental laws and regulations; i.e., designated wilderness areas, wilderness study areas, threatened and endangered species, cultural and archaeology sites, air quality, etc.			
187	Oelfke, J.G.; Brown, J.K., Mutch, R.W., Spoon, C.W., Wakimoto, R.H., Technical Coodinators	1995	Prescription for a wilderness: Isle Royale National Park; symposium on fire in wilderness park management; general technical report	ISRO
	A discussion of why Isle Royale National Park is a prime location for an extensive prescribed natural fire (wildland fire use) program.			
188	Ohmann, Lewis F., Grigal, David F.	1981	Contrasting vegetation responses following two forest fires in northeastern Minnesota; The American Midland Naturalist	VOYA
	"Response of *Pinus banksiana* Lamb. forest communities during the first growing season following a spring fire (three communities) was contrasted with response following a summer fire (two communities) in northeastern Minnesota. Differences in both quantity and quality of vegetation were related to degree of destruction of the forest floor." (Excerpt from author's abstract)			

189	Parmeter, Dean	no date	Interview with Dean Parmeter regarding forest fires in 1936	VOYA
	Portions of a 1975 oral history interview with Dean Parmeter which includes a description of activities surrounding a severe forest fire that engulfed a large portion of the Kabetogama Pennisula in 1936.			
190	Parsons, D.J.	1998	The dilemma of wilderness fire; Wilderness Watcher	APIS, ISRO, SLBE,
	Regardless of one's perspective on the appropriateness of prescribed burning in wilderness, the cost and resource constraints prohibit its use in the scale that would be required to restore fire to most wilderness acreage.			
191	Parsons, D.J., Landres, P.B.; Pruden, T.L., Brennan, L.A., editors	1998	Restoring natural fire to wilderness: how are we doing?; Fire in ecosystem management: shifting the paradigm from suppression to prescription; Tall Timbers Fire Ecology Conference	APIS, ISRO, SLBE, VOYA
	The restoration of natural fire to wilderness ecosystems poses a significant challenge to the federal land management agencies. Despite recognition of the role of natural fire, suppression continues to play a dominant role in wilderness fire policy for all four wilderness management agencies. Ways must be found to substantially increase the acreage burned through prescribed fire in wilderness.			
192	Payette, S.; Shugart, Herman H., Leemans, Rik, Bonan, Gordon B., editors	1992	Fire as a controlling process in the North American boreal forest (Chapter 5); A systems analysis of the global boreal forest	APIS, GRPO, ISRO, PIRO, VOYA
	Major patterns of plant communities and species distribution are induced by various disturbance regimes operating at different spatial and temporal scales. Fire disturbance in the boreal forest creates all sizes of canopy gap, and constitutes one of the most important community processes in vegetation development along complex environmental gradients. At the landscape level, ecological disturbances result in the spatiotemporal development of the vegetation mosaic composed of an assemblage of stand patches of different age, aerial extent, and floristic composition.			
193	Peterson, J., Leenhouts, B.	1998	What wildland fire conditions minimize emissions and hazardous air pollutants and can land management goals still be met?	APIS, INDU, ISRO, LIBO, SACN, SLBE, VOYA
	This paper is a discussion of wildland conditions and techniques that minimize pollutant emissions and is intended to provide interested readers with additional information on the subject. This paper was developed by members of an EPA sponsored workgroup in response to specific questions raised about smoke management in the development of a policy recommendation to EPA. In no way should any of the information in this paper be construed as an EPA requirement.			
194	Phillips, Zachary T.	1965	Fire on Isle Royale	ISRO
	History of the 1936 Siskiwit Burn, which burned 27,000 acres on Isle Royale. The photographs which accompanied this report became a part of the park's permanent photo collection as a part of the Isle Royale Research Project "Plant Succession Following Fire on Isle Royale". The archives copy of this paper still contains the original photographs.			
195	Pictured Rocks National Lakeshore	no date	Visitor use, resource management, and operations; unknown	PIRO
	Management alternatives to 5 categories of visitor use, resource management, and operations in Pictured Rocks National Lakeshore, MI are outlined. The categories include, but are not limited to, backcountry trails, campgrounds, disturbed areas, sensitive areas, vegetation, erosion, and fire.			
196	Pictured Rocks National Lakeshore	1979	Resources management plan, vegetation management program alternatives	PIRO
	A vegetation management plan is identified as necessary to Pictured Rocks National Lakeshore, MI because the Lakeshore is a long, narrow strip of land with a large perimeter that exposes the Lakeshore to outside influences, because the past logging and fire practices have modified vegetation, and because the cliffs and the Grand Sable Dunes sections of the Lakeshore are sensitive to erosion. Management plans and their alternatives are outlined for 6 facets of vegetation in the Lakeshore. They are: fire management, plant disease and pest management, roadside, trail, and hazardous vegetation management, endangered and threatened plant species management, exotic plant species management, and developed area vegetation management. Checklists of endangered and threatened plants in Michigan are included.			

197	Pictured Rocks National Lakeshore	1994	Fire suppression plan, Pictured Rocks National Lakeshore	PIRO
	The fire suppression plan at Pictured Rocks National Lakeshore, MI includes a list of fire prevention measures in campgrounds and during dry weather, preparation of staff to handle uncontrolled fire, fire behavior prediction in different forest types (conifer, mixed conifer/hardwoods, hardwoods, and wetlands), step-up manning plan (a plan to have ready equipment and manpower in different fire situations), fire detection, fire suppression, initial fire attack, extended fire attack, site rehabilitation, and recordkeeping. Areas of highest likelihood of fire occurrence (based on fuels and ignition sources) are identified as Becker and Henderson Farms, Miners Basin, Chapel Basin, Beaver Basin, Twelvemile Beach, Log Slide, and Abrahamson Farm.			
198	Pictured Rocks National Lakeshore	2003	Resource management plan 2003 [DRAFT]	PIRO
	The resource management plan describes the background and characteristics of Pictured Rocks National Lakeshore and addresses present resource status and resource management programs. Natural and cultural resource management goals, objectives, and values are discussed. Tables document natural and cultural resource baseline information. These include status and information sources for flora/fauna, rare biota, aquatic resources, landscape scale processes, disturbance regimes, soils, geology, visitor use, cultural themes, digital spatial data, and aerial photography. Natural and cultural resource issues, threats, and needs are examined. These include personnel needs and responsibilities, administrative activities, GIS development, integrated pest management, visitor use, interpretation, aquatic resources and fisheries, wildlife, vegetation and fire, air quality, earth science, backcountry, and ecosystems.			
199	Poe, Noel	1976	Individual fire report and supplementary case record "Card Point Fire"	ISRO
	no abstract available			
200	Poparad, Paulene	1996	Mission accomplished; The News-dispatch	INDU
	The article describes a prescribed burn that was set at Indiana Dunes National Lakeshore to encourage the sprouting of dormant seeds and to possibly restore Karner blue butterfly habitat.			
201	Raymond, Randall E.	1975	Postglacial lakes and recent forest fire history as exhibited in inland lake sediments on Isle Royale National Park, Michigan	ISRO
	Study of the forest fire history of Isle Royale reveals that the inland lakes sampled for charcoal analysis have different origins with respect to the higher water levels of ancestral Lake Superior. Comparing the diagrams of the sediment sequences and the diagrams of the Isle Royale shoreline at the Miniong and Nipissing high water stages, makes it possible to separate those basins covered by only Lake Minong from those covered by both Lakes Minong and Nipissing. The record of charcoal influx to the lake sediments indicates that fire has been an important ecological factor in the forest history of ISRO for at least the past 1,000 years. The average frequency between peak periods of charcoal influx does not vary significantly in three of the four lakes selected for charcoal analysis. However, problems with radiocarbon age determinations and low rates of sediment accumulation make it difficult to say whether these peaks represent one fire or a series of fires at close time intervals.			
202	Reeburg, Paul	1996	Voyageurs NP fire monitoring program review	VOYA
	In-house report from the program manager of the National Fire Effects Monitoring Program to Voyageurs NP staff. Presents comments and recommendations on the current fire management program in Voyageurs National Park.			
203	Reed, John	1999	Brush fires keep firemen busy; The Vidette times	INDU
	The article describes the fires occurring in and near Indiana Dunes National Lakeshore during the spring of 1999. Possible causes of the fire are also theorized.			
204	Reinhardt, T.E., Ottmar, R.D.	1997	Smoke exposure among wildland firefighters: a review and discussion of current literature	VOYA
	This paper reviews and summarizes literature about smoke exposure and the resulting adverse health effects among wildland firefighters. Many studies have been done on this problem between 1973 and 1995. Overall, the data indicate that smoke exposure at wildfires and prescribed fires is usually no more than an inconvenience, but on occasion it approaches or exceeds legal and recommended occupational exposure limits. Management action is necessary to bring all smoke exposures into compliance with occupational safety regulations.			
205	Remsoft	no date	BEHAVE user's guide	VOYA
	User's guide to BEHAVE fire behavior modeling software produced by the software manufacturer, Remsoft.			

206	Rogers, Stephen	1980	Fire history: Isle Royale National Park, 1936-1980	ISRO
	A student paper which does a nice job synthesizing information on the Isle's Forest History.			
207	Rogers, Stephen	1980	Isle Royale National Park fire history map 1936-1980	ISRO
	This map shows fires as they occurred from 1936 to 1980. Separates lightning caused fires from human-caused fires and shows the year in which each fire occurred. A separate inset map shows the extent of the large burn which occurred in 1936.			
208	Rothermel, R.C.	1992	Fire behavior nomograms	VOYA
	The "Fire behavior nomograms" are excerpted from "How to Predict the Spread and Intensity of Forest and Range Fires," Richard C. Rothermel, June 1983, with the exception of the nomogram for fuel model #7 which was update for this publication.			
209	Rothermel, R.C.	1983	How to predict the spread and intensity of forest and range fires	VOYA
	This manual documents procedures for estimating the rate of forward spread, intensity, flame length, and size of fire burning in forests and rangelands. Contains instructions for obtaining fuel and weather data, calculating fire behavior, and interpreting the results for application to actual fire problems.			
210	Rothermel, R.C., Rinehart, G.C.	1983	Field procedures for verification and adjustment of fire behavior predictions	VOYA
	The problem of verifying predictions of fire behavior, primarily rate of spread, is discussed in terms of the fire situation for which predictions are made, and the type of fire where data are to be collected. Procedures for collecting data and performing analysis are presented for both readily accessible fires where data should be complete, and for inaccessible fires where data are likely to be incomplete. The material is prepared for use by field units, with no requirements for special equipment or computers. Procedures for selecting the most representative fuel model, for overall evaluation of prediction capability, and for developing calibration coefficients to improve future predictions are presented. Illustrated examples from several fires are included. The material is a companion publication to the fire prediction manual titled, "How to predict the spread and intensity of forest and range fire," by R.C. Rothermel.			
211	Rowe, S.J., Scotter, G.W.	1973	Fire in the boreal forest; Quaternary Research	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	The boreal forest in North America owes much of its floristic and faunistic diversity to periodic fires ignited by lightning and by man since he appeared on the scene. The indirect evidences of burning in vegetation and soils, and recent direct observation of fires, are reviewed. Fire is shown to exert a significant effect on vegetational composition, on soil chemical properties and thermal regime, and on animal populations through the particular habitat of created. In turn, fire is itself influenced by the nature of geographic landscape ecosystems according to their surface forms, accumulations of organic materials, and susceptibility to drought. It is concluded that fire should be viewed as a normal ecological process in the boreal forest. A thorough understanding of its long-term role in terrestrial and aquatic ecosystems is needed.			
212	Ryan, K.C., Peterson, D.L., Reinhardt, E.D.	1988	Modeling long-term fire-caused mortality of douglas-fir; Forest Science	VOYA
	Mortality was determined in a stand of douglas-fir 8 years after 20 plots were treated with light surface fires. Logistic regression was used to model long-term mortality as functions of morphological variables measured shortly after burning. Independent variables were diameter at breast height, height of needle scorch, percentage of prefire crown volume scorched, season of burn, and the number of quadrants with dead cambium at 1.4 m bole height. Models may be used for planning prescribed fires and for salvaging fire-damaged Douglas-fir.			
213	Sando, Rodney W., Haines, Donald A.	1972	Fire weather and behavior of the Little Sioux fire	VOYA
	"In mid-May 1971, a northern Minnesota fire burned almost 15,000 acres of forest land. The extreme fire behavior it exhibited was the product of a number of described features. This paper documents the attendant fuel and weather conditions." (Abstract by author)			
214	Schimmel, Johnny, Granstrom, Anders	1996	Fire severity and vegetation response in the boreal Swedish forest; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	We studied plant survival and colonization over an experimental gradient, from fire lightly scorching the soil to fire consuming most of the organic soil layer, at two forest sites in northern Sweden. The gradient was achieved by adding different amounts of fuel to small plots that were burned in 1988 and 1989. Temperature was recorded at four soil strata during burning. We analyzed survival of seeds and rhizomes in the soil immediately after fire, and followed vegetation cover and seedling establishment until 1993. The results indicate that in boreal forest, depth of burn is a more important variable than fire front intensity for the understory vegetation, in contrast to the situation in ecosystems with little accumulation of organic matter on the mineral floor.			

215	Schmoldt, D.L., Peterson, D.L., Keane, R.E., Lenihan, J.M., Mckenzie, D., Weise, D.R., Sandberg, D.V.	1999	Assessing the effects of fire disturbance on ecosystems: a scientific agenda for research and management	VOYA
	A team of fire scientists and resource managers compiled scientific recommendations for future activities on (1) links among fire effects, fuels and climate; (2) fire as a large-scale disturbance; (3) fire-effects modeling structures; and (4) managerial concerns, applications, and decision support. Although we clearly need more large-scale fire-effects data, it would be better to improve and link existing models that simulate fire effects in a georeferenced format while integrating empirical data as they become available. This effort should focus on improved communication between modelers and managers and on predicting the interactions of fire and potential climatic change at very large spatial scales.			
216	Slaughter, K.W., Grigal, D.F., Ohmann, L.F.	1997	Carbon storage in southern boreal forests following fire	APIS, GRPO, ISRO, PIRO, VOYA
	We measured changes in carbon (C) after fire in 7 southern boreal upland forest stands during the 5 immediate post-fires years and 23 years after the fire. Dynamics of C differed among the stands. Data from either a single stands or a chronosequence in space rather than in time can lead to different conclusions than those from multiple stands through time.			
217	Smith, Norman F.	1936	Diary of a fire fighter	ISRO
	An account of experiences and observations the author had while acting as a CCC foreman during the Isle Royale fire in 1936.			
218	Smith, Norman F.	1937	A fire protection plan for Isle Royale National Park	ISRO
	The author of this thesis was employed at Isle Royale during the summer of the 1936 fire and his observations of the fire's progression and man's attempts to control it led him to write a proposed plan for fighting forest fires on Isle Royale. He addresses the obstacles Isle Royale presents to fighting forest fires and makes recommendations on methods of fire presuppression and recommendations for fire suppression.			
219	Soleim, David	1997	Prescribed burn plan for the Stanley Ridge burn	ISRO
	A plan for a prescribed fire in the Stanley Ridge area to replicate natural low-intensity fire in this pine ecosystem.			
220	Stanley, Donald	1988	Downed woody fuel load sampling guidelines, Indiana Dunes National Lakeshore	INDU
	This guide explains the methods used to sample downed woody fuels at Indiana Dunes National Lakeshore. Information provided from fuel load samples can be used to document prescribed burn units, identify hazard fuel loadings, and to construct fuel models to predict fire behavior. The guide specifically tells how to inventory weights, volumes, and depths of downed woody material. There is an equipment checklist for fuel load sampling, fuel load transect location descriptions, collection procedures, data sheets, notes on tallying, and possible problems and sources of error for sampling. A sample calculation for downed woody material is provided.			
221	Stanley, Donald	1988	Results of fuel load sampling, 1987-88 - Howes Prairie and Beverly Shores sampling areas, Indiana Dunes National Lakeshore	INDU
	Results of fuel load sampling at Howes Prairie and Beverly Shores at the Indiana Dunes National Lakeshore are given as data tables. Topographic maps show transect locations, and results for transect sampling are provided for total downed woody fuels, size class averages, litter depths, herbaceous fuels, and duff depths.			
222	Steigerwaldt, William M., Meyer, Merle P.	1979	Vegetation/fuel type mapping of Isle Royale National Park; remote sensing laboratory research report 79-1	ISRO
	The Vegetation/Fuel type classification scheme, under development by the U. S. Forest Service, is an attempt to combine collected forest fuel data and a vegetation map to formulate general forest fire management techniques. Two pilot projects, within the Boundary Waters Canoe Area and Isle Royale National Park, are Vegetation/Fuel Type Classifications initiated for the specific purpose of studying forest fire management on wilderness lands. Uses color infrared aerial photography at a nominal scale of 1:15,840. Stereoscopic interpretation was used throughout the vegetation and forest cover type mapping, resulting in a moderately detailed classification of the forest cover by species association, size class, and crown density. The data from this map has been added to the Park's GIS database and a copy of the map generated from it can be found in the ISRO Natural Resource Map Cabinet Drawer 4.			

223	Stocks, B.J.	1987	Fire potential in the spruce budworm-damaged forests of Ontario; The Forestry Chronicle	APIS, GRPO, ISRO, PIRO, SACN, VOYA
	An experimental burning program was carried out in Ontario between 1978 and 1982 to document quantitatively fire behavior in balsam fir killed by spruce budworm. Forest fire potential in budworm-killed balsam fir stands was shown to be significantly higher for a number of years following stand mortality.			
224	Stocks, B.J., Hartley, G.R.	1995	Fire behavior in three jack pine fuel complexes; Canadian forest fire danger rating system	APIS, GRPO, ISRO, PIRO, VOYA
	A full-color folded poster which "Visually depict[s] the range of fire behavior exhibited during the Ontario experimental burning programs conducted in three distinct jack pine fuel complexes: logging slash, mature stands, and immature stands." Text describing methods and results is included on the poster.			
225	Stocks, B.J., Lawson, B.D, Alexander, M.E., Van Wagner, C.E., McAlpine, R.S., Lynham, T.J., Dube, D.E.	1989	The Canadian forest fire danger rating system: an overview; The Forestry Chronicle	VOYA
	Forest fire danger rating research in Canada was initiated by the federal government in 1925. Five different fire danger rating systems have been developed since that time, each with increasing universal applicability across Canada. The approach has been to build on previous danger rating systems in an evolutionary fashion and to use field experiments and empirical analysis extensively. The current system, the Canadian Forest Fire Danger Rating System (CFFDRS), has been under development by Forestry Canada since 1968. The first major subsystem of the CFFDRS, the Canadian Forest Fire Weather Index (FWI) System, provides numerical ratings of relative fire potential based solely on weather observations. The second major subsystem, the Canadian Forest Fire Behavior Prediction (FBP) System, accounts for variability in fire behavior among fuel types (predicting rate of spread, fuel consumption, and frontal fire intensity). A third major CFFDRS subsystem, the Canadian Forest Fire Occurrence Prediction (FOP) System, is currently being formulated.			
226	Stocks, B.J., McRae, D.J., Lynham, T.J., Hartley, G.R.	1990	A photo-series for assessing fuels in natural forest stands in northern Ontario; Canada-Ontario Forest Resource Development Agreement	APIS, GRPO, ISRO, PIRO, VOYA
	This photo-series was designed to present photographs and a detailed inventory of fuels for important stands in the Boreal and Great Lakes and St. Lawrence Forest regions of Ontario. A database was compiled on natural fuel loads for 300 stands in a variety of fire-dependent ecosystems across northern Ontario. Fuels data such as that presented here will be useful in calibrating fire behavior and fire growth models. The photo-series and data will help fire managers to interpolate between specific fuel types found in the Canadian Forest Fire Behavior Prediction (FBP) System. The document can also be used as a training tool at the operational fire management level to demonstrate the variability within and between fuel types across the province.			
227	Stokes, M.A., Dieterich, J.H., technical coordinators	1980	Proceedings of the fire history workshop	VOYA
	The purpose of the workshop was to exchange information on sampling procedures, research methodologies, preparation and interpretation of specimen material, terminology, and the application and significance of findings, emphasizing the relationship of dendrochronology to fire history interpretations.			
228	Stottlemyer, Robert R., Cole, Kenneth L.	1986	Effects of fires on temperate forests: north central United States – a research proposal	VOYA
	A research proposal to study the specific effects of fire on various community types in the Great Lakes Region including study sites within Voyageurs National Park. The objectives of the study are to determine the origin and ecological history of the mature pre-settlement forests in the specific park units and relate their present status to the primeval situation (2) characterize regional change which has occurred since settlement, and assess the relative contributions to these changes resulting from climate, fire, insects and disease, changes in land use, large herbivores, and change in airborne contaminant levels (3) determine patterns of change which have occurred in specific national parks, and (4) Develop both short- and long-term strategies for maintaining or restoring natural forest ecosystems in these national parks.			

229	Stottlemyer, Robert R., Cole, Kenneth L.	1987	Effects of fires on temperate forests: north central United States FY1986 progress report and planned research for FY1987 (GLARSU Report #25)	ISRO
	Reports on the second year of a three year study. The study area for this project includes the National Park units of the upper mid-west, including Isle Royale National Park. The long-term goal of this study is to provide a scientific basis for future management programs aimed at maintaining, and restoring natural ecosystems, and to help management evaluate policy alternatives and their possible consequences for national park units of the Great Lakes Basin. The objects are to determine the origin and ecological history of the mature pre-settlement forests; characterize regional change which has occurred since settlement and assess the relative contributions to these changes resulting from climate, fire, insects, and disease, changes in land use, large herbivores, and change in airborne contaminant levels; determine patterns of change which have occurred in specific national parks; and develop short- and long-term strategies for maintaining or restoring natural forest ecosystems in these national parks.			
230	Stottlemyer, Robert, Rutkowski, Darcy, Toczydlowski, David	1993	Long-term study of boreal watershed/lake ecosystems, Isle Royale and Michigan's Upper Penninsula: 1992 progress report and 1993 work plan research report #55 submitted to Dr R Herrmann, Program Director, Watershed Research, NPS	ISRO
	This annual report presents information for FY92, and contains some detail as to what research will be done and/or planned during the next year. In FY92, the authors began analyzing the remeasurement data from the biomass plots at Wallace Lake to assess what gains or losses may have occurred. The comparison of Isle Royale biomass in boreal forests against that of a mature northern hardwood site in the Upper Peninsula have been published. Further, completion of the dataset on the blowdown transects first measured in 1989, giving four years of blowdown data. This report probes three main questions by presenting the problems, hypotheses, research reports and expected results. The questions are (1) Ecological Effects of snowpack and snowmelt on soil and surface water chemistry; (2) Effect of ecological factors on forest vegetation patterns in national parks of the Great Lakes basin; and (3) In the sensitive, southern boreal tension zone, increased atmospheric carbon dioxide alone will not increase ecosystem production; its relative effect will be enhanced by the present and predicted increases in levels of atmospheric N input.			
231	Swain, Albert M.	1973	A history of fire and vegetation in northeastern Minnesota as recorded in lake sediments; Quaternary Research	GRPO, ISRO, VOYA
	"The record of charcoal in lake sediments indicates that fire has always been an important ecological factor in the forest history of northeastern Minnesota. The annually laminated sediments of Lake of the Clouds permit precise dating of the charcoal peaks and record changes in the influx of various pollen types. A detailed record of the past 1000 yr shows that the average frequency of fire is approximately 60-70 yr, with a range of about 20-100 yr. The amount of charcoal in sediments dating between 1000-500 y.a. is consistently higher than that for the last 500myr, although the fire frequency for the two periods was not appreciably different. Pollen analysis shows no change or only short-term changes in the percentages of major pollen types following charcoal peaks." (Abstract by author)			
232	Swain, Albert M.	1981	Vegetation and fire history at Voyageurs National Park	VOYA
	Recent studies have been done describing the present forests and the history of logging and post-logging fires in Voyageurs National Park, but no detailed and well-dated paleoecological studies of forest vegetation and fire history of the past 1,000 to 2,000 years currently existed. Frozen crust sediment samples were obtained from the deepest points in Cruiser and Little Trout lakes for pollen and charcoal analysis. The pollen records show that white pine, red/jack pine, spruce, fir, birch, and aspen have dominated the upland forest vegetation during the past 1,000 years. Effects on forest composition resulting from logging and fires following logging were variable within the park. The results of charcoal analysis and the changes shown in aspen pollen suggest that periodic fires have been important in maintaining the mosaic of forest vegetation during the past 1,000 years. Estimates of fir frequency range from 70 to 200 years between burns. Increased percentages of spruce and fir pollen suggest a cooler climate between 550 and 100 years ago.			
233	Taylor, Robert S.	1989	Reconstruction of fire histories of black oak savannas by analysis of stand structure of multiple-stem trees	INDU
	Tree cores were collected from the multiple-stem trees in six different stands of black oak savanna at the Indiana Dunes National Lakeshore. Tree stand structures revealed information about fire histories of the sites. Figures indicate birthdates of multiple-stem trees from each site and fire intervals. Topographic maps indicate site locations, and the appendix provides computer file names for the data and figures.			

234	Taylor, Robert S.	1990	Reconstruction of twentieth century fire histories in black oak savannas of the Indiana Dunes National Lakeshore	INDU
	The study examines the factors in the disturbance history of oak savannas in the Indiana Dunes National Lakeshore that led to their development. The introduction provides descriptions of oak woodlands in the midwestern United States, the park, fire ecology research in midwestern oak woodlands, fire in the park, management problems at the National Lakeshore, methods of studying fire history, and study questions. A description of core and fire scar analysis and collection follows. Results of the study are demonstrated through answers to the study questions posed in the introduction. Management implications and recommendations are also included.			
235	Todd, B., Kourtz, P.H.	1991	Predicting daily occurrence of people-caused forest fires	VOYA
	People are responsible for starting two out of every three forest fires in Canada. To efficiently suppress these fires while they are still small, a modern forest fire control organization must be able to predict their numbers and locations one day in advance. The procedure presented here represents the current state of one of the paths taken in the search for a more accurate prediction system.			
236	Tolley, Ivan R.	1975	"Fire management section" of the Isle Royale National Park natural resources management plan	ISRO
	Delineates fire management policy in 1975. Includes environmental assessment.			
237	U.S. Department of Interior, Fish And Wildlife Service	no date	Environmental assessment and prescribed burning plan, Seney National Wildlife Refuge	PIRO
	The Seney Fire Management Plan for the Seney National Wildlife Refuge, MI includes an environmental assessment, an environmental description, a wildfire suppression policy, and a prescribed burning plan. The environmental assessment addresses adverse impacts of wildfire [air pollution, water pollution, soil erosion, visual impacts, effects on wildlife, escape of prescribed fire, organic soils, and energy resources used in setting prescribed fires and backfires]. Beneficial impacts are discussed and include improved habitat for wildlife, fire fuel reduction, reforestation and timber stand improvement. Alternatives are mentioned. The environmental description gives information about the post-glacial history of the topography, a description of the wetlands and sandy knolls, and a brief human history. Wildfire suppression policy and the prescribed burning plan objectives are defined. The latter includes clearing woody vegetation from the edges of pools, managing appropriate ratios of woodland and grassland to provide habitat for sharp-tailed grouse, reducing the hazard of wildfire, preparing seedbed for jack pine and reducing ground litter in pine forests.			
238	U.S. Forest Service	2000	Fire family plus user's guide	VOYA
	Title self-explanatory			
239	U.S. Forest Service, Fire and Aviation Mgt	1993	Fire related considerations and strategies in support of ecosystem management	VOYA
	Ecosystem management is a new policy initiative that more fully integrates ecological principles and processes into Forest Service activities. Applying this new policy to Fire Management will present fundamentally important challenges and opportunities. This paper directs attention to short-interval fire-adapted ecosystems because they are often the first indicator of a potentially larger problem.			
240	U.S. Geological Survey	1936	Progress of 1936 forest fire	ISRO
	Two large 1931 U. S. Geological Survey maps which show the progress of the 1936 forest fire from early to late August, 1936.			
241	U.S. Geological Survey	no date	Local operational area hazard map	INDU
	This map indicates hazard areas for the fire management local operation area (Indiana Dunes National Lakeshore). Indicated on the map are powerlines, towers, aerial activities, military routes, airports, heliports, restricted areas, areas of known extreme turbulence, and industrial areas.			
242	Van Wagner, C.E.	1978	Age-class distribution and the forest fire cycle; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, SACN, VOYA
	The expected age-class structure of a forest dependent on periodic fire for disturbance and renewal is described and presented. It is simply the negative exponential distribution, well know in probability mathematics. An important feature of this concept is that the present age-class structure of such a forest is the key to its past fire history. Its limitations are discussed, and the computer simulation of the variations, including the interaction of fire and logging, is described. Three examples of its use in interpreting fire history are given.			

243	Vaughen, Marian R., Vaughen, Margery M.; author unknown	1981	No title	PIRO
	Correspondence letter addresses legalities of management decisions made by the National Park Service concerning houses and building rights in the Inland Buffer Zone of Pictured Rocks National Lakeshore, MI. References are made to legislation that created the lakeshore (Public Law 899-668) and to the General Management Plan. Logging, fire, and commercial campgrounds are also addressed.			
244	Voyageurs National Park	no date	Alex Gerber interview regarding forest fires in 1936	VOYA
	Portions of an interview conducted with Alex Gerber regarding large forest fires that engulfed the Kabetogama Pennisula in 1936.			
245	Voyageurs National Park	no date	Blind Ash Bay prescribed burn unit data	VOYA
	This is a collection of various information concerning the Blind Ash Bay Prescribed Burn Unit in Voyageurs National Park. Included in this file are the following: 1992 Fire weather chronology reports, Blind Ash Bay Fire Behavior notes (handwritten), energy release and spread component data graphs, burn activity costs (personnel, travel vouchers, meals, lodging etc.), official documentations (individual fire reports, escaped fire situation analysis) and maps of the area.			
246	Voyageurs National Park	no date	Fire management units, Voyageurs National Park	VOYA
	Park map with areas proposed for prescribed burning from 1989 through 1995. Differentiates three types of fire management units: prescribed natural fire units, conditional fire units, and fire suppression units.			
247	Voyageurs National Park	no date	Fire history - Voyageurs National Park	VOYA
	Two GIS generated park maps with natural wildfires delineated. One map shows fires in 1923, the other from 1936.			
248	Voyageurs National Park	no date	Longshot prescribed natural fire data	VOYA
	Collection of data sheets and notes on the Longshot prescribed natural fire in Voyageurs National Park which began on August 3, 1990 and was declared out on October 1, 1990. Includes maps of the burn area, associated news releases, NPS-PNF Decision Record sheets, fire activity updates, weather updates, and prescribed natural fire data sheets which provide information on fire location, weather conditions, fuel moisture and fire behavior.			
249	Voyageurs National Park	no date	Measurement of duff fuel loading for three vegetation types in Voyageurs National Park, Minnesota	VOYA
	This report documents the method for determining duff fuel loading for three vegetation types (upland black spruce, jack pine, and boreal mixed-wood) in Voyageurs National Park and is based on Canadian research.			
250	Voyageurs National Park	1987	Wildland fire monitoring guide, Voyageurs National Park, Minnesota	VOYA
	"The objective of fire monitoring is to gather the data necessary to evaluate the effects of fire in different fuel types and thus enhance the fire manager's ability to predict and interpret fire behavior. A well-developed fire monitoring program provides a defensible base for management actions and justification of goal and strategy modification. It also provides the necessary data for prescription development." (From author's intro) This manual provides detailed instructions on proper set up and monitoring of sites for forest fuel, fire behavior and fire weather. It also provides information on the park's fire management action plan and the responsibilities assigned to each division.			
251	Voyageurs National Park	1987	Wildland fire management plan - environmental assessment	VOYA
	This wildland fire management plan is an appendix of Voyageurs National Park's Natural Resources Management Plan and Environmental Assessment and implements the approved course of action presented in the fire management project statement. It is a detailed program for action and the primary guide for all wildland fire management actions within the Park. The NPS proposes to allow lightning caused fires to burn within designated areas in Voyageurs National Park when they can be contained within park boundaries, except when this would endanger visitor safety, private or leased lands or structures. Prescribed burning would be used to create and maintain a mosaic of burned and unburned areas that will approximate natural conditions in areas where the risk of fire escape beyond park boundaries in the spring, summer, and fall is high. All unplanned human-caused fires in the park would continue to be routinely suppressed.			

252	Voyageurs National Park	1988	Fire situation analyses (FSAs) for Bearslide Creek fire	VOYA
	Series of three Fire Situation Analysis (FSA) reports for the Bearcreek Slide prescribed natural fire. Each report represents one day of the fire. Reports each include information on the following: fire size, location, vegetation type, fuel model type, area map, intensity, rate of spread, direction of spread, and possible threats to life, property or resources. Appendices include weather conditions and moisture sticks. Also included with these reports are fire behavior worksheets.			
253	Voyageurs National Park	1988	Individual fire report - Bearslide Creek fire, Voyageurs National Park	VOYA
	Report detailing the progression of a natural fire that was allowed to burn under the newly adopted prescribed natural fire management plan.			
254	Voyageurs National Park	1989	Prescribed burn plan for Cutover Island	VOYA
	Cutover Island Prescribed Burn Unit is located on the northcentral side of Kabetogama Lake, in primarily aspen-birch and upland pine forest types. The primary purpose of the burn is hazard fuel reduction and restoration of natural processes. The plan includes the following 1)introduction, 2)Burn Unit Description 3)Purpose of Burn, 4) Prescribed Fire Complexity 5)Burn Organization 6) Costs 7)Scheduling 8)Preburn Considerations 9) Burning Prescriptions 10)Firing Techniques. Ignition Methods, and Test Fires, 11) Smoke Considerations 12)Holding Plan 13) Contingency Plan for Fire Escape, 14) Escaped Fire Designated Incident Commander 15) Communications, Coordination, and Burn Day Notification, 16) Monitoring, Weather, and Evaluation Procedures 17) Other Considerations, 18) Coordination and Public Involvement 19) Actual Burn Costs 20) Go/No-Go Checklist, 21) SASEM Calculations, 22) Persons Contacted and 23) Fire Behavior Calculations.			
255	Voyageurs National Park	1989	Prescribed burn plan for the Mukooda Lake burn unit	VOYA
	The Mukooda Lake Burn Unit is located on the southwest side of Sand Point Lake. The primary purpose of the burn is to reduce hazard fuel loading and restore natural processes. The plan includes the following 1) Introduction, 2) Burn Unit Description 3) Purpose of Burn, 4) Prescribed Fire Complexity 5) Burn Organization 6) Costs 7) Scheduling 8) Preburn Considerations 9) Burning Prescriptions 10) Firing Techniques, Ignition Methods, and Test Fires, 11) Smoke Considerations 12) Holding Plan 13) Contingency Plan for Fire Escape, 14) Escaped Fire Designated Incident Commander 15) Communications, Coordination, and Burn Day Notification, 16) Monitoring, Weather, and Evaluation Procedures 17) Other Considerations, 18) Coordination and Public Involvement 19) Actual Burn Costs 20) Go/No-Go Checklist, 21) SASEM Calculations, 22) Persons Contacted and 23) Fire Behavior Calculations.			
256	Voyageurs National Park	1989	Individual fire report - Cutover Island, burn #1	VOYA
	Official documentation of fire activities related to the Cutover Island Burn #1. This report includes maps of the burn area, and a remarks section which provides information on the resources used, the prescribed burn chronology, and on-site weather data.			
257	Voyageurs National Park	1989	Individual fire report for Cutover Island burn #2	VOYA
	Official documentation of fire activities related to the Cutover Island Prescribed Burn #2. This report includes maps of the burn area, and a remarks section that provides information on the resources used, the prescribed burn chronology, and on-site weather data.			
258	Voyageurs National Park	1989	Wildland fire management plan, 1989	VOYA
	This wildland fire management plan is an appendix of Voyageurs National Park's Natural Resources Management Plan and Environmental Assessment and implements the approved course of action presented in the fire management project statement. It is a detailed program for action and the primary guide for all wildland fire management actions within the Park. Note: This is the current edition of this plan.			
259	Voyageurs National Park	1989	Cutover Island prescribed burn	VOYA
	File containing miscellaneous documents and data forms pertaining to the Cutover Island Prescribed Burn Unit.			
260	Voyageurs National Park	1990	Individual fire report, Mukooda Lake - Subunit 3	VOYA
	Official documentation of fire activities related to the Mukooda Lake (Subunit 3) Prescribed Burn. This report includes maps of the burn area, and a remarks section that addresses the resources used, the prescribed burn chronology, and on-site weather data sheets.			
261	Voyageurs National Park	1990	Individual fire report - Mukooda Lake subunit 4	VOYA
	Official documentation of burn activities conducted in the Mukooda Lake Subunit 4 prescribed burn. Report includes map of burn area, resources used, prescribed burn chronology, and on-site weather data sheets.			

262	Voyageurs National Park	1990	Longshot prescribed natural fire review	VOYA
	This is actually a report in the form of a memorandum to Voyageurs National Park Superintendent. It summarizes the events surrounding the Longshot Prescribed Natural Fire which began on August 3, 1990, and provides copies of the Forest Index Plot Fuels Inventory Data Sheets, the Downed Woody Material Computation Summary, the Individual Fire Report, and a detailed chronology of events.			
263	Voyageurs National Park	1991	NRPP progress summary report	VOYA
	Report summarizes how monies provided through the Natural Resources Preservation Program (NRPP) were used to implement various aspects of ongoing projects in Voyageurs National Park. Primarily discusses progress made in implementing the Wildland Fire Management Program, and purple loosestrife mitigation. Also includes project statement sheets for exotic fish invasion/introductions research, and aquatic ecosystem contaminants research.			
264	Voyageurs National Park	1991	Mukooda prescribed burn unit	VOYA
	Collection of documents and data forms pertaining to Subunits 1 and 2 of the Mukooda Prescribed Burn Unit. File includes prescription fire record data sheets, weather updates, and cost-related documents such as DI-1s and meal tickets.			
265	Voyageurs National Park	1992	Blind Ash Bay prescribed burn completion report, Voyageurs National Park	VOYA
	This report is a detailed chronology of prescribed burn activities in the Blind Ash Bay Prescribed Burn Unit. It includes weather forecasts & updates, personnel and equipment deployments and activities, fire indices, test burn results, and fire behavior/activity once ignited. The burn was begun on 5/27 and completed on 5/30/92 with a total of 325 acres burned at a cost of $89.95 per acre.			
266	Voyageurs National Park	1993	Moose Bay prescribed burn completion report, Voyageurs National Park	VOYA
	The 324 acre Moose Bay prescribed burn unit is located at the west end of Namakan Lake surrounded by Moose Bay on the west and Hoist Bay on the East. The unit consists of 62 year old jack pine with pockets of red/white pine and aspen/birch. The timber in this area has its origin from late 1920's logging and subsequent wildfires which established the predominate jack pine. The primary purpose of this underburning was for hazard fuel reduction. The secondary purpose was to replicate a natural low intensity surface fire in jack pine. This report provides a detailed prescribed burn chronology, discussions of the fire behavior, measured fire effects, maps of the burn area, weather data, and burn costs.			
267	Voyageurs National Park	1993	Preliminary results of underburning for fire hazard reduction in the southern boreal transition forest of Voyageurs National Park, Minnesota; Symposium on fire in wilderness and park	VOYA
	In 1989, Voyageurs National Park's Wildland Fire Management Plan became the first National Park Service fire management plan to be reinstated for implementation after the moratorium following the 1988 Yellowstone Fires. This Wildland Fire Management Plan divides the park into three fire management units. The Fire Suppression Unit provides for intensive protection of human life and property within the Park's developed zones. This unit also allows the use of mechanized equipment and management-ignited prescribed burns to reduce the amount of hazardous fuels. The Prescribed Natural Fire Unit is designed to allow lightening-caused fires to burn within a predetermined prescription. The Conditional Fire Unit balances the protection of life and property within and beyond the park boundary and restoring and perpetuating fire-dependent communities through the use of management--ignited prescribed burns and prescribed natural fires. Since 1989, approximately 1,000 acres within the Park have been treated with management-ignited prescribed burns and prescribed natural fires for hazard fuel reduction.			
268	Voyageurs National Park	1995	Prescribed burn plan for the Daley Bay burn unit	VOYA
	The Daley Bay Prescribed Burn Unit is an understory burn in jack pine-mixed conifers for the primary purpose of hazard fuel reduction and a secondary purpose of replicating natural low-intensity fire in this jack-pine ecosystem. The burn unit is located in the south-central portion of the park near Daley Bay on Kabetogama Lake. The unit will be ignited by hand using drip torches. The plan includes the following 1) Introduction, 2) Burn Unit Description 3) Purpose of Burn, 4) Prescribed Fire Complexity 5) Burn Organization 6) Costs 7) Scheduling 8) Preburn Considerations 9) Burning Prescriptions 10) Firing Techniques, Ignition Methods, and Test Fires, 11) Smoke Considerations 12) Holding Plan 13) Contingency Plan for Fire Escape, 14) Escaped Fire Designated Incident Commander 15) Communications, Coordination, and Burn Day Notification, 16) Monitoring, Weather, and Evaluation Procedures 17) Other Considerations, 18) Coordination and Public Involvement 19) Actual Burn Costs 20) Go/No-Go Checklist and 21) SASEM Calculations.			

269	Voyageurs National Park	1995	Fire occurrence and return interval at Voyageurs National Park, Minnesota	VOYA
	Report presenting the fire history of Voyageurs National Park. Includes sections on historical fire occurrence, pre-settlement and current park vegetation types, natural fire return intervals, past fire suppression impacts and current practices.			
270	Voyageurs National Park	1995	Hazard fuel reduction (prescribed burn) for Kettle Falls area	VOYA
	Collection of documents related to the prescribed burn unit at Kettle Falls Hotel area. Included in this collection is the project clearance form, a narrative describing the present conditions in this area and the reasons for proposing a prescribed burn, data sheets depicting present fuels around the buildings, photos documenting the blowdown fuel loading conditions of each transect, "Forest Plot Fuels Inventory Data Sheets", and "Downed Woody Materials Computation Summary" sheets for each transect.			
271	Voyageurs National Park	1996	Management ignited prescribed fire use in Voyageurs National Park	VOYA
	Voyageurs National Park has used management ignited prescribed burns in pine stands since 1989 for the purpose of hazard fuel reduction and replicating low intensity surface fires. Monitoring of fire effects within these burns has documented short-and long-term impacts on vegetation and fuel loading. Observations are presented from two fire effects monitoring plots representative of mixed red and white pine stands which have been followed for five years post-burn. Regeneration of white pine has increased dramatically after understory burning of these pine stands.			
272	Voyageurs National Park	1996	Weather and fire behavior in Voyageurs National Park, May 1996	VOYA
	Record setting temperatures and snowfall during the 95/96 winter at VOYA contributed to record late ice-out dates and a late spring. Phenologically, leafout of vegetation was set back 7-10 days. Normally, drainage burning (grass fuel types) is accomplished in early to mid-April. This year, due to residual snow in the drainages and high water table, this burning was not attempted until late May. This report briefly describes the weather data and burning activities that took place in May of 1996 in Voyageurs National Park.			
273	Voyageurs National Park	2001	Developing landscape strategies: applying tools to selected vegetation communities workshop summary	VOYA
	In September 2001, Voyageurs National Park conducted a vegetation management workshop to help refine the desired future condition for the vegetation of the park, to identify research needs, and to develop a technique for evaluating vegetation communities in the park. This is the Summary Report for that workshop and includes issues, recommendations, succession, alternatives, and research needs for each of the six vegetation community groups addressed during the workshop. The vegetation community groups are: northern hardwood shrub swamps, spruce-fir-aspen forest, aspen-birch/boreal conifer forest, red and white pine forest, jack pine/balsam fir forest, and treed rock barrens.			
274	Voyageurs National Park	2002	Environmental assessment for the fire management plan for Voyageurs National Park	VOYA
	Title self-explanatory			
275	Voyageurs National Park	2002	Fire management plan for Voyageurs National Park	VOYA
	Title self-explanatory			
276	Wein, R.W., MacLean, D.A., editors	1983	The role of fire in northern circumpolar ecosystems	VOYA
	Fire in the forest came to be viewed in a new perspective during the decades of the 1960s and 1970s. Instead of being regarded as an unmitigated threat to be suppressed whenever practicable, it was seen increasingly as an integral part of ecological processes. Accordingly, it claimed attention as a tool of environmental management and as an object of new research. This volume, focused on the great belt of tundra and northern and central boreal forests encircling the northern hemisphere, examines these ecosystems in a pioneering fashion.			
277	Western Region Prescribed and Natural Fire Monitoring Task Force	1992	Western region fire monitoring handbook 1992	VOYA
	This Handbook is intended to facilitate and standardize monitoring for the Western Region. Levels of monitoring activity, related to fire management goals and strategies, are established and defined. .... Information useful in carrying out sampling and reporting procedures are provided in the appendices.			

278	William, J.T., Rothermel, R.C.	1992	Fire dynamics in northern Rocky Mountain stand types	VOYA
	In the Northern Rocky Mountains, fire growth and potential fire severity develop differently according to the type of vegetation. Grass, brush, and timber-dominated types respond to fire based on their unique physical characteristics and the sites they occupy. The fire dynamics of these three types are described, using examples, and their management implications are discussed.			
279	Wright, Richard F.	1976	The impact of forest fire on the nutrient influxes to small lakes in northeastern Minnesota; Ecology	VOYA
	The Little Sioux Fire of May, 1971 burned most of the mixed coniferous-deciduous forest on the watersheds of Meander and Lamb lakes in northeastern Minnesota. During 1972, hydrologic and chemical budgets were determined for the terrestrial watersheds of these lakes and for the lakes themselves. Nutrient fluxes were also evaluated. Data was collected to study the effects the fire had on these areas. Results showed there was little minimal nutrient losses perhaps due to the fact that the fire occurred in Spring and consequentially revegetation began almost immediately.			
280	Yaussy, D.A., Compiler	2000	Proceedings: workshop on fire, people, and the central hardwoods landscape	INDU
	Contains 18 papers and 16 poster abstracts on the history of fire, fire ecology, fire and ecosystem management, and fire and the future presented at the workshop on fire, people, and the central hardwoods landscape.			
281	Zimmerman, G.T., Burnell, D.L.; Cole, D.N., McCool, S.F., Borrie, W.T., O'Loughlin, J., compilers	2000	The federal wildland fire policy: opportunities for wilderness fire management; Wilderness ecosystems, threats, and management (Vol. 5); Wilderness science in a time of change	APIS, ISRO, SLBE, VOYA
	The Federal Wildland Fire Management Policy and Program Review represents the latest stage in the evolution of wildland fire management. This policy directs changes that consolidate past fire management practices into a single direction to achieve multidimensional objectives and creates increased opportunities for wilderness fire management. Objectives previously achieved through prescribed natural fire are now achieved through application of an appropriate management response to wildland fires. The 1998 fire season provided both a test of the policy and a clear indication of future wildland fire management and benefits to wilderness management.			

FOREST

1	Agee, James K.; Cole, D.N., McCool, S.F., Borrie, W.T., O'Loughlin, J., compilers	2000	Wilderness fire science: a state of the knowledge review; Wilderness ecosystems, threats, and management (Vol. 5); Wilderness science in a time of change	APIS, ISRO, SLBE, VOYA
	Wilderness fire science has progressed since the last major review of the topic, but it was significantly affected by the large fire events of 1988. Strides have been made in both fire science and fire effects, and in the issues of scaling, yet much of the progress has not been specifically tied to wilderness areas or funding. Major challenges include better understanding of the regional context and function of wilderness areas, as well as understanding and incorporating fire patchiness, variability and synergistic disturbance factors into predictive models. If more precise models are to be applied accurately in wilderness, better weather databases are essential.			
2	Ahlgren, Clifford E.	1960	Some effects of fire on reproduction and growth of vegetation in northeastern Minnesota; Ecology	GRPO, ISRO, VOYA
	Fire as an important factor in determining the course of plant succession has been investigated by a number of workers. In the coniferous forests of the Lakes States, however, insufficient emphasis has been placed on the detailed study of fire as an ecological factor. This paper is an interim report on a long-range study of the effects of wild and prescribed fires in northeastern Minnesota.			
3	Ahlgren, C.E.; Kozlowski, T.T., Editors	1974	Effects of fires on temperate forests: north central United States; fire and ecosystems; physiological ecology	APIS, GRPO, INDU, ISRO, LIBO, MISS, PIRO, SACN, SLBE, VOYA
	As a dramatic agent of change, wildfire has played a major role in shaping the vegetation of north central United States and adjacent central Canada for many centuries. Paper includes discussions of physical factors in ecological change, fire adaptation in pine species, post-fire development of other plant species, and interrelationships between vegetation height, percent cover, and number of species.			
4	Allen, Arthur W., Terrell, James W., Mangus, Warren L., Lindquist, Edward L.	1991	Application and partial validation of a habitat model for moose in the Lake Superior region; Alces	VOYA
	A modified version of the dormant-season portion of a Habitat Suitability Index (HSI) model developed for assessing moosehabitat in the Lake Superior region was incorporated in a Geographic Information System (GIS) for 490 km2 of Minnesota's Superior National Forest. Moose locations (n=235) were plotted during aerial surveys. Dormant-season forage and cover quality for 1000m, 500m, and 200m radii plots around random points and moose locations were compared using U.S. Forest Service stand examination data. Cover quality indices were lower than forage quality indices within all plots. The median value for the average quality index was greater (P=0.003) within 200m plots around cow moose locations than for plots around random points for the most severe winter of the study. The proportion of highest-quality winter cover was greater within 500m and 200m plots around cow moose than within similar plots around random points during the two most severe winters. These results indicate that suboptimum ratings of winter habitat quality used in the GIS for dormant-season forage >100m from cover, as suggested in the original HSI model, are reasonable.			
5	Apostle Islands National Lakeshore	1978	Apostle Islands' tree diameters listed in general land office survey, 1852-1857	APIS
	Tables of tree diameters by species and islands obtained from the General Land Office Survey notes 1852-1857.			
6	author unknown	no date	Plant communities of the State Point area	VOYA
	A map of the State Point area, Voyageurs NP, depicts the plant communities and locations of stands sampled. The total vegetation-site complex is subdivided into six site units using moisture and nutrient intensities as criteria. These units, which are relatively homogeneous ecologically, can be expected to respond similarly to disturbance, have common climax vegetation, and be similar in productivity. Stands sampled in each site unit are grouped into plant communities and named according to dominant species. Existing plant communities are described by their condition, structure, age, and species composition. Locations of some rare and/or endangered species are depicted. Brief statements about community-site relationships are made and natural successional trends discussed.			
7	author unknown	1978	Preliminary forest type map, Pictured Rocks National Lakeshore	PIRO
	This preliminary map is a forest type map based largely on aerial photographs and satellite imagery.			
8	author unknown	1979	Prime forestlands identification project: Upper Peninsula of Michigan	PIRO
	The report lists the soil types found throughout Alger County and describes their ability to support forests.			

9	author unknown	1986	Aerial photograph of Sand Point and the Thumb and Tombolo of Grand Island	PIRO
	A color, aerial photograph of the Thumb and Tombolo of Grand Island National Recreation Area (U.S. Forest Service), Sand Point, and a portion of Pictured Rocks National Lakeshore, MI to the east and the west of Sand Point was taken on June 8, 1986. A 29 inch square enlargement is framed and hangs in the outer office of the Resource Management Specialist at Pictured Rocks National Lakeshore. The photograph is labeled with the date and the following: NOS and EC No. 6740. The scale is not provided. The shallower water depths and the beach ridges of the Tombolo of Grand Island are clearly visible. It is of historical interest because erosion by Lake Superior in the 1990's has changed the nature of the shoreline at Sand Point.			
10	Baggett, Leslie F.	no date	Individual tree canopy effects on vegetation in northern Indiana savannas	INDU
	Three Indiana savannas were studied for tree canopy effects on understory vegetation, microclimate characteristics and plant species composition as compared along transects, extending from the base of black oaks (*Quercus velutina*) into adjacent gaps. Determinations were made regarding differences in species composition, frequency, and cover along transects from tree to gap, whether environmental changes such as litter cover and depth, canopy cover, soil horizon depths, rainfall, or light intensity occurred from the base of a tree into the adjacent gap, and how the plots relate in community analysis of both environmental and vegetative factors. Sites chosen for study include Inland Marsh and Miller Woods at the Indiana Dunes National Lakeshore, and Jasper-Pulaski State Fish and Wildlife Area. Various graphs represent data for the study, and a species list for the study is included.			
11	Barney, R.J., Stocks, B.J.; Wein, R.W., MacLean, D.A.	1983	Fire frequencies during the suppression period; the role of fire in northern circumpolar ecosystems; SCOPE 18	APIS, GRPO, ISRO, PIRO, VOYA
	Wildfires have been and currently are an important factor in the northern ecosystems of all circumpolar countries. Historical accounts of fires are general and often provide few quantitative data; therefore, we more recent data from the fire suppression period to draw conclusions about fire frequencies. In this chapter, data on the frequency of wildfires in northern Canada, Alaska, USSR, Sweden, and Finland are reviewed, and problems with the interpretation of fire frequency data are discussed. From the limited data which are available it appears that the patterns of fires at the northern latitudes are very similar to those observed in Alaska and Canada.			
12	Beals, Edward	1958	The phytosociology of the Apostle Islands and the influence of deer on the vegetation	APIS
	Sixty-six stands of forest vegetation on the Apostle Islands were studied. The stands were sampled for tree, sapling, and available browse data, by the point-centered quarter method; and for herb and shrub frequency by the one-meter quadrat method. Damage to the browse by deer was also recorded.			
13	Beals, Edward W., Cottam, Grant	1960	The forest vegetation of the Apostle Islands; Ecology	APIS
	During the summer of 1966, 22 stands of forest vegetation originally sampled in 1956 and 1957 on 6 of the Apostle Islands in Lake Superior were re-sampled for species composition, density, and deer browsing, using the same methods of the original study. Those stands which have been under the influence of a large deer herd for a long time seem to have attained a sort of equilibrium, much changed from their pre-deer condition, but changing very slowly now. Those stands more recently subjected to over-browsing are still undergoing active change. Recovery from a deer irruption appears to take many decades, and apparently yew, the preferred browse species, is a very conservative species that declines rapidly when heavily browsed and recovers slowly after browsing is stopped. On most of the islands, deer have not been present long enough to have a major impact on the tree stratum, but as old trees die, they will be replaced with browse-tolerant species. Whether these species will ever make a good forest is problematical due to the effects of deer browsing on their early growth stages.			
14	Benchley, E. D., Copes, F. A., Kolb, M. F., Lasca, N. P., Porubcan, P. J., Schabel, M. J., Whitman, L. G.	1993	Investigation of the influence of late 19th - early 20th century logging on fluvial geomorphology and fisheries habitat on the Indian River, Hiawatha National Forest, Michigan	PIRO
	Citation only from Sjogren, 1996, thesis.			
15	Benzie Soil Conservation District	1982	Forest soils report - Benzie County	SLBE
	Describes the soils of Benzie County, Michigan with respect to prime forestlands. Defines prime forestlands, soil description terminology, and forestland potential terminology. Discusses prime forestlands and soil groupings in Benzie County. Each soil grouping in Benzie County is rated based on general soil characteristics (depth, drainage, slope, texture, geologic feature, inclusions, and erosion hazard) and forestland potential (major tree species, productivity, reforestation potential, and other features).			

16	Bergeron, Yves	1991	The influence of island and mainland lakeshore landscapes on boreal forest fire regimes; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	In order to characterize the fire regime of the southern boreal forest and to understand the way in which landscape and fire regime interact, a detailed study of fire history was undertaken in two adjacent contrasting landscapes in northern Quibec. The fire history for the islands of Lake Duparquet was reconstructed and compared to that of the surrounding lakeshore. We suggest that the fire regime in the boreal forest is controlled by long-term climate change at the regional scale, and by a strong interaction with landscape at the local scale, both components having a great impact on the distribution and the dynamics of boreal vegetation.			
17	Bergeron, Yves, Brisson, Jacques	1990	Fire regime in red pine stands at the northern limit of the species' range; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	In order to define more precisely the fire regime prevailing in red pine stands, and to evaluate its effect on the maintenance of marginal populations in the boreal forest, we documented the frequency, extent, and intensity of fires that affected red pine populations in northwest Quebec. We focused on two populations in Lake Duparquet, divided the islands into 5 X 5 m plots, and recorded topography, soil moisture, and vegetation for each plot. We mapped stems and noted fire scars, took core samples and stem cross-sections to determine the age of trees, and used fire scars, post-fire regeneration, surviving trees, and changes in growth rates as indicators of fire passage and intensity. Fire frequency was also estimated using fire history data from 13 other stands. The fire regime described for these insular stands at the limit of the species range is similar to that described for other parts of the range of red pine. We hypothesized that red pine is restricted to insular habitats at this northern limit of its range because of the particular fire regime that prevails there; the larger and more intense fire of the mainland here led to the elimination of the species.			
18	Bergeron, Y., Gauthier, S., Kafka, V., Lefort, P., Lesieur, D.	2001	Natural fire frequency for the eastern Canadian boreal forest: consequences for sustainable forestry; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, VOYA
	Given that fire is the most important disturbance of the boreal forest, climatically induced changes in fire frequency can have important consequences on the resulting forest mosaic age-class distribution and composition. Using archives and dendroecological data we reconstructed the fire frequency in four large sectors along a transect from eastern Ontario to central Quebec. Results showed a dramatic decrease in fire frequency that began in the mid-19th century and has been accentuated during the 20th century. The global warming that has been occurring since the end of the Little Ice Age (~1850) may have created a climate less prone to large forest fires in the eastern boreal forest of North America. A longer fire cycle has important consequences for sustainable forest management of the boreal forest of eastern Canada.			
19	Black, Christopher Douglas	1997	Habitat characteristics of the eastern timber wolf in the north central Upper Peninsula of Michigan	PIRO
	no abstract			
20	Bliss, John C., Bonnicksen, Thomas M., Mace, Thomas H.	1980	Computer-aided classification of forest cover types from small scale aerial photography; Environmental Management	APIS
	The National Park Service must map forest cover types over extensive areas in order to fulfill its goal of maintaining or reconstructing presettlement vegetation within national parks and monuments. Furthermore, such cover type maps must be updated on a regular basis to document vegetation changes. Computer-aided classification of small scale aerial photography is a promising technique for generating forest cover type maps efficiently and inexpensively. In this study, seven cover types were classified with an overall accuracy of 62 percent from a reproduction of a 1:120,000 color infrared transparency of a conifer-hardwood forest. The results were encouraging, given the degraded quality of the photography and the fact that features were not centered, as well as the lack of information on lens vignetting characteristics to make corrections. Suggestions are made for resolving these problems in future research and applications. In addition, it is hypothesized that the overall accuracy is artificially low because the computer-aided classification more accurately portrayed the intermixing of cover types than the hand-drawn maps to which it was compared.			

21	Bowerman, William W., IV	1991	Factors influencing breeding success of bald eagles in Upper Michigan	ISRO, PIRO
	Breeding success of bald eagles was studied at 7 nest sites on the Hiawatha National Forest, MI, 2 nest sites on the Ottawa National Forest, MI, and 1 site on the Seney National Wildlife Refuge, MI from May 20 to mid to late July (fledging), 1986. Observations of adult eagle behavior was done with binoculars and spotting telescopes. Breast feathers and blood from chicks raised in nests within 8 km of the Great Lakes were analyzed for levels of organochlorines (DDE, PCB) and mercury. These levels were compared with those from samples taken from chicks raised in nests further inland. Eight hundred specimens of bones, scales, feathers, fur, and other prey remains from nests and below nests were collected to identify prey species and their frequency of consumption. Three fish--northern pike, bullheads, and white suckers--are identified as dominant prey items in the diet of bald eagles. Breeding success near treated lakes was compared to that of untreated lakes. Breeding success in areas where there were differing number of yrs of treatment for rough fish removal was compared. These data were compared using analysis of variance (ANOVA with SAS/STAT).			
22	Bradley, A.F., Fischer, W.C., Noste, N.V.	1992	Fire ecology of the forest habitat types of eastern Idaho and western Wyoming	VOYA
	Provides information on fire as an ecological factor in the forest habitat types occurring in eastern Idaho and western Wyoming. Identifies Fire Groups based on fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.			
23	Bradley, A.F., Noste, N.V., Fischer, W.C.	1992	Fire ecology of forests and Woodlands in Utah	VOYA
	Provides information on fire as an ecological factor in forest habitat types, and in pinyon-juniper woodland and oak-maple brushland communities occurring in Utah. Identifies Fire Groups based in fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.			
24	Brandner, Thomas A., Peterson, Rolf O., Risenhoover, Kenneth L.	1990	Balsam fir on Isle Royale: effects of moose herbivory and population density; Ecology	ISRO
	Balsam fir population parameters were analyzed in Isle Royale to assess moose herbivory in relation to the population density of both fir and moose. In general, moose suppression of fir height growth and recruitment to the canopy increased with increasing moose density and increasing fir density. Where fir densities were low, sapling heights were restricted regardless of moose density. In such sites, sapling growth suppression has been continuous since a peak in the moose population in the late 1920s. Canopy fir trees at most sites established prior to arrival of moose on ISRO around 1910. At high fir density release from growth inhibition was common following a period of low moose numbers from the mid-1970s to early 1980s. Here this release should facilitate recruitment of fir and effect replacement of canopy losses due to senescence. In other areas, however, continuing canopy losses and lack of recruitment due to intensive herbivory by moose will greatly reduce the fir component of the canopy, effectively preventing any return to the fir-dominated forests of the past.			
25	Bryant, John P., Chapin, F. S. III	1985	Browsing-woody plant interactions during boreal forest plant succession; IN: K Van Cleve, F S Chapin, III, P W Flanagan, L A Viereck, and C T Dyrness, Editors Forest ecosystems in the Alaskan tiaga	ISRO
	no abstract			
26	Busing, R., Rimar, K., Stolte, K.W., Stohlgren, T.J., Waddell, K.	2000	Forest health monitoring vegetation pilot field methods guide; forest health monitoring	ISRO, PIRO
	The Forest Health Monitoring Program is a national program that makes annual evaluation of the condition, changes, and trends in health of forest ecosystems in the U.S. This pilot project is intended to test three vegetation indicators (understory diversity and general vegetation structure, down woody debris, and fuel loading) that will provide data to better evaluate diversity, vitality, conservation of soil, and carbon cycling. The variables in this field pilot will also provide information to evaluate the suitability of forest stands as wildlife habitat.			

27	Businski, Shirley A.	1992	Airphoto interpretation of vegetative cover change on the Sleeping Bear Dunes Complex, Leelanau County, Michigan, 1938-1987	SLBE
	Analysis of aerial photographs taken in 1938, 1973, and 1987 of the Sleeping Bear Dunes Complex in Michigan to describe trends and changes in vegetation cover. A geographic information system (GIS) was used to analyze and map data from aerial photographs. A classification system was developed to map the vegetation of the dunes. There are maps that show the vegetation cover for 1938, 1973, and 1987. There are ground photographs that show examples of the classification system for the vegetation types: unvegetated; barren with isolated plants; discontinuous grass; continuous grass; grass and partial shrubs; grass and dense shrubs; grass, shrubs, and trees; and forest.			
28	Carleton, T.J., Maycock, P.F.	1978	Dynamics of the boreal forest south of James Bay; Canadian Journal of Botany	APIS, GRPO, ISRO, PIRO, SACN, SLBE, VOYA
	Ordination models of approximate environmental and dynamic relationship between eight boreal tree species were constructed based upon principal components analysis and Kruskal's nonmetric multidimensional scaling. The assumptions inherent in these models are stated and discussed. &. Tree species developmental pathways & are, for the most part, short and circular with the exception of *Abies balsamea* . This reflects the establishment of similar, relatively monospecific stands following catastrophic forest destruction by fire and (or) other agencies. Where catastrophe does not intervene, deciduous primary forest species may succeeded by an understory of A. balsamea or by *Picea mariana* . Equally, some forest stands of primary establishment may become decadent with little or no subsequent tree growth. These observations are discussed with respect to the general notion of forest succession.			
29	Caron, James Albert, Jr.	1991	Responses of breeding common loons to human activity in the western Upper Peninsula of Michigan	PIRO
	Breeding success of the Common Loon is related to human activity on the Ottawa National Forest in the Upper Peninsula of MI. Data were gathered from 6 lakes within the Sylvania Recreation Area, where wheeled and motorized vehicles are restricted, and from 7 lakes that allow unrestricted use of watercraft. Loons were observed for courtship behavior, near shore position (seeking potential nest site), wailing (guard call), and/or territorial defense. Observations of nest attentiveness, number of times loon left nest and for what reason, predation, hatching success, and chick rearing behavior were made on a rotational basis through August or until hatching failure. A visibility index categorized nest concealment and was used to determine whether nest disturbance by humans was greater with higher visibility to humans. Loon territories and productivity in the 2 groups of lakes were compared. Human disturbance intensity index quantified frequency, intensity, and duration of 1522 individual incidents of human activity near loon nests; the index correlated a variety of human disturbance to nesting success. Management recommendations relate lake size and human recreational use.			
30	Chambers, B., Legasy, K., Bently, C.V.	1996	Forest plants of central Ontario	ISRO, VOYA
	"This handy field guide covers nearly 700 species of plants commonly found in the forests of central Ontario. Detailed species descriptions are combined with precise drawings and excellent colour photographs to make the plants of [this] region easy to identify. ... includes: edible plants, native uses of plants, wildlife uses of plants, related or similar species, 440 colour photographs, and 407 illustrations."			
31	Christiansen, Stacy R.	1998	Nest site selection of red-shouldered hawk, red-tailed hawk, and northern goshawk in the Upper Peninsula, MI	PIRO
	Nesting site characteristics of 3 woodland raptors, the red-tailed hawk, red-shouldered hawk, and northern goshawk, were observed and compared during 1996-1997 in the central Upper Peninsula of Michigan. In addition, nest site characteristics were compared to random plots, and the breeding success of nesting pairs was noted. Transects 2-6 km long were established in the Hiawatha National Forest, Pictured Rocks National Lakeshore, and Dickinson County. At 400 m intervals, a tape recording of each species' vocalizations was played 3 times each, in 3 directions beginning in May. Observers noted response calls and fly-ins and, subsequently checked for nests, nestlings, and prey remains. At nest sites the tree species, tree height, diameter at breast height (dbh), height of nest, tree density, canopy cover, and slope of hill were noted. Average size of nest tree, canopy density in nesting area, and height of nests above forest floor were compared among the 3 raptor species. Prey species, predator species, and wing-spans of the raptors were discussed in relation to nest site characteristics.			

32	City of Anoka	2003	Chapter 13: Mississippi River corridor plan: critical area and Mississippi National River and Recreation Area: formal review draft; Anoka community plan	MISS
	The chapter outlines the update of the City of Anoka's Mississippi River Critical Area Plan (1979). The update includes the cities of Ramsey and Champlin, as well. Regulations pertaining to the development of the river corridor are described. The establishment of the Mississippi National River and Recreation Area since the last Critical Area Plan is also mentioned. The environmental features and land use of the area are described, as well.			
33	City Of Champlin	no date	City of Champlin Mississippi River critical area plan	MISS
	The development of this plan responds to a state mandate calling for the protection of the Mississippi River corridor. Land use maps of the river section flowing through the city are provided. An inventory of resources is followed by a list of land use element (zoning, regulations, etc.) and public facilities found or planned for the city.			
34	Clark, J.S.	1990	Fire and climate change during the last 750 yr in northern Minnesota; Ecological Monographs	APIS, GRPO, ISRO, VOYA
	Charcoal stratigraphic analysis and fire scars on red pine were used to determine spatial and temporal occurrence of fire in 1 [square kilometer] of old-growth mixed conifer/hardwood forest in northwestern Minnesota. The combined methods for fire-history analysis provided a more detailed spatial and temporal documentation of fire regimes than has previously been possible from analysis of fire scars or of charcoal counts derived from fossil pollen preparations. Because climate varies continuously, the responsiveness of disturbance regime to short- and long-term climatic change suggests caution in the interpretation of fire frequencies that derive from space/time analogies or extrapolation from short-term data.			
35	Cole, Glen F.	1982	A boreal forest park: problems and approaches; Park Science	VOYA
	General information article which gives a history of the area now encompassed by Voyageurs National Park, and recommends actions that should be taken to preserve representative examples of the natural southern boreal forest environments and their native wildlife found in the park.			
36	Cole, Glen F.	1985	Changes in interacting species with disturbance	VOYA
	A system of sixteen interacting native herbivores and carnivores became less diverse, less stable and less productive over an 85 year period after uncontrolled hunting eliminated woodland caribou and elk and reduced moose to remnant numbers. Moose and caribou were the most dominant in total biomass while elk and white-tailed deer were subordinate cervids. Declines in total cervid biomass and food for carnivores were deferred for about 40 years by compensating increases in deer as other cervids became less abundant or absent. The system's diversity in species with different abilities to maintain or change the stability of their own or other populations suggested a possible solution to the problem of predicting the stability of populations in disturbed systems. The changes in diversity, stability and biomass of the studied fauna are used to develop generic hypotheses for initially predicting and subsequently measuring the effects of disturbance or restoration programs on interacting species.			
37	Cooper, William Skinner	1913	The climax forest of Isle Royale, Lake Superior, and its development contributions from the Hull Botanical Laboratory 165 (with map and fifty-five figures); The Botanical Gazette	ISRO
	Classic ecological treatise by one of the world's foremost plant ecologists. The purpose Part I is to determine the climax forest of Isle Royale, its composition and character, and to trace the various lines of succession leading to it. It is thus a successional study of a small component portion of the northeastern conifer forest. Part II describes the subsuccessions of rock shore succession; also describes beach succession. Part III describes the stages of bog succession and the two types of bogs present on Isle Royale. Also discusses burn succession. Summarizes the serarch and hydrarch successions. Dr. Cooper's obituary published the Geological Society of America notes that this paper can also be found in: Egerton, Frank N., Editor, American Plant Ecology, 1897-1917: New York, Arno Press.			
38	Cooper, William Skinner	1913	The climax forest of Isle Royale, Lake Superior, and its development: Contributions from the Hull Botanical Laboratory 165 (with map and fifty-five figures); Botanical Gazette	ISRO
	Eastern North American north of Florida and Mexico is divided into two great phytogeographic regions, the eastern deciduous forest and the northern conifer forest. In each of these, a number of lines of succession may be traced, all those of a region leading to a certain forest type as the final or climax stage. The purpose of the present work was to determine the climax forest of Isle Royale, its composition and character, and to trace the various lines of succession leading to it. It is thus a successional study of a small component portion of the northeaster conifer forest.			

39	Cooper, William S.	1928	Seventeen years of successional change upon Isle Royale, Lake Superior; Ecology	ISRO
	At the present time we have attained to a considerable knowledge of the manner of succession and the causes thereof. One phase of the subject remains still obscure: the rate of successional change. In 1909 and 1910 I carried out an investigation of the vegetational successions upon Isle Royale, in Lake Superior, in course of which I made many photographs and laid out a number of quadrats. When in 1926 an opportunity to revisit the island presented itself I succeeded in locating the positions from which a number of important pictures were made on my earlier visits, and a comparison of the pairs thus obtained reveals facts that are decidedly worth putting on record.			
40	Davis, Mary Byrd	1993	Old growth in the east	ISRO
	This book describes areas of the eastern United States containing old growth forest. A short section on Isle Royale National Park is included. This summary was written from a photocopy of the portion of the book containing the Isle Royale information. The entire book was unavailable.			
41	Deeming, J.E., Lancaster, J.W., Fosberg, M.A., Furman, R.W., Schroeder, M.J.	1974	National fire-danger rating system	VOYA
	The National Fire-Danger Rating (NFDR) System produces three indexes - Occurrence, Burning, and Fire Load - that measure relative fire potentials. These are derived from fire behavior components - Spread, Energy Release, and Ignition - plus a consideration of Risk. The NFDR System is solidly based on the physics of fire behavior - it is not empirical or statistical. It makes use of fuel models, an open-ended means of treating the myriad of naturally occurring fuel situations. Fuel moisture, wind, and risk are the principle variables accounting for the day-to-day fluctuations of fire danger. Instructions and tables necessary to manually compute the indexes and components for all nine fuel models are presented.			
42	Dlutkowski, Susan, Stottlemyer, Robert	1988	Ecological factors controlling nineteenth-century forest vegetation in the Great Lakes basin; Apostle Islands NL Research Reports	APIS
	The objective of this study is to quantify the extent of major forest species during presettlement time (before 1850), and identify the major ecological factors responsible for their distribution. Methods which have traditionally been employed to assess this question include General Land Office surveys, lake/bog sediment analyses, intensive quantification of living and dead plant matter, historical records, and combinations of these methods. The use of General Land Office survey data to quantitatively assess historical vegetation patterns has been minimal, but if combined with climate and soils data it could yield potentially valuable regional results. Definitive results from paleoecological study remain limited by the relatively low number of sites assessed and what can be interpreted from the results. The study of mechanisms operating over time at the local level has been minimal. Such study, especially if integrated with climate and soils data, probably as the most potential in explaining present and past plant occurrences in national parks. Several additional potentially valuable study proposals are outlined.			
43	Duncan, Nancy S.	1989	Testing of the habitat suitability index models; moose, Lake Superior region - a geographic information systems approach (July 1, 1989 - December 31, 1989)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report.			
44	Duncan, Nancy S.	1990	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach (January 1, 1990 - June 30, 1990)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report.			
45	Duncan, Nancy S.	1992	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach (July 1, 1991 - December 31, 1991)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report. Data was collected from sample plots in Voyageurs National Park.			

46	Dunevitz, Vicki L., Otto, Dale K., Hiebert, Ronald D.	no date	An ecological study of the Chellberg Forest sugar bush: Indiana Dunes National Lakeshore: A report to management	INDU
	The report examines the structural and compositional structure of the Chellberg Forest of the Indiana Dunes National Lakeshore. The size and vigor of the sugar maple population on the site is examined, and a determination of age/size class relationships within the sugar maple population is made in order to make predictions regarding the future status of sugar maples on the site. Quantitative measurements of other tree species in the forest are also made, and management recommendations are offered. A collection of tables relevant to the study data is also provided.			
47	Fedkenheuer, A. William	1975	Past and present forest communities of St Croix State Park, Minnesota and their use in determining ecomanagement direction	SACN
	Describes pre-settlement vegetation in the St. Croix State Park area and details current vegetation in 31 forest stands over a range of ecological conditions. Makes comparisons and recommendations for restoration and management.			
48	Fettig, Stephen M.	1995	Succession in a yellow birch forest subject to moose browsing	ISRO
	Herbivory by moose can alter forest structure and composition by slowing or preventing vertical growth of browsed tree species. Changes in plant cover were examined on fixed plots in a yellow birch-dominated uplant forest of southwestern Isle Royale. Percent cover in 7 height strata was recorded on 37 plots, first in the 1960s and again on the same plots in 1992. During the interval, percent cover decreased in the 1-m and 2-m strata. Percent cover increased in the 8-m stratum. This increase could be due to upward growth of vegetation beyond the reach of moose early in the study period. Balsam fir and white birch decreased in the canopy. White spruce, which is not browsed by moose, increased in the 4-m stratum. Sugar maple, mountain maple, yellow birch, paper birch, and mountain ash decreased in strata reachable by moose. At densities > 3 moose/km2, as older canopy-height trees have died, herbivory by moose has apparently been shifting the canopy composition away from a mosaic of yellow birch, white spruce, balsam fir, white cedar, and sugar maple toward an open white spruce or white cedar structure.			
49	Flaccus, Edward, Ohmann, Lewis F.	1964	Old-growth northern hardwood forests in northeastern Minnesota; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	Ten essentially undisturbed old-growth stands, growing on upland, well-drained sites, were sample to describe the composition of the northern hardwood forest in a region close to its western limits. Nine of the ten stands lie in a belt along the north shore of Lake Superior. Stand composition is compared with that of ten stands, lying eastward in Wisconsin and westward in Minnesota, from published studies by others. Species changes along east-west and north-south topoclines are described.			
50	Fraundorf, William J.	1984	Forest vegetation: inventory and management recommendations, Outer Island, Apostle Islands National	APIS
	The objective of this thesis was to inventory, and develop "detailed working plans" (management recommendations) for the forest vegetation of Outer Island. Eight major vegetation-types were identified on Outer Island. The forest vegetation-types were quantitatively sampled and comparisons were made with original forest vegetation conditions to determine which forest species needed to be actively managed in the attempt to re-establish original forest conditions on Outer Island. Original and current forest vegetation comparisons identified hemlock, yellow birch, white pine, and red pine as the "target species" of management activities. The eight vegetation-types previously identified were mapped in greater detail for the purpose of identifying areas on Outer Island believed to be climatically suitable to the regeneration of the target species listed above.			
51	Frederick, Douglas J., Rakestraw, Lawrence	1976	A forest type map of Pictured Rocks and Apostle Islands National Lakeshore from the original General Land Office Survey records	APIS
	The objectives of this project were to produce presettlement vegetation type maps of the lands encompassing the Pictured Rocks and Apostle Islands National Lakeshores. Along with the maps, survey techniques and the surveyors who did the work were researched. The land-use history occurring on these two areas was traced over the last 125 years and a comparison of present forests with original forest conditions is presented.			

52	Frederick, Douglas J., Rakestraw, Lawrence	1976	A forest type map of Pictured Rocks and Apostle Islands National Lakeshore from the original General Land Office survey records: a final report submitted to the National Park Service	PIRO
	Notes from land surveys conducted by the General Land Office during the mid 19th century of what is currently Pictured Rocks National Lakeshore, MI and Apostle Islands National Lakeshore, WI were used to create pre-European settlement vegetation maps. Data on bearing trees, line trees, natural features, and fauna (including human impact) that were recorded by the surveyors were analyzed and importance values were computed for all plant species. Seven forest types were described for Pictured Rocks and 12 types were described for Apostle Islands National Lakeshores. Historical vegetation maps for the mid 19th century were created.			
53	Frederick, Douglas J., Rakestraw, Lawrence, Eder, Christopher R., Van Dyke, Robert A.	1977	Original forest vegetation of the Pictured Rocks National Lakeshore and a comparison with present conditions; Michigan Academician	PIRO
	Forest data collected by surveyors in the 1840s and 1850s are compared with those collected by the researchers prior to publication. Historic data collected by the 19th century surveyor included bearing tree descriptions, line trees, cover type changes, tree species prevalence on each section line, topographic features, and soil types. The researchers determined forest types through ground reconnaissance, aerial photography, and timber type maps.			
54	Frederick, Douglas J., Rakestraw, Lawrence, Eder, Christopher R., Van Dyke, Robert A.	1977	Original forest vegetation of the Pictured Rocks National Lakeshore and a comparison with present conditions; First conference on scientific research in the National Parks	PIRO
	Surveyors' notes and data from 1840's through the 1850's were studied to reconstruct the forest vegetation of what is now Pictured Rocks National Lakeshore, MI. Information on the species and diameter of bearing trees; the species, diameter, and location of line trees; lakes, streams, and topographic features; soils; and fauna, including human presence, from these surveyors' notes was used to construct a vegetation map of the mid 1800's. The results are compared to present vegetation maps. Notes on the history of the logging of various tree species in the 19th and 20th centuries are given, as well as historic slash and crown fires. The results address the change in the age distribution (size) of the tree species and the changes of the extent of forest types. Maps of the reconstructed forest types for the mid 1800's are included.			
55	Frederick, Douglas J., Rakestraw, Lawrence, Eder, C.R., Van Dyke, R. A., Griewe, B. J.	1976	The original survey notes of Pictured Rocks and Apostle Islands National Lakeshore and their use in reconstructing original forests; proceedings on the first conference for scientific research in the National Parks	APIS
	A reconstruction of pre-disturbance forest vegetation was attempted through the use of original General Land Office survey notes, U.S.G.S. maps, and county survey maps. Statistical tests on section and corner trees showed some bias for surveyors selecting certain tree species and diameters. The bias was not considered critical. A computer program was developed that assigns cover types based on importance values to each section and quarter corner. By comparing and contrasting the surveyors and the data and descriptions that are recorded for Apostle Islands NL and Pictured Rocks NL, it was found that a considerable difference exists between the surveyors of these two areas and the detail of their work. This directly affected the use of these data for reconstructing the original forest vegetation. The value of type maps of any area using original survey notes are contingent upon the preceding factors plus the instructions to the survey crews at the time the survey was done. If these variables are taken into account, such maps can be used as an ecological database for planning and management.			
56	Frelich, L.E.	2002	Forest Dynamics and Disturbance Regimes	GRPO, ISRO, PIRO, SLBE, VOYA
	More than a quarter of the world’s forests lie within the cool-to-cold temperate zones of the northern and southern hemisphere. This book provides a major contribution to the study of forest dynamics by considering three important themes: (1) the combined influence of the three major disturbance types: wind, fire and herbivory; on the successional trajectories and structural characteristics of forests; (2) the interaction of deciduous and evergreen tree species to form various mosaics which, in turn, differentially influence the environment and disturbance regime; and (3) the significance of temporal and spatial scale with regard to the overall impact of other disturbances. These themes are explored via case studies in the Lakes States of the USA (MN, WI and MI).			
57	Frelich, L.E.	1998	Disturbance ecology and the Great Lakes forest	APIS, GRPO, ISRO, PIRO, VOYA
	This is a packet of materials distributed during a lecture by the same name apparently conducted by Lee. E. Frelich of the University of Minnesota Department of Forest Resources. Included are a number of handouts dealing with disturbance (especially fire) regimes and effects, and two papers. The papers are titled, Natural disturbance and variability of forested ecosystems in northern Minnesota, and Disturbance ecology and the Great Lakes Forest, both by Lee E. Frelich.			

58	Frelich, L.E.	1999	Range of natural variability in forest structure for the Northern Superior Uplands	GRPO, VOYA
	"The purpose of this report is to elucidate the landscape age structure of different forest types (or ecosystem types) in the Northern Superior Uplands section of northeastern Minnesota under the natural disturbance regime in effect during presettlement times (1600-1900). To do this, I provide a successional pathway among several vegetational growth stages (VGS) for each forest type, then show a reasonable range of the proportion of the landscape in each VGS given the historic disturbance regime for that forest type. ...."			
59	Frelich, L.E., Carlton, D.	2001	Final ecological and fire conditions Boundary Waters Canoe Area Wilderness	APIS, GRPO, ISRO, PIRO, VOYA
	The Boundary Waters Canoe Area Wilderness on the Superior National Forest is one of the most heavily used wilderness areas in the United States. On July 4, 1999, heavy rains and straight-line winds greater than 90 miles per hour caused extensive forest blowdown and flooding throughout northeastern Minnesota and adjacent areas in Canada. The windstorm increased the amount of dead and down material on the ground. These materials, called slash fuel, increased from 5 to 20 tons per acre to 50 to 100 tons per acre. This increase in material on the ground will allow ignition, development, and rapid spread of high-intensity fires that are difficult to control under a wide variety of weather conditions. Under the right weather conditions, there is an increased potential for wildfire within the Wilderness that could move from within the Wilderness to adjacent private, State, and National lands or across the international border into Canada.			
60	Frelich, L.E., Reich, P.B.	1995	Spatial patterns and succession in a Minnesota southern boreal forest; Ecological Monographs	GRPO, VOYA
	Succession was studied in a cold-temperate forest in the Boundary Waters Canoe Area Wilderness of northeastern Minnesota. The 13 X 18 km study area comprises a complex forest mixture of jack pine and other pines, quaking aspen, paper birch, black spruce, balsam fir and white cedar on thin soils over the Canadian Shield bedrock. The main objectives of this study were to examine the relationships between spatial patchiness, spatial scale, and canopy succession in the southern boreal forest of the BWCAW, and to evaluate under what conditions successional direction may remain stable, converge, or diverge. Results show that reduced fire frequency on recent years has changed the dominant successional pathways.			
61	Galat, David L., Frazier, Ann G.	1996	Overview of river-floodplain ecology in the Upper Mississippi River Basin; science for floodplain management into the 21st Century	MISS
	This is a compilation of unpublished papers concerning the river's floodplain ecology. Selections include assessing the resource, assessing flood impacts, analyzing forests and fauna, restoration, and a wildlife inventory. Also includes a selected annotated bibliography of the ecology of the upper Mississippi.			
62	Galley, K.E.M., Wilson, T.P.	2001	Proceedings of the invasive species workshop: the role of fire in the control and spread of invasive species; Invasive Species Workshop	APIS, ARPO, BUFF, CUVA, EFMO, GRPO, GWCA, HEHO, HOCU, HOME, HOSP, INDU, ISRO, LIBO, MISS, OZAR, PERI, PIPE, PIRO, SACN, SLBE, TAPR, VOYA, WICR
	The purpose of the Fire and Invasive Species workshop was to asses the state of knowledge of the interactions of fire and invasive plants, including fire management practices related to control and susceptibility, influence of invasive species on fire regimes, influence of fire on invasive species, and influence of land use and land management practices on invasive species and fire. A further purpose was to identify management information needs and related research needs and priorities, and to raise national awareness of fire invasive species issues. Although the issue of fire and invasive plant is often viewed as a problem predominantly in the western states, the workshop attempts to provide a national perspective of fire and invasive plants in the United States. The workshop proceedings are organized according to major ecoregions represented in the U.S.			
63	Gillespie, A.R., Parker, G.R., Pope, P.E., Rink, G., Editors	1993	Proceedings, 9th Central hardwood forest conference; general technical reports	INDU, LIBO, SLBE
	".... Presentations encompassed forest biology, protection, silviculture, ecology, inventory, yield, economics, marketing, wildlife management, soils, and nutrition of the central hardwood forests."			

64	Goebel, Charles, Corace, R. Gregory, III, Wyse, Thomas C.; National Park Service	2003	Identifying reference conditions of disturbed ecosystems and applications for maintaining openland avian diversity at Sleeping Bear Dunes National Lakeshore; Western Great Lakes research conference and Chequamegon Bay area natural resource conference: Abstracts	ISRO, PIRO, SLBE
	Using glacial geology, soil, and undisturbed vegetation data from Huron-Manistee National Forest, reference plant communities were identified for Sleeping Bear Dunes National Lakeshore. The reference data was then integrated with land use-land cover data in a geographic information system to identify locations for possible forest restoration. Predictions on successional trajectories and the success of restoration were made, as well.			
65	Gorman, K., Morgan, P.	2001	To burn or not to burn in Isle Royale National Park, Michigan	APIS, GRPO, ISRO, PIRO, VOYA
	Isle Royale National Park has permitted lightning-ignited fires to burn undisturbed under prescribed conditions since 1982, but managers have speculated that the total area burned represents only a small fraction of the area burned under the natural fire regime. The use of prescribed fire could be justified if the current fire regime is significantly different, due to suppression activities, than it was historically. I examined historical fire occurrence and the response to fire of vegetation on the island to assess whether the current fire regime on Isle Royale is outside of the range of natural variability. I conclude that there is not sufficient evidence to justify the use of prescribed fire in Isle Royale National Park because the current wildland fire use policy is sufficient to allow fire to play its natural role in the ecosystem.			
66	Griffin, R. A, Frost, R. R., Shimp, N. F.	1976	Effect of pH on removal of heavy metals from leachates by clay minerals; residual management by land disposal; proceedings of the hazardous waste research symposium	INDU
	no abstract available			
67	Grigal, David F.	1988	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach: a research proposal	VOYA
	This research proposal is designed to test the Habitat Suitability Index model for Moose of the Superior Region. Moose are an integral part of the southern boreal forest ecosystem, and the ability to predict potential impacts of resource manipulation on moose habitat is essential to the land management process. Field testing of both Model I and Model II in the moose HSI model (Allen et al. 1988) will be done utilizing Geographic Information Systems in areas of Voyageurs National Park and Superior National Forest. These two areas have different management goals and activities, reflected in different seral stages of vegetation, so comparisons of moose habitat can be made and an assessment of impacts of resource mainpulation formulated. Also see progress reports by Nancy Duncan, PH.D candidate.			
68	Grigal, David F.	1989	Testing of the habitat suitability index model for moose in Voyageurs National Park and adjacent areas of Superior National Forest - a geographic information systems approach	VOYA
	This is a June 1989 revision of the actual cooperative agreement between the National Park Service and the University of Minnesota (same title). Study objectives, individual party responsibilities, and budget are described.			
69	Hairston, Anne B, Grigal, David F.	1994	Topographic variation in soil water and nitrogen for two forested landforms in Minnesota, USA; Geoderma	SACN
	Relationships between topographic position and soil water, soil nitrogen (N), and tree growth were examined on two regional landforms in Minnesota. The study was conducted in northern pin oak stands on an outwash plain, and in aspen stands on a ground moraine complex. Differences in soil water were significant ($p<0.05$) among slope positions at both locations, but they differed more strongly in the subdued outwash plain than in the steeper moraine due to a shallow water table. Only soil water in lower slope positions in the moraine differed significantly between concave and convex across-slope shapes ($p<0.05$). In the outwash plain, organic matter and N of the upper soil horizon were related to slope position, while organic matter and total N in the forest floor and anaerobically released N in the upper soil horizon were related more strongly to aspect. In the outwash plain, tree growth rates differed by slope position and aspect; in the moraine, tree volume differed by slope position ($p<0.10$). Assumptions about differences in soil properties among topographic positions that are based on generalized models should be tempered by influences of landform and soil materials.			

70	Hansen, Henry L., Krefting, Laurits W., Kurmis, Vilis	1973	The forest of Isle Royale in relation to fire history and wildlife; Minnesota Agricultural Experiment Station Technical Bulletin 294 Forestry Series 13	ISRO
	This study had several objectives. The broad objective was to explore the unique advantages of a large wilderness island as a field laboratory for advancing the knowledge of forest ecosystems. Special reference was placed on forest succession, fire history, browse production, and the role of primary production as the homeostatic control of moose populations. Within this framework were several more specific goals: (1) To identify and describe major forest types according to tree, regeneration, shrub, and herbaceous components. This information is needed for other studies. It's been available only in fragments for the island; (2) To associate primary and secondary successional trends in forest types with their conseqences to populations of several wildlife species, especially moose.			
71	Harrington, M.G.	1987	Predicting reduction of natural fuels by prescribed burning under ponderosa pine in southeastern Arizona	VOYA
	Results from 10 prescribed burns conducted under different weather and fuel conditions in ponderosa pine stands in southeastern Arizona indicate that forest floor fuel consumption can be estimated using H-layer moisture content, and either preburn forest floor depth or stand density. Equations presented give forest managers the ability to estimate, and thus prescribe, amounts of fuel that would be consumed by prescribed fire or unplanned ignition.			
72	Hazlett, Brian T.	1986	The terrestrial vegetation and flora of the mainland portion of Sleeping Bear Dunes National Lakeshore, Benzie and Leelanau Counties, Michigan	SLBE
	The mainland portion of Sleeping Bear Dunes National Lakeshore (SLBE), Michigan was surveyed for terrestrial vegetation and flora. The vegetation associations were mapped and described to produce a catalogue of 704 vascular plants. For each species, the following is listed: scientific and common names, relative abundance, common habitats, and collection numbers. Ten permanent plots were established to monitor future vegetation changes at selected sites. A potentially new species of Botrichyum was discovered on perched dunes of SLBE. There are recommendations concerning the resource management of the mainland were proposed. There are maps showing the locations of the mainland permanent plots and the mainland distribution of special status species. There is a list of cultivated and persisting species.			
73	Hazlett, Brian T.	1987	Reconnaissance report on the vegetation of the coastal dunes east of Platte River Point, Benzie Co, Michigan	SLBE
	A description of the vegetation on the coastal dunes east of Platte River along Platte Bay, Sleeping Bear Dunes National Lakeshore, Michigan. Vegetation and habitat descriptions were made along a series of transects that were set up perpendicular to the beach. The following habitats are described: beach and foredune, open dunes, dune pools and jack pine stands, and bordering forests. There is a map showing the approximate locations of the transects. There is a list of species (scientific and common names).			
74	Hazlett, Brian T., Vande Kopple, Robert J.	1983	The terrestrial vegetation and flora of north and south Manitou Islands, Sleeping Bear Dunes National Lakeshore, Leelanau County, Michigan	SLBE
	The vegetation and flora of North and South Manitou Islands, Sleeping Bear Dunes National Lakeshore, MI were surveyed to produce a catalogue of 490 vascular plant species. For each species the following are listed: scientific and common names, relative abundance, common habitats, collection numbers, and whether it is found on North and/or South Manitou Island. Twenty permanent vegetation plots and deer exclosures were established on the islands to monitor vegetation changes. There was a noticeable difference in forest structure and floristic composition between the islands due to the introduced deer herd on North Manitou Island. Recommendations concerning the resource management of the islands are presented. There are maps showing the locations of the permanent vegetation plots and the distribution of special status (State of Michigan listed) species on the islands.			
75	Hely, C., Flannigan, M., Bergeron, Y., McRae, D.	2001	Role of vegetation and fire weather on fire behavior in the Canadian mixedwood boreal forest using two fire behavior prediction systems; Canadian Journal of Forest Research	APIS, GRPO, ISRO, PIRO, VOYA
	"Spring and summer simulations were carried out using the Canadian Fire Behavior Prediction (FBP) and U.S. BEHAVE systems to study the role of vegetation and weather on fire behavior in the mixedwood boreal forest. ... The predicted fire behavior variables were rate of spread (ROS), head fire intensity (HFI), and area burned. Results from ANOVA testing showed that both weather and vegetation are not always significant, and the two prediction systems qualitatively attribute the explained variance to these factors differently. The FBP System selects the weather factor as the most important factor for all fire behavior variables, whereas BEHAVE selects the vegetation factor. However, three research burns located in Ontario revealed that BEHAVE was not well adapted to the mixedwood boreal region, whereas FBP predictions were quantitatively close to observed prescribed values. ...."			

76	Hepinstall, Jeffrey Ahrens	1992	Application of the Lake Superior region moose Habitat Suitability Index Model to an area of the Superior National Forest using a Geographic Information System	VOYA
	This thesis is organized as four semi-independent papers. The first paper discussed the Habitat Suitability Index (HSI) concept in general and the Lake Superior region moose HSI in particular. The second paper consists of the results of field work conducted during the late winter of 1992 in the Coffee Creek Opportunity Area, Tofte District, Superior National Forest. The third paper describes a method for applying the moose HSI using only information readily available at the Forest Service district level. The fourth paper is a manuscript in preparation for submission to a geographic information system-based (GIS) journal and is aimed at a GIS-literate audience. It explores methods for calculating the moose HSI using GIS. Several techniques, including moving habitat windows and boundary value estimation are explored and the results compared. Results of the sensitivity analyses indicate that moose habitat suitability is sensitive to different soils (Ecological Land Type, ELT), vegetation (Forest Survey Type, FST), or tree size and stocking (Stand Size Class, SSC). HSI results are especially sensitive to changes in FST 91 (aspen) and 95 (aspen-white spruce-balsam fir).			
77	Iverson, L.R., Prasad, A.M., Hale, B.J., Sutherland, E.K.	1999	Atlas of current and potential future distributions of common trees of the eastern United States	VOYA
	This atlas documents the current and possible future distribution, provides detailed information on environmental characteristics defining the distribution, provides detailed information on the life history characteristics, and provides summary statistics of 80 common tree species in the Eastern United States. Intended to supplement other publications on forest tree species, much of the data provided here are derived from Forest Inventory and Analysis (FIA) data, analyzed in concert with 33 environmental variables within a geographic information system. Life history information, including detailed regeneration and disturbance characteristics, were generated via the literature and are provided in database format. Summary statistics give overall perspective on the tree species of the Eastern United States. Regression tree analysis models were constructed to determine possible future habitat for each species under two scenarios of global climate change.			
78	Jakala, Stephen G.	1992	VOYA fire effects monitoring program summary	VOYA
	Thirteen upland community types occur in Voyageur's conditional fire management and fire suppression units. A projected 60 plots need to be established to monitor the success of Voyageurs' ignited prescribed burn program. This report briefly summarizes program achievements to date, including numbers of plots established, and number of plots burned. No descriptions or maps of plots are included.			
79	Janke, R.A., Mckaig, D., Raymond, R.	1978	Comparison of presettlement and modern upland boreal forests on Isle Royale National Park; Forest Science	ISRO, VOYA
	The presettlement upland boreal forest type of Isle Royale National Park, as reconstructed from the original land survey notes of 1847-48, was compared with the existing forest as sampled in 1974. A drastic reduction in balsam fir and an increase in white birch as aspen have occurred. These changes are attributed to the high frequency of man-caused fires since 1848.			
80	Janke, Robert A.	1973	Annual report of the research project: The ecology of the boreal forest-type of Isle Royale National Park	ISRO
	no abstract available			
81	Janke, Robert A.	1975	The ecology of the boreal forest-type of Isle Royale National Park	ISRO
	no abstract available			
82	Janke, Robert A., Lowther, John L.	1981	Post-fire succession in the boreal forest type of Isle Royale National Park; Proc 2nd Conference of Research in the National Parks, San Francisco	ISRO
	Post fire successional trends in tree species composition, forest flammability, and ground cover species composition were studied by comparison of these parameters in approximately 200 forest stands of different age. Results indicate a shift in dominance from white birch and/or quaking aspen to white spruce and balsam fir. The inflammability of the forest is shown to increase with time. Vascular ground cover plants also undergo marked changes. Most species increase progressively with time, decrease progressively with time, or rise to a peak value at intermediate ages and decline again as maturity is approached.			

83	Johnson, E.A.	1992	Fire and vegetation dynamics: studies from the North American boreal forest	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	"This book sets out to [describe the "causal connection between the behavior of fire and its ecological consequences"] by assembling the relevant studies of fire intensity, rate of spread, fuel consumption, fire frequency, and fire weather in the North American boreal forest. The central thesis is that [this] forest has at least four wildfire characteristics that are important in understanding the dynamics of its plant populations: the large size of the burns with respect to dispersal distances, the short recurrence time of fire with respect to tree life spans, the high mortality of plants due to the predominance of crown fires, and a good germination surface due to the large area of the forest floor which is covered by ash."			
84	Johnson, E.A., Miyanishi, K., Bridge, S.R.J.	2001	Wildfire regime in the boreal forest and the idea of suppression and fuel buildup; Conservation Biology	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	The explanation often given for the large wildfires that have burned each year in North America in the last two decades is that fire suppression after the 1950s produced a buildup of fuel and changed the landscape-age mosaic, creating conditions for catastrophic fires. Unfortunately, this fuel-buildup idea has been uncritically and inappropriately applied to closed-canopy ecosystems that have always have crown-fire regimes. We show here that the idea of fuel buildup is also invalid for the boreal and sub-alpine forest, another closed-canopy ecosystem with a crown-fire regime.			
85	Johnston, Carol A., Cohen, Yosef, Pastor, John; Goodchild, Michael F., Steyaert, Louis T., Parks, Bradley O., Johnston, Carol, Maidment, David, Crane, Michael, Glendinning, Sandi	1996	Modeling of spatially static and dynamic ecological processes; GIS and Environmental Modeling: progress and research issues	VOYA
	Spatiodynamic ecological models require incorporation of horizontal (and often vertical) movement, such as dispersal of propagules or organisms. This approach is standard in modeling watershed fluxes but uncommon for modeling organism movement because animals move in ways that are difficult to predict spatially and temporally. The use of two types of ecological models to predict landscape pattern is described: (1) Markov modeling of beaver ponds based on historical trends, and (2) spatial interpolation of a forest simulation model to predict effects of climate change on tree species distribution.			
86	Johnston, Carol A., Pastor, John, Naiman, Robert J.; Haines-Young, Roy, Green, David R., Cousins, Steven	1993	Effects of beaver and moose on boreal forest landscapes; Landscape Ecology and Geographic Information Systems	VOYA
	"A combination of GIS, air-photo interpretation, and field techniques were used to determine the influence of beaver ponds on landscape processes on the Kabetogama Peninsula of Voyageurs National Park. The primary objective is to examine the effects of beaver and moose on boreal forest ecosystems, and "to illustrate how GIS was an indispensable tool for extrapolating field data to the landscape as a whole and for deriving landscape ecological relationships which would have been impossible using traditional field methods." (excerpts from authors introduction).			
87	Johnston, Carol A., Updegraff, Karen, Bridgham, Scott D., Pastor, John	1991	Influence of beaver and bogs on greenhouse gases at Voyageurs National Park	VOYA
	The potential for increased methane emission from boreal regions is of key concern to scientists and policy makers because the boreal biome is global in extent, stores large amounts of carbon, is a strong source of trace gases, and is projected to become significantly warmer over the next 30 years. Field measurement of methane (CH4) and carbon dioxide (CO2) emissions from beaver ponds, sedge meadows, and peat bogs were made at Voyageurs National Park in northern Minnesota. By studying in situ and potential gas fluxes from different portions of the Voyageurs National Park landscape, the authors found that areas such as beaver ponds and meadows that constitute a relatively small proportion of the landscape can have a large influence on trace gas feedbacks to the atmosphere. This work was facilitated by a research environment conducive to the long-term study of landscape carbon dynamics and their potential feedbacks to global climate change.			
88	Jordan, Peter A.	1993	1993 investigators annual report - long-term studies of moose-forest interactions	ISRO
	The objective of this project is to survey the supply and utilization of browse and of the winter distribution of moose and snowshoe hares; and to quantify changes in forest succession due to moose herbivory. This report includes progress to date and significant findings through 1993.			

89	Jordan, Peter A., Campbell, J. Patrick; Van Stappen, Julie	1996	Experimental demonstration at Isle Royale of impacts by moose on the composition and structure of a mature-forest community, with implications of ecosystem effects (ABSTRACT); Proceedings of the Lake Superior National Parks research conference	ISRO
	Moose-proof exclosures were built on Isle Royale in the 1950s and in 1979. In this study, tagged saplings of all species present were measured both inside and outside the exclosures to determine the effect of moose browsing on tree density and height, and the density and diversity of ground layer herbs. Long-term ecosystem effects of moose browsing are discussed including the effects on forest composition and cycle of fire.			
90	Kessell, S.R., Fischer, W.C.	1981	Predicting postfire plant succession for fire management planning	VOYA
	Methods of organizing fire-related plant succession information into basic succession models are presented. Choice of resolution levels, data base, accuracy requirements, and methods are related to fire management needs and available information.			
91	Kotar, John, Burger, Timothy, Csysz, David	1992	Forest habitat type classification for Douglas County and Northern Bayfield and Ashland Counties; Forest habitat type classification for Douglas County and Northern Bayfield and Ashland Counties	APIS
	This preliminary field guide is a key to habitat types of Douglas County and northern Bayfield and Ashland Counties.			
92	Kyral, JoAnn; Heitkamp, Bret	1997	No Title	MISS
	The letter discusses the review by the Mississippi National River and Recreation Area (MNRRA) of the Master Development Plan for Galloway Park in Champlin, MN. The park is adjacent to the Mississippi River and falls within MNRRA boundaries.			
93	Larsen, William C.	1975	Vegetation ecology of Bear Island, Wisconsin, Apostle Islands National Lakeshore	APIS
	The present ecological condition of Bear Island, Apostle Islands National Lakeshore, was surveyed to determine the feasibility of locating recreational developmental sites on the islands. The main objective of the entire project was to collect basic resource data that could be used by park planners for locating developmental sites in areas that are best suited towards human use. Data were collected to determine the relationships between the soils, vegetation and animals occurring on the island. This paper is limited to discussing the vegetation and the interrelationships of the soils, geology and plant communities identified on Bear Island. It was found that species vary in their amplitude of tolerance to habitat conditions with a few species having a wide range while the majority of species exhibit a narrow range and are restricted to being important within one or two community types. Species with similar narrow ranges of amplitude to environmental conditions occurred within the same community type.			
94	Latham, D.J., Rothermel, R.C.	1993	Probability of fire-stopping precipitation events	VOYA
	Fire managers in the Northwestern United States are often confronted with the problem of determining when precipitation might stop an ongoing fire. The possibility that a useful probability for fire-stopping precipitation could be developed from historical weather records was investigated. Persons familiar with weather and fire behavior suggested a fire-stopping precipitation criterion of "at least 0.5 inches of precipitation in 5 days or less." Daily precipitation data from four fire weather stations for the period 1970 to 1985 were used to estimate the chance that the criterion would be satisfied by a specified date in the fire season. The Weibull probability distribution was found to be an excellent fit for the problem. The method of fitting the distribution to the data is described and results given for four weather stations in the Northern Rocky Mountains. This method can be applied to other "fire-stopping" criteria using the same technique.			
95	Leatherberry, E.C.	1991	Forest statistics for Minnesota's Central Hardwood Unit; Resource Bulletin	GRPO, MISS, SACN, VOYA
	In 1990, the fifth inventory of Minnesotas Central Hardwood Unit found 11.9 million acres of land, of which 2.4 million acres are forested. This bulletin presents statistical highlights and contains detailed tables of forest area, as well as timber volume, growth, removals, mortality, and ownership.			
96	Leatherberry, Earl C., Spencer, John S. Jr., Schmidt, Thomas L., Carroll, Michael R.	1995	An analysis of Minnesota's fifth forest resources inventory, 1990	VOYA
	Forest Inventory and Analysis (FIA) is a continuing endeavor to periodically inventory the Nation's forest land to determine its extent condition, volume of timber, growth, and removals. This data is reported by county.			

97	Lejeune, Katherine Dodds	1991	Spatial pattern analysis of forest structure and species composition in a northern Minnesota forest	VOYA
	In this thesis, point pattern and multivariate analytical techniques were used to detect spatial pattern in the structure and composition of a forest in northern Minnesota, [within Voyageurs National Park], with the objective of understanding forest dynamics. Theoretically, the processes which drive forest dynamics, disturbance, competitive interactions, and physical and biotic influences, operate and impart pattern at characteristic scales. By using a hierarchical approach, multiple scales of pattern were identified in the four hectare stand. The strongest two were a small scale aggregation of individual trees (1-20 meters), and a larger scale community pattern in structure and composition (40-70 meters).			
98	Leutscher, Bruce; Belant, Jerry, Bruff, Gregg, Bruggink, John, Leonard, Jill, Route, Bill	2002	Vegetation sampling using an enhancement of Forest Inventory and Analysis hexagons; Western Great Lakes research conference	PIRO
	Progress report on a 3 year Forest Inventory and Analysis (FIA) at Pictured Rocks National Lakeshore, MI describes the hexagonal vegetation plot grid system used to sample vegetation structure, composition, and diversity. Downed woody debris, duff and litter also can be quantified. Analytical methods allow comparison of the vegetation of the Lakeshore to other forested areas in the region. In addition, the vegetation of federally owned lands comprising Pictured Rocks National Lakeshore can be compared to the Inland Buffer Zone of the Lakeshore, where timber harvesting occurs. A progress report provides information concerning the number of vegetation plots sampled in 2001, and plans for the next 2 years.			
99	Loope, Walter L.	1990	Natural forest dynamism and the maintenance of biodiversity: an exploration of agency history and approach; Michigan Academician	PIRO
	Disturbance is addressed as an integral part of biodiversity in forested ecosystems. Theories and new views of vegetation dynamics are presented. Since one third of land in the U.S. is publicly owned, the public land agencies are recognized as critical in the maintenance of biodiversity. The National Park Service's mandate of natural resource preservation and the U.S. Forest Service's tradition of resource consumption and habitat manipulation are contrasted. However, the National Park Service lacks an emphasis on research, while the U.S. Forest Service has long maintained a research branch. At Pictured Rocks National Lakeshore, MI, wildfire, beaver, windthrows, movement of sand, and logging affect are discussed as causes of disturbance.			
100	Loope, Walter L., Anderton, John B.	no date	Cultural mediation of fire regime in coastal pine forests of Lake Superior	PIRO
	The report discusses the possibility of fire ignition by native peoples between 1700 and 1900.			
101	Loope, Walter L., Anderton, John B.	1993	Cultural mediation of fire regime in coastal pine forests of Lake Superior; Ecological Society of America Bulletin (Abstracts)	PIRO
	The role of native peoples in ignition of wildland fires in isolated pine patches along the Great Lakes' shorelines is inferred from archeological evidence about Ojibwa seasonal camps and from fire scarred trees and stumps. Pine forests grow in isolated patches on excessively drained soils separated by deciduous forests along the shores of the upper Great Lakes. These pine patches usually surround the mouths of small rivers or streams where there is evidence that Ojibwa people had fishing camps. Fire scars indicate that understory fires occurred every 5-50 years prior to European settlement, yet lightening fire occurrence is not sufficient to explain these numbers of fires. The earliest General Land Office survey notes in 1840 indicate that Miners Basin of what is now Pictured Rocks National Lakeshore, MI and the tombolo of Grand Island (presently Grand Island National Recreation Area, MI) were "park-like" (forested with little woody understory). Presently spruce and fir are common in the understory in these forests. Preliminary findings suggest that native peoples managed their resources with fire until their cultural patterns were disrupted due to the European settlement.			
102	Loope, Walter L., McEachern, A.K., Anderton, J.B.; Kenner, Brian	1994	Response of vegetation to climate-driven episodes of coastal disturbance along Lake Superior; Lake Superior National Parks research conference	PIRO
	The abstract describes the role of climate in the burial of a coastal pine forest around 5500 BP along the south shore of Lake Superior. Models were to be tested on plots in the Grand Sable Dunes.			

103	Lynham, T.J., Stocks, B.J.	1991	The natural fire regime of an unprotected section of the boreal forest in Canada; High Intensity Fire in Wildlands: Management Challenges and Options; 17th Tall Timbers Fire Ecology Conference	VOYA
	From 1982 to 1984, we investigated the fire periodicity of the boreal forest of northern Ontario on an upland jack pine site. &. The data suggest that over a 160-year period, the shortest and longest times between major fires were 5 and 30 years, respectively. The average fire periodicity was 20 years.			
104	MacLean, David B.	2002	Inventory of ground beetles and characterization of the vegetation of Grand Portage National Monument, Cook County, Minnesota	GRPO
	Pitfall trap arrays were placed in seven sites between Lake Superior and 5.5 miles inland along the Grand Portage. The sites were selected to represent a range of vegetation communities, and distance from potential disturbance (i.e., distance from village and lakeshore). Week-long sample periods occurred June-September 2002. Twelve genera and 33 species, some of which were first records for Minnesota. Principle component analysis was used to interpret species diversity in relation to habitat characteristics.			
105	Maycock, Paul F.	1961	The spruce-fir forests of the Keweenaw Peninsula, Northern Michigan; Ecology	ISRO
	no abstract available			
106	Maycock, P. F., Curtis, J. T.	1960	The phytosociology of the boreal conifer-hardwood forests of the Great Lakes region; Ecological Monographs	ISRO
	no abstract available			
107	Mcinnes, Pamela F.	1989	Moose browsing and boreal forest vegetation dynamics, Isle Royale, MI, USA	ISRO
	no abstract available			
108	Mcinnes, Pamela F., Naiman, Robert J., Pastor, John, Cohen, Yosef	no date	Effects of moose browsing on vegetation and litterfall of the Boreal Forest, Isle Royale, Michigan, USA	ISRO
	Four paired moose exclosures and browsed plots on ISRO were used to examine the influence of moose on above-ground biomass, production, and annual litterfall of boreal vegetation in 1987. Tree biomass was significantly greater, shrub biomass was significantly less and herb biomass was significantly less in exclosures than in browsed plots. Tree production was greater in exclosures than in browsed plots, but there was no difference in the production per unit biomass between exclosures and browsed plots. Shrub production in exclosures was similar to that of browsed plots. Litter production was greater in exclosures than in browsed plots, despite total vegetation biomass differences between paired plots. There was significantly greater herb litter produced in the browsed plots than in the exclosures. Moose browsing prevented saplings of preferred species from growing into the tree canopy, resulting in a forest with fewer canopy trees and a well developed understory of shrubs and herbs. Thus, browsing by moose influences the long-term structure and dynamics of the boreal forest ecosystem which has important implications for forest ecosystem management.			
109	Mcinnes, Pamela, Naiman, Robert J., Pastor, John, Cohen, Yosef	no date	Long-term changes caused by moose browsing in Isle Royale boreal plant communities; Journal of Wildlife Management (submitted)	ISRO
	no abstract available			
110	McInnes, Pamela, Naiman, Robert J., Pastor, John, Cohen, Yosef	1992	Effects of moose browsing on vegetation and litter-fall of boreal forest, Isle Royale, Michigan, USA; Ecology	ISRO
	Four paired moose exclosures and browsed plots on Isle Royale were used to examine the influence of moose on aboveground biomass, production and annual litterfall of boreal vegetation. Moose browsing prevented saplings of preferred species from growing into the tree canopy resulting in a forest with fewer canopy trees and a well-developed understory of shrubs and herbs. Browsing may have altered the balance of white spruce and balsam fir. Browsing by moose influences the long-term structure and dynamics of the boreal forest ecosystem.			
111	Mcinnes, Pamela, Pastor, John, Naiman, R. J., Cohen, Yosef	1988	The effect of protection from moose browsing on the vegetation and litter production on Isle Royale boreal forests; Bulletin of the Ecological Society of America (abstract)	ISRO
	no abstract available			

112	Mclaren, Brian E.	1996	Plant-specific response to herbivory: simulated browsing of suppressed balsam fir on Isle Royale; Ecology	ISRO
	Balsam fir experiences striking growth suppression from browsing of the understory of mixed, boreal-type forests of Isle Royale where it forms and important component of moose diet in winter. Suppression increases with increasing canopy cover and forest age. However, response to an individual, severe browsing episode cannot be generalized in terms of suppression. Such shorter-term responses are best investigated by experimentation. Artificial removal of foliage from understory balsam fir showed that damage such as reduced terminal growth and complete mortality was actually highest among least suppressed trees. Canopy cover produced a secondary effect, in which trees experiencing >60% cover were unable to compensate for removal by clipping. Among less suppressed trees, competition for limited light produced an apically oriented morphology that countered the laterally oriented morphology associated with suppression. Over the long term, suppression may be a means by which fir remains alive when subjected to continuous browsing.			
113	Meeker, James	2000	Rational, protocol, and record of establishment for forest vegetation monitoring plots for Outer, Devils, Raspberry and York Islands, Apostle Islands National Lakeshore	APIS
	This study began in spring of 1997 and continued in 1998 and developed a long-term forest monitoring program. Permanent vegetation plots were established for monitoring forest vegetation changes on Apostle Islands National Lakeshore (APIS). Description of old growth and recover plots on Outer, Raspberry and Devils Islands for future comparisons to inland sites were made. Comparisons were made of: old growth plots on Outer Island to other Outer Island plots that were cut over different time frames (1920's to 1950's), recovery rates between logged sites and sites that were both logged and burned on Outer Island, and the old-growth mixed boreal forests of Raspberry and Devils Islands to similar habitat on York Island that was cut just prior to the APIS acquisition (1974).			
114	Michigan Department Of Natural Resources, U.S. Department Of Interior, National Park Service	1989	Memorandum of understanding between the Michigan Dept of Natural Resources and the NPS relating to cultural and natural resources management on and adjacent to Pictured Rocks Natl Lakeshore, Sleeping Bear Natl Lakeshore and Isle Royale Natl Park	PIRO
	This Memorandum of Understanding between the Michigan Department of Natural Resources and Pictured Rocks National Lakeshore, Sleeping Bear Dunes National Lakeshore, and Isle Royale National Park, MI formalizes a spirit of cooperative efforts to protect and/or manage habitats and species in and adjacent to national public lands. Entities identified are wetlands, watersheds, coastal zones, forests, wildlife, research projects, National Natural Landmarks, and endangered species. It is signed by directors and superintendents of the agencies.			
115	Minnesota Department of Natural Resources	no date	Upper St Croix resource management plan	SACN
	The plan describes an approach to preserve, restore, develop, and manage the Minnesota portion of the Upper St. Croix River Valley. Study areas mostly consisted of state-owned lands.			
116	Minnesota Department Of Natural Resources	1989	Forest area plans	SACN
	Plans include resource descriptions, current state activities and goals and recommendations for management of forest areas. Existing plans include Moose Lake Area Plan (Pine, Carlton and Kanabec Counties), l986, and Cambridge Plan (includes Chisago County), 1989. Much information related to wildlife also included.			
117	Minnesota Department Of Natural Resources	1990	Forest inventory programs	SACN
	Ongoing programs to inventory forest resources in Minnesota. Phase I includes monitoring permanent plots in Minnesota in public and private ownership to note trends in land-use and vegetation. Phase II includes a 100 percent inventory of state and county lands to gather data on all cover types. Data gathered on plant diseases, species and volume of plants. Data available at various geographic levels. Endangered species and cultural features are flagged in the inventories.			
118	Minnesota Department Of Natural Resources (Division Of Forestry)	1986	Orr Area Forest resource management plan	VOYA
	Resource Management Plan for the Orr Area Forest which the Minnesota Department of Natural Resources administers. This area is directly adjacent to Voyageurs National Park. This particular document contains only the sections of the Orr Area Management Plan that pertain to issues involving Voyageurs National Park and the cooperative agreement between the two agencies.			

119	Minnesota Department of Natural Resources, Lenarz, Mark S.	1987	1986-87 aerial moose survey results	VOYA
	Aerial surveys for moose were conducted by the Minnesota Department of Natural Resources on three areas in Minnesota during the winter of 1986-87. One of these areas, the Northeast (NE) includes the Superior National Forest which is directly adjacent to lands within Voyageurs National Park. Survey methods followed those of Gasaway et al. (1986). Discussions of the findings are included for each of the three areas surveyed. Numbers of moose, their approximate ages, and sex if possible were recorded during the surveys.			
120	Moen, Ron, Peterson, Rolf;	2003	Effects of moose on fuel load in Isle Royale National Park forests; Western Great Lakes research conference and Chequamegon Bay area natural resource conference: Abstracts	ISRO
	FIRELINK, a gap model derived from LINKAGES, was used to simulate forest cover types on Isle Royale. Predictions were compared to measurements of basal area, stem density, and fuel loading in stands with and without moose browsing. Fuel loads were modeled from the early 1900s to 2050.			
121	Mohler, J. A.	1973	Bald eagle-osprey habitat management	PIRO
	no abstract available			
122	Mudrey, M. G. Jr	1978	Wisconsin's zinc-copper resources	SACN
	no abstract available			
123	Naiman, Robert J., Pinay, Gilles, Johnston, Carol A., Pastor, John	1994	Beaver influences on the long-term biogeochemical characteristics of boreal forest drainage networks; Ecology	VOYA
	Beaver (*Castor canadensis*) affect biogeochemical cycles and the accumulation and distribution of chemical elements over time and space by altering the hydrologic regime. Aerial photograph analyses of beaver activities on the 298-km2 Kabetogama Peninsula, Minnesota, were coupled with site-specific studies of soil and pore water concentrations of nutrients (nitrogen and phosphorous) and other ions (potassium, calcium, magnesium, iron, sulfate, chloride), nitrogen cycling processes (nitrogen fixation and denitrification), and biophysical environmental variables (vegetation, temperature, organic matter, soil structure, pH, and oxidation-reduction potential). Our analyses demonstrated that beaver influence the distribution, standing stocks, and availability of chemical elements by hydrologically induced alteration of biogeochemical pathways and by shifting element storage from forest vegetation to sediment and soils. (excerpt from abstract)			
124	Norum, R.A., Miller, M.	1984	Measuring fuel moisture content in Alaska: standard methods and procedures	VOYA, WRST
	Methods and procedures are given for collecting and processing living and dead plant materials for the purpose of determining their water content. Wildland fuels in Alaska are emphasized, but the methodology is applicable elsewhere. Guides are given for determining the number of samples needed to attain a chosen precision. Detailed procedures are given for collecting fuel samples in the field, transporting them safely, and handling them in the laboratory. General guidelines for all live fuels and specific techniques for individual species are given.			
125	Ohmann, Lewis F., Grigal, David F.	1985	Biomass distribution of unmanaged upland forests in Minnesota; Forest Ecology and Management	VOYA
	A floristic analysis of natural and logged upland forest community-types within the Boundary Waters Canoe Area Wilderness of Minnesota. Data collected for the floristic analysis were applied to biomass estimation equations to produce estimates by species for stands within each community-type.			
126	Old Growth Task Force	1992	Old-growth forest stands in Minnesota – a study report	VOYA
	In the fall of 1990 the Chairman of the Minnesota Society of American Foresters (SAF) appointed a task force to identify and study issues associated with old-growth forests in Minnesota. The task force was charged with addressing the issue of Minnesota's old growth forests becoming seriously endangered. To evaluate the situation, the task force's goals were to develop a generic definition of old-growth, provide some indications of the extent of old-growth forests, develop possible alternatives for sustaining old-growth and make recommendations to the Minnesota Society of American Foresters. "The task force discussed the environmental and socioeconomic values associated with providing old-growth forests in Minnesota including value from an ecology, wildlife, recreation, and timber production perspective. Estimates of the old-growth resources in Minnesota are provided although inventory data at present are partial and limited. "(Excerpts from author's executive summary) Twelve conclusions are presented along with nine recommendations to the Minnesota SAF.			

127	Pastor, John, Dewey, Brad, Moen, Ronald, Mladenoff, David J., White, Mark, Cohen, Yosef	1998	Spatial patterns in the moose-forest-soil ecosystem on Isle Royale, Michigan, USA; Ecological Applications	ISRO
	The effects of herbivores on landscape patterns and ecosystem processes have generally been inferred only from small-plot or exclosure experiments. However, it is important to directly determine the interactions between herbivores and landscape patterns, because herbivores range over large portions of the landscape to meet requirements for food and shelter. In two valleys on Isle Royale, Michigan, soil nitrogen availability and its temperal variance decreased rapidly as consumption of browse by moose (*Alces alces*) increased; with greater amounts of consumption, nitrogen availability was uniformly low and constant from year to year. The authors tested three geostatistical models of the spatial distribution of available browse, annual browse consumption, conifer basal area, and soil nitrogen availability across the landscape.			
128	Pastor, J., Mladenoff, D.J.; Shugart, H.H., Leemans, Rik, Bonan, G.B., Editors	1992	8: The southern boreal - northern hardwood forest border; A Systems Analysis of the Global Boreal Forest	APIS, GRPO, ISRO, PIRO, SACN, SLBE, VOYA
	In this chapter we will examine the nature of the southern boreal forest, explicitly it transition with the cool temperate deciduous forest that occurs to its south. Although we will describe this zone in other regions, we will concentrate on the North American expression of it.			
129	Pastor, John, Naiman, Robert J.	1992	Selective foraging and ecosystem processes in boreal forests; The American Naturalist	ISRO
	The authors suggest that selective foraging alters feedbacks between plants and decomposers and between plants and herbivores. Plant tissue chemistry is an important link between herbivores and decomposers. Plants that produce easily decomposable litter are also heavily browsed, because the same chemical properties that determine litter decay also determine digestibility. This trait links theories of food webs and nutrient cycles by posing a role of herbivores as functional switches determining both plant and community composition and the array of litters returned to the soil. This role appears to be particularly strong in boreal forests, where nutrient availability is low, where effects of herbivores are strong and long lasting, and where the same plant traits that determine herbivore preference and response to browsing also determine interactions with soil nutrient availability. Such feedbacks cause the effects of herbivores on ecosystems to persist even after the herbivores are no longer present. This paper uses foraging by moose and beaver as examples.			
130	Payette, S.; Shugart, Herman H., Leemans, Rik, Bonan, Gordon B., editors	1992	Fire as a controlling process in the North American boreal forest (Chapter 5); A systems analysis of the global boreal forest	APIS, GRPO, ISRO, PIRO, VOYA
	Major patterns of plant communities and species distribution are induced by various disturbance regimes operating at different spatial and temporal scales. fire disturbance in the boreal forest creates all sizes of canopy gap, and constitutes one of the most important community processes in vegetation development along complex environmental gradients. At the landscape level, ecological disturbances result in the spatiotemporal development of the vegetation mosaic composed of an assemblage of stand patches of different age, areal extent, and floristic composition.			
131	Pitt, David G., Whited, Diane C., Hanson, Michele	2001	Chapter 3: Geomorphic changes in the St. Croix River islands from 1969 to 1991; St. Croix River shoreline studies: 1995-2000	SACN
	Changes in forest structure were used to determine the long-term trends in St. Croix River island geomorphology in the study area from north of the Boomsite in Stillwater, MN to the Soo Line Swing-bridge. Forested cover on the islands was mapped using ArcInfo for 1969 and 1991. The two layers were then stratified, and the changes in forest cover were calculated.			
132	Potzger, J. E.	1932	Succession of forests as indicated by fossil pollen from a northern Michigan bog; Science	ISRO
	no abstract available			
133	Potzger, J. E., Wilson, I. T.	1941	Post-pleistocene forest migration as indicated by sediments from three deep inland lakes; American Midland Naturalist	ISRO
	no abstract available			

134	Rakestraw, Lawrence, Frederick, Douglas J., Eder, C.R., Van Dyke, R.A., Griewe, B.J.	1976	Original forest vegetation and land use history of the Apostle Islands National Lakeshore; proceedings of the first conference for scientific research in the national parks; Apostle Islands National Lakeshore Research Reports	APIS
	A brief history of post-settlement human disturbance to the forests of the Apostle Islands is presented and discussed.			
135	Read, Robert H.	1974	Vascular plants of Pictured Rocks National Lakeshore (with identification of botanically outstanding areas in park)	PIRO
	Names of 569 species of vascular plants of Pictured Rocks National Lakeshore, MI are catalogued alphabetically by family name with brief notes on habitat for each. A separate, alphabetical list of common names of plants provides a reference for the scientific names. The introduction addresses major and noteworthy minor vegetation types of Pictured Rocks National Lakeshore and provides tables which list representative species of deciduous woods, pine woods and barrens, wet woods, and beach strand and dunes. The significance of disjunct western plant species, boreal species, and beach species is discussed.			
136	Reich, Peter, B., Hubachek, F.B., Jordan, Peter, Frelich, Lee E.	no date	Forest succession and herbivore interactions in the western Great Lakes Parks	PIRO
	The report proposes a study that examines the effects of soil, climate, and herbivory of large mammals on the vegetation of the western Great Lakes Parks.			
137	Renkin, R.A., Despain, D.G.	1992	Fuel moisture, forest type, and lightning-caused fire in Yellowstone National Park; Canadian Journal of Forest Research	VOYA
	The occurrence and behavior of lightning-caused fires in Yellowstone National Park were summarized for 17 years (1972-1988) during a prescribed natural fire program. Both ignition (occurrence) and spread (stand replacing fire activity) of fires were strongly influenced by fuel moisture and forest cover type.			
138	Rogers, Robert	1979	Understory communities in old-growth mesic forests of the northwestern Great Lakes region	APIS
	Vegetation was sampled semi-quantitatively, by layer, in a stand of old-growth hemlock dominated forest on Outer Island. The stand, is on a poorly-drained flat similar to Superior Lowland sites supporting hemlock on the mainland, pits and mounds, 1 to 3 m in diameter, are abundant. Surface soil in both pits and mounds is fibrous to woody peat, usually thicker than 50 cm. The principal environmental difference between the pits and mounds was the degree of inundation. The overstory is strongly dominated by hemlock though yellow birch and cedar are common in the smaller size classes. The canopy of the overstory is open, perhaps a result of frequent windthrow (a likely hypothesis given the abundance of rotting wood on the forest floor). Several white pine were seen at the edge of the stand, suggesting that the site might have once generally supported white pine, which was logged. In the understory I was able to identify 24 species of vascular plants. Hemlock was the most abundant tree in the understory. Perhaps unique remnant of a yew-dominated shrub layer that was probably prevalent on flats in the region before invasion and expansion of the post-logging deer herd.			
139	Rowe, S.J., Scotter, G.W.	1973	Fire in the boreal forest; Quaternary Research	APIS, GRPO, ISRO, PIRO, SLBE, VOYA
	The boreal forest in North America owes much of its floral and faunal diversity to periodic fires ignited by lightning and by man since he appeared on the scene. The indirect evidences of burning in vegetation and soils, and recent direct observation of fires, are reviewed. Fire is shown to exert a significant effect on vegetation composition, on soil chemical properties and thermal regime, and on animal populations through the particular habitat of created. In turn, fire is itself influenced by the nature of geographic landscape ecosystems according to their surface forms, accumulations of organic materials, and susceptibility to drought. It is concluded that fire should be viewed as a normal ecological process in the boreal forest. A thorough understanding of its long-term role in terrestrial and aquatic ecosystems is needed.			
140	Rutkowski, Darcy, Hanson, David G. Jr., Stottlemyer, Robert	1986	Biomass, nutrient budgets, and biogeochemistry of boreal ecosystems, Isle Royale National Park; Abstracts of Conference on Science in the National Parks, Colorado State University, Fort Collins, CO, July 13-18, 1986	ISRO
	no abstract available			

141	Rutkowski, Darcy, Stottlemyer, Robert	1986	Biomass, nutrient budgets, and biogeochemistry of boreal and northern hardwood ecosystems, Isle Royale National Park and Michigan's Huron Mountains; IN: Conference on Northern Hardwood Resources: Management and Potential, August 18-21, 1986, Michigan Technological University, Houghton, MI	ISRO
	no abstract available			
142	Rutkowski, Darcy, Stottlemyer, Robert	1992	Composition, biomass and nutrient distribution in mature northern hardwood and boreal forests of Upper Michigan Research Report #49 submitted to Dr R Herrmann, Program Director, Watershed Research, NPS	ISRO
	no abstract available			
143	Sand, Margaret	1995	Metro region forest resource management plan: final report	MISS
	The forest management plan provides an overall inventory of the forest resources in the metro region, discusses issues affecting forest health, and outlines strategies to preserve or restore forest cover. Three major habitat types are analyzed: Anoka Sand Plain, Big Woods, and Oak Savanna. Maps and tables explore public lands, stream and river corridors, forest cover and management practices in each of these areas.			
144	Schimmel, Johnny, Granstrom, Anders	1996	Fire severity and vegetation response in the boreal Swedish forest; Ecology	APIS, GRPO, ISRO, PIRO, VOYA
	We studied plant survival and colonization over an experimental gradient, from fire lightly scorching the soil to fire consuming most of the organic soil layer, at two forest sites in northern Sweden. The gradient was achieved by adding different amounts of fuel to small plots that were burned in 1988 and 1989. Temperature was recorded at four soil strata during burning. We analyzed survival of seeds and rhizomes in the soil immediately after fire, and followed vegetation cover and seedling establishment until 1993. The results indicate that in boreal forest, depth of burn is a more important variable than fire front intensity for the understory vegetation, in contrast to the situation in ecosystems with little accumulation of organic matter on the mineral floor.			
145	Schmit, J.P., Murphy, J.F., Mueller, G.M.	1996	Diversity and abundance of macromycetes in Cowles Bog, Indiana Dunes; 23rd natural areas, 15th North American prairie, and Indiana Dunes ecosystems conferences: Abstracts	INDU
	Two permanent plots were established in an oak-dominated forest near Cowles Bog in Indiana Dunes National Lakeshore to monitor macromycetes. Sporocarps were collected weekly during the fruiting season and were identified and measured for abundance.			
146	Schultz, J.R.	1981	Silviculture prescription, stand number two, Namekagon River tract, Hayward Ranger District, Chequamegon National Forest	SACN
	Provides a detailed forest management plan for a tact of timber located near the headwaters of the Namekagon River			
147	Schuster, Rudolph M.	1953	Boreal *Hepaticae* – a manual of the liverworts of Minnesota and adjacent regions; American Midland Naturalist	ISRO
	no abstract available			
148	Shiras, George, III	1936	Hunting wildlife with camera and flashlight	PIRO
	950 photographs and narrative text describe the Upper Peninsula of Michigan, northern Minnesota, and the Wanipitei District of Ontario during the last decade and a half of the 19th century and the early part of the 20th century. Particular emphasis is given to the first nighttime photographs of wild animals, using a wire-tripped shutter apparatus. Among those featured are white-tailed deer, muskrat, beaver, albino porcupine, timber wolf, elk, moose, snowshoe rabbit, cottontail rabbit, black bear, striped ground squirrel, mink, skunk, weasel, lynx, wildcat, raccoon, cedar waxwing, and white-banded blue butterfly. Many of the photographs were taken on the Grand Island Game Preserve (Grand Island, Alger County, MI) and at Laughing Whitefish Lake in Alger County, MI. One chapter is devoted to various fungi. There are anecdotes of wilderness guides and a few photographs of Ojibwa individuals and families. Several photographs capture the cliffs of what is now Pictured Rocks National Lakeshore, MI. One is taken of Chapel Rock before a portion of the exposed rock broke apart, creating the present appearance of a pedestal.			
149	Slaughter, K.W., Grigal, D.F., Ohmann, L.F.	1997	Carbon storage in southern boreal forests following fire	APIS, GRPO, ISRO, PIRO, VOYA
	We measured changes in carbon (C) after fire in 7 southern boreal upland forest stands during the 5 immediate post-fires years and 23 years after the fire. Dynamics of C differed among the stands. Data from either a single stands or a chronosequence in space rather than in time can lead to different conclusions than those from multiple stands through time.			

150	Stottlemyer, Robert	1982	The modification of incident precipitation by northern hardwood and boreal forest canopies: GLARSU Technical Report #5 submitted to Chief Scientist, Midwest Region, National Park Service, Omaha, NE	ISRO
	no abstract available			
151	Stottlemyer, Robert	1993	Blowdown as a mortality factor in mature boreal forests, Isle Royale National Park, Michigan; Canadian Journal of Forest Research	ISRO
	no abstract available			
152	Stottlemyer, Robert	1994	Effect of climate change on C:N pools in a boreal watershed ecosystem; Proc Inter Boreal Forest Res Assoc (Abstract); September 25-28, 1994, Saskatoon, Saskatchewan, Canada	ISRO
	no abstract available			
153	Stottlemyer, Robert R., Cole, Kenneth L.	1986	Effects of fires on temperate forests: North Central United States - a research proposal	VOYA
	A research proposal to study the specific effects of fire on various community types in the Great Lakes Region including study sites within Voyageurs National Park. The objectives of the study are to determine the origin and ecological history of the mature pre-settlement forests in the specific park units and relate their present status to the primeval situation (2) characterize regional change which has occurred since settlement, and assess the relative contributions to these changes resulting from climate, fire, insects and disease, changes in land use, large herbivores, and change in airborne contaminant levels (3) determine patterns of change which have occurred in specific national parks, and (4) Develop both short- and long-term strategies for maintaining or restoring natural forest ecosystems in these national parks.			
154	Stottlemyer, Robert R., Cole, Kenneth L.	1987	Effects of fires on temperate forests: North Central United States - FY 1986 progress report	VOYA
	This is a progress report for research being conducted on the effects of fires on the temperate forests of north central United States. Six National Park units in the Great Lakes area are included in this study with Voyageurs National Park being one of them. The objectives of the study are to determine the origin and ecological history of the mature pre-settlement forests in the specific park units and relate their present status to the primeval situation (2) characterize regional change which has occurred since settlement, and assess the relative contributions to these changes resulting from climate, fire, insects and disease, changes in land use, large herbivores, and change in airborne contaminant levels (3) determine patterns of change which have occurred in specific national parks, and (4) develop both short- and long-term strategies for maintaining or restoring natural forest ecosystems in these national parks.			
155	Stottlemyer, Robert, Dlutkowski, Susan, Toczydlowski, David	1994	Blowdown as a mortality factor in a mature boreal forest (Research Report #59) Submitted to Dr Raymond Herrman, Program Manager, Ecosystem Studies, National Biological Survey, Colorado State University, Fort Collins, CO	ISRO
	no abstract available			
156	Stottlemyer, Robert, Dlutkowski, Susan, Toczydlowski, David	1995	Blowdown as a mortality factor in mature boreal forests, Isle Royale National Park, Michigan; American Midland Naturalist	ISRO
	no abstract available			
157	Stottlemyer, Robert, Toczydlowski, David	1999	Seasonal relationships between precipitation, forest floor, and stream water nitrogen, Isle Royale, Michigan; Soil Sci. Soc. Am. J.	ISRO
	This paper summarizes a 5-year study of seasonal N content and flux in precipitation, snow pack, forest floor, and stream water in order to assess the source of inorganic N outputs in stream flow from a small boreal watershed. Average precipitation N input was 3 kg ha-1 yr-1. The forest floor inorganic N pool was ~ 2 kg ha-1, eight times larger than monthly precipitation input. The inorganic N pool size peaked in spring and early summer. Net N mineralization rates peaked in early summer. During the winter, the mean and monthly net N mineralization rate was twice the peak snow pack N content. Stream water NO3 concentrations peaked in winter, and inorganic N output peaked in late fall. The relatively small snow pack N content and seasonal precipitation N input compared to inorganic N pools and net N mineralization rates, the strong ecosystem retention of precipitation N inputs, and the seasonal stream water NO3 concentration and output pattern all indicated that little stream water NO3 came directly from precipitation or snowmelt.			

158	Stottlemyer, Robert, Toczydlowski, David	2000	Long-term study of boreal watershed/lake ecosystems, Michigan; Fraser Experimental Forest, CO; and Alaska	ISRO
	This report summarizes research completed during FY99, and outlines research objectives and a study plan for FY2000. The study sites considered in this research report are the Wallace Lake Watershed, Isle Royale National Park (ISRO), Michigan; the Calumet Watershed, Michigan's Upper Peninsula; watersheds of the U.S. Forest Service Fraser Experimental Forest, Colorado; and the tree line Asik Watershed, Noatak National Preserve, Alaska. The sites are predominately boreal ecosystems. All are major ecotones (northern hardwoods-boreal, subalpine-alpine, taiga-tundra). While the research objectives differ somewhat among sites, the conceptual approach is similar. Much of the work is common among sites, or is planned to be such. The research emphasis has been and continues to be on terrestrial processes. An assessment of the literature suggests for terrestrial ecosystems that the study of processes in an ecosystem context likely will give the earliest statistical indication of incipient change due to stress, and a better quantification of the magnitude of response.			
159	Stottlemyer, Robert, Toczydlowski, David, Herrmann, Raymond	1998	Biogeochemistry of a mature boreal ecosystem: Isle Royale National Park, Michigan	ISRO
	During 1982-96, a study was conducted of the biogeochemistry of the mature boreal forested Wallace Lake watershed in Isle Royale National Park, Lake Superior basin, Michigan. The research objectives were the quantification of the ecosystem structure and function and the determination of the response of the watershed to atmospheric inputs and climate change. Since 1982, precipitation H+ and SO4 concentrations declined. Throughfall H+ and NO3 flux were less than precipitation input, but SO4 increased. Base cation (CB), HCO3, and SO4 flux were greater in soil water than in throughfall, but H+, NH4, and NO3 were less in soil water than in throughfall. Watershed CB output exceeded input 1.7 times. The watershed retained more than 99% of H+ inputs and 75% of NO3 and NH4 inputs. SO4 output was 1.2 times greater than SO4 input. The net change in total aboveground biomass with time was small.			
160	Stottlemyer, Robert, Travis, Benjamin, Toczydlowski, David	1995	Nitrogen mineralization in boreal forest stands of Isle Royale, Northern Michigan; Water, Air and Soil Pollution	ISRO
	The correlation of soil temperature and moisture with inorganic nitrogen concentrations and net mineralization beneath major species types in mature boreal and northern hardwood forests was examined over a two year period.			
161	Swain, Albert M.	1981	Final report to National Park Service on forest and disturbance history of the Apostle Islands	APIS
	The Apostle Islands National Lakeshore and adjacent areas in Bayfield County provide contrasting environmental settings for studying the history of forest vegetation. The most significant results of the forest history described in this report include: 1. The records of pollen and charcoal on Stockton Island show distinct differences in forest composition between sites with different soils during the past 6000-7000 years; 2. Tree-ring analysis of increment borings and fire-scarred cross sections showed that fires were relatively frequent on the tombolo (as least 9 fires during the past 250 years) while the frequency north of the tombolo ranged from 0 to about 3 fires during the same interval; 3. The climatic differences between inland areas of the Bayfield peninsula and the islands are reflected in the pollen results from Long Lake and Brander Bog respectively; 4. The effects of logging are evident on all of the pollen diagrams from the islands and the mainland; and 5. The increase of spruce pollen at all pollen sites during the past 2000-3000 years suggests somewhat cooler climatic conditions than for previous millennia.			
162	Thompson, Paul W.	1967	Vegetation and common plants of Sleeping Bear	SLBE
	Discusses and describes the common plants and vegetational communities found in Sleeping Bear Dunes National Lakeshore, Michigan. There are lists of plants found in the following vegetational communities: sand dunes, pine plains, beech-maple hardwood forests, quaking bog, black spruce bog, sedge meadows, aquatic communities, meadows, wetland swales, and white cedar forests. The appendix has a listing of where to find representative plant communities and a list of champion trees within Sleeping Bear Dunes National Lakeshore.			
163	Toczydlowski, David, Rutkowski, Darcy, Stottlemyer, Robert	1990	Sulfur budget in a mature boreal forested watershed, Isle Royale National Park, MI; Ecological Bulletin	ISRO
	no abstract available			
164	Toczydlowski, David, Stottlemyer, Robert, Dlutkowski, Susan	1993	Blowdown as a mortality factor in a mature boreal forest; Bulletin of the Ecological Society of America	ISRO
	no abstract available			

165	Tyrrell, Lucy	1991	Old-growth forests on National Park Service lands: NPS views and information	VOYA
	"An informal survey was initiated to determine what information is now available on the extent, character, and management of old-growth forests on lands of the National Park Service (NPS). In 1988. a questionnaire was distributed to NPS units that possibly contained the community type. The responses of all 58 units have been summarized and are presented here." (excerpts from author's abstract) Voyageurs data is included.			
166	Tyrrell, Lucy E.	1991	Patterns of coarse woody debris in old growth hemlock-hardwood forests of Northern Wisconsin and Western Upper Michigan	APIS
	Patterns of coarse woody debris (CWD) and associated features of tip-up mounds and canopy gaps were investigated in 25 old-growth hemlock-hardwood forests in northern Wisconsin and adjacent Michigan in relation to stand age, site characteristics, and landscape context. CWD was highly influenced by stand age. Stands with well-developed "old-growthness" have most of the following characteristics (1) maximum tree age 275-300 yr, (2) good age-diameter relationship, (3) low, flat diameter distribution of live trees, (4) trees >70 cm, (5) dead wood >120-150 m3/ha with logs >80 m3/ha, and (6) hemlock logs present in all classes of decay. Stands with richer soils show a weak trend toward greater amounts of CWD. Stands with moister soils have a greater density and area of recent mounds. Based on a recensus of permanent plots in 15 hemlock stands, mortality rates for all species ranged from 0.2% to 1.6% of original basal area per yr, or from 2.0 to 8.4 trees per ha per yr. As documented by permanent plots, and a comparison of log origins versus gap-maker origins, time periods of at least 5 years increase the probability that stands experience a disturbance event.			
167	Tyrrell, Lucy E.	1991	Old growth forests on National Park Service lands: NPS views and information; Great Lakes CPSU Reports	APIS
	An informal survey was initiated to determine what information is now available on the extent, character and management of old-growth forests on lands of the National Park Service (NPS). In 1988 a questionnaire was distributed to NPS units that possibly contained this community type. The responses of all 58 units have been summarized. The working definitions of old-growth differed widely among respondents. Attributes most frequently mentioned were lack of disturbance and tree age. The amount of old-growth is estimated at more than 1.97 million hectares, located in 32 states and the District of Columbia, and in all 10 NPS regions. Species lists for old-growth stands are available for vascular plants in 53% of the NPS units and for birds in 35%. The most frequently reported disturbances affecting old-growth forests were logging, wildfire, windthrow events and fire suppression. More than half of NPS units reported no management plan specific to old-growth forests. The old-growth forests on lands of the NPS are an extensive and valuable natural resource whose importance should be considered in plans for park management and research.			
168	U.S. Forest Service	1976	Wildlife habitat on the National Forests in Wisconsin	SACN
	This report provides an overview and status of the wildlife habitats found within the state's two Federal Forests. It outlines the human demands on the resources, explains management techniques and goals, gives details on status animals found, and includes information on water resources and wetlands. There is a discussion of the creation of a habitat management plan. Photographs and charts of raw data are included for both habitat types and species. Also, various cost estimates for segments of the plan are included.			
169	U.S. Forest Service	1995	Landscape ecology project	SACN
	Long-term study to better understand the role that major landscape features (such as river corridors) play in maintaining and enhancing biological diversity; and how landscape patterns, forest management and land-use practices affect biology in the river corridor; particular concentration on forest fragmentation and variation across the watershed and its impact on natural populations. Current study includes migratory and nonmigratory birds and impact of forest fragmentation. Future plans to study other animal populations such as turtles and mammals. Interim findings will be used to develop management decisions and policy recommendations.			
170	U.S. Forest Service	2000	Forest inventory and analysis national core field guide, vol II: field data collection procedures for phase 3 plots - ozone measurements and sampling; Forest Inventory and Analysis	ISRO, PIRO
	This document describes the standards, codes, methods, and definitions for Forest Inventory and Analysis (FIA) field data items. The objective is to describe CORE FIA field procedures that will be consistent and uniform across all FIA units. Volume II of the series describes an additional expanded suite of data collected on the Phase III subsample. Volume II will consist of the FHM field manual, minus data elements already collected on the FIA sample.			

171	U.S. Forest Service North Central Area	2000	Forest inventory and analysis national core field guide modified for north central FIA unit, vol 1: field data collection procedures for phase 2 plots; Forest Health Monitoring	ISRO, PIRO
	This document describes the standards, codes, methods, and definitions for Forest Inventory and Analysis (FIA) field data items. The objective is to describe CORE FIA field procedures that will be consistent and uniform across all FIA units. Volume I focuses on data collected in the field on all Phase 2 plots in the FIA sample and on mensuration add-ons collected on Phase-3 plots.			
172	Voyageurs National Park, Gogan, Peter J.P.	no date	Old-growth forests in the National Parks questionnaire	VOYA
	Questionnaire completed as part of a project by the Botany Department of the University of Wisconsin. Questionnaire presents information on the location, type, acreage, and approximate ages of old-growth forest areas within the Park.			
173	Waldo, P.	1978	Stop 2; Ned Brown Forest Preserve	INDU
	no abstract available			
174	Waterman, Warren, G.	1917	Ecology of Northern Michigan dunes: Crystal Lake bar region; Michigan Academy of Science, annual report	SLBE
	A description of the physical characteristics of the Crystal Lake Bar Region, Michigan. The geologic history concerning glacial deposits, Nipissing formations, and dune formations of the area are discussed. The environmental factors (climate and substratum) that affect the plant communities are discussed. There are descriptions of the plant communities of the area: climax forest, dune vegetation, blow out vegetation, and Crystal Lake Beach. The author presents three problems for future research: the character and cause of the border zone formation; distribution of *Pinus strobus* ; and, the relations of the component parts of the climax forest. There are maps showing the geology of the Crystal Lake Bar region. There are photographs showing examples of the plant communities described.			
175	Waterman, Warren, G.	1926	Ecology of Glen Lake and Sleeping Bear Dunes Region; papers of the Michigan Academy of Science	SLBE
	A description of the physical characteristics of the Glen Lake and Sleeping Bear Dunes Region. The geological history of the region is discussed. There are descriptions of the plant communities in the Glen Lake Region (upland forests and sand-ridge region) and the Sleeping Bear Dune Region (moving sand areas, fixed dunes, and gravely plains). Successional trends in this area are discussed: the Glen Lake region, the morainic plateau, perched dunes, and the northern plain. There are maps showing the land forms of the area.			
176	Wehrman, Chapman	1979	Anoka Mississippi River critical area plan	MISS
	The report discusses the designation of the Mississippi River from Ramsey to Ravanna, MN as a Critical Area (prior to the creation of the Mississippi National River and Recreation Area) and how it will affect land use in the Champlin, Ramsey, and Anoka areas. The environmental features of the area are described, and suggestions for future inventories and management are made.			
177	Wein, R.W., MacLean, D.A., editors	1983	The role of fire in northern circumpolar ecosystems	VOYA
	Fire in the forest came to be viewed in a new perspective during the decades of the 1960s and 1970s. Instead of being regarded as an unmitigated threat to be suppressed whenever practicable, it was seen increasingly as an integral part of ecological processes. Accordingly, it claimed attention as a tool of environmental management and as an object of new research. This volume, focused on the great belt of tundra and northern and central boreal forests encircling the northern hemisphere, examines these ecosystems in a pioneering fashion.			
178	White, Mark A., Host, George E.	2003	Historic disturbance regimes and natural variability of Grand Portage National Monument forest ecosystems	GRPO
	Summary of field investigation for fire scars and old trees within GRPO, coupled with new interpretation of historic fire regimes for the North Shore (of Lake Superior). Probable disturbance factors and history are presented, along with suggestions for management actions to return portions of the trail corridor to pre-settlement conditions. Significant old growth areas are described.			
179	Whitford, Harry Nichols	1901	The genetic development of the forests of Northern Michigan; a study in physiographic ecology; The Botanical Gazette	SLBE
	The author studies the correlation between geology and climax forests in four sets of "physiographic formations" (combination of climate, ecology, and geological history factors) in northern Michigan. The "physiographic formations" are: the Sand Societies (North Manitou Island and Beaver Island); the Clay Societies (shores of Lake Michigan), the Rock Societies (pre-Cambrian rocks of Marquette), and the Swamp Societies (depressions made by glaciers and lagoons cut off from larger lakes). There are photographs (photocopies in this copy) showing examples of different physiographic formations.			

180	William, J.T., Rothermel, R.C.	1992	Fire dynamics in northern Rocky Mountain stand types	VOYA
	In the Northern Rocky Mountains, fire growth and potential fire severity develop differently according to the type of vegetation. Grass, brush, and timber-dominated types respond to fire based on their unique physical characteristics and the sites they occupy. The fire dynamics of these three types are described, using examples, and their management implications are discussed.			
181	Wisconsin Department Of Natural Resources	1975	Preliminary environmental report for the proposed acquisition, development and management of the St Croix River State Forest, Burnett and Polk Counties, Wisconsin	SACN
	Description of the existing environmental conditions in the state forest area, background, socioeconomic conditions of the area, and physical environment. Describes proposed actions for acquisition and development and estimation of impacts. Describes alternative actions. Includes data, bibliography and species lists for the area.			
182	Wisconsin Department Of Natural Resources	1977	Impact upon local property taxes of acquisitions within St Croix River State Forest in Burnett and Polk Counties	SACN
	Describes land acquisition activities by the National Park Service and Wisconsin DNR for the St. Croix River State Forest and the impacts of acquisition on local tax rates. Describes effects on local taxes as well as interactions with federal taxes.			
183	Wisconsin Department Of Natural Resources	1988	Governor Knowles state forest master plan	SACN
	Includes background data on history, administration, management, resources, management problems, and recreation needs of the state forest area. Describes recommended management and development programs for recreation, wildlife, fish, forest, and land acquisition. Analyzes alternatives. Appendices include data, inventories and maps. Includes Kohler-Peet Wildlife Area and St. Croix Barrens Sharptail Area.			
184	Wright, H. E., Jr.	1964	Aspects of the early post-glacial forests and succession in the Great Lakes region; Ecology	ISRO
	no abstract			
185	Yin, Yao, Nelson, John C.	1995	Modifications to the Upper Mississippi River and their effects on floodplain forests	MISS
	A discussion of the floodplain forest ecosystem is followed by an examination of the upper Mississippi River from its natural state to the present. The presettlement forest contrasts with the present floodplain system, both in the open river and impounded reaches. Finally, the paper looks at the diminishing floodplain forests, the regeneration of pioneer forests, and possible future approaches.			

FUNGI				
1	Kauffman, C. H.	1918	The Agaricacea of Michigan. Volume I: Text. Volume II: Plates. Michigan geological and biological survey publication 26, biological series 5, published as a part of the annual report of the board of Geological and Biological Survey for 1918	ISRO
	Describes agaric flora collected at Washington Harbor at Isle Royale in 1906.			
2	Povah, Alfred H.W.	1932	New fungi from Isle Royale; Mycologia	ISRO
	Describes seven fungi collected during the summer of 1930 that were previously undescribed: *Patella michiganesis sp. nov., Erinella borealis sp. nov., Schlerostilbum gen. nov., Schlerostilbum septentrionale sp. nov.,* and *Septoria calypsonis sp. nov..*			
3	Povah, Alfred H.W.	1934	The fungi of Isle Royale, Lake Superior; papers of the Michigan Academy of Science, Arts, and Letters	ISRO
	Results of the mycological work conducted in 1930 for the Isle Royale Survey undertaken by the University of Michigan for the State of Michigan. A total of 525 species of fungi were identified; a number of them are described as western species. Contains an annotated list of the fungi of Isle Royale.			
4	Richter, Dana	1985	Investigations of mycorrhizal associations of pine species on the Kingston Plains; Lake Superior biological conference program and abstracts	PIRO
	no abstract available			
5	Schmit, J.P., Murphy, J.F., Mueller, G.M.	1996	Diversity and abundance of macromycetes in Cowles Bog, Indiana Dunes; 23rd natural areas, 15th North American prairie, and Indiana Dunes ecosystems conferences - abstracts	INDU
	Two permanent plots were established in an oak-dominated forest near Cowles Bog in Indiana Dunes National Lakeshore to monitor macromycetes. Sporocarps were collected weekly during the fruiting season and were identified and measured for abundance.			
6	Weber, Nancy S.	1989	Species list of mushrooms of Sleeping Bear Dunes, through 1989	SLBE
	Lists the mushrooms and slime molds found in Sleeping Bear Dunes National Lakeshore, Michigan. Species are listed by Division, Subdivision, Class, Order, and Family.			
7	Whistler, Robert C.	1994	Fungi observation cards (1993, 1994) and attached memos	VOYA
	In 1993 and 1994 Robert Whistler conducted fungi surveys in Voyageurs National Park. He completed observation cards (Form 10-257) based on his observations recorded in his written log.			
8	Wohlrab, Gisela, Tuveson, R.W., Olmsted, C.E.	1963	Fungal populations form early stages of succession in Indiana Dune Sand; Ecology	INDU
	This paper presents evidence suggesting that significant differences exist in the composition of the fungal flora of two adjacent *Ammophila* and *Andropogon* communities which represent two early stages in the dune succession characteristic of the southern shore of Lake Michigan. Fungal species were identified at two study plots at the Indiana Dunes State Park (which is surrounded by the Indiana Dunes National Lakeshore), and their distribution within the areas was correlated with successional patterns.			

GEOLOGY

1	Adamson, Kent Fred	1997	Petrology, stratigraphy and sedimentation of the middle Proterozoic Bayfield Group, Northwestern Wisconsin	APIS
	The Bayfield Group (Middle Proterozoic, Lake Superior region) is composed of three formations which are, from oldest to youngest, the feldspatholithic to lithofeldspathic Orienta Formation; the quartz-arenitic Devils Island Sandstone; and the feldspatholithic Chequamegon Formation. The large amounts of quartz and appreciable feldspar in the formations suggest that the primary provenance was older Early Proterozoic and Archean rocks. Diagenetic action on the Bayfield Group is evidenced by authigenic quartz, hematite, kalinite, zeolite, and minor amounts of potassium feldspar. "Normal" zircon is the most prevalent form found within the non-opaque, non-micaceous suite, this suggests that a potential provenance was Keweenawan volcanics; some residence time in previously deposited rift sediments may have occurred. The minor amount of other zircon varieties support the framework grain analyses that older Early Proterozoic and Archean sources were shedding major amounts of sediment into the depositional basin. The Bayfield Group was deposited in a trangressive-regressive lacustrin to fluvial environment in the waning stages of the Midcontinent Rift System.			
2	Adner, Scott, Walker, James	1996	1996 investigators annual report: internal structures in the lava of Raspberry Island, Isle Royale National Park	ISRO
	The objective of this study is to understand internal volcanic features found in the lava of Raspberry Island and their relationship to each other. This can help understand the emplacement conditions of flood basalts, and differential processes that produced these features. Findings during the first season of field research are presented.			
3	Allen, R. C., Martin, H. M.	1922	A brief history of the geological and biological survey of Michigan: 1837-1872; Michigan History	ISRO
	No Abstract			
4	Anonymous	1987	Paleozoic bedrock of the Twin Cities area	SACN
	Describes Twin Cities geology, concentrating on the Paleozoic strata of the area.			
5	author unknown	1962	Locations of copper, greenstone and thompsonite	ISRO
	This is a copy of the 1962 Topographic Base Map of Isle Royale National Park. A handwritten legend shows the title "Underwater Deposits-Vierthaler" and the map shows locations for deposits of copper, greenstone, thompsonite, and carnelian agates on Isle Royale.			
6	author unknown	1981	Aerial gamma ray and magnetic survey, Manitowoc and Traverse City quadrangles, Wisconsin and Michigan; final report	SLBE
	no abstract			
7	author unknown	1981	St Croix County; Wisconsin cartographic catalog, 1981	SACN
	No Abstract			
8	Author Unknown	1981	East-central Minnesota; geologic map of Minnesota	SACN
	No Abstract			
9	Author Unknown	1984	Dunn County; Wisconsin cartographic catalog 1984	SACN
	No Abstract			
10	Author Unknown	1981	Airborne gamma-ray spectrometer and magnetometer survey, Duluth Quadrangle, Minnesota, Wisconsin; final report	SACN
	No Abstract			
11	Author Unknown	1978	Thornton Quarry and reef and Indiana Dunes	INDU
	No Abstract			
12	Author Unknown	1967	Indiana Dunes National Lakeshore project	INDU
	No Abstract			
13	Author Unknown	1976	Illinois portion; guidebook for a field trip on Silurian reefs, interreef facies, and faunal zones of northern Indiana and northeastern Illinois	INDU
	No Abstract			

14	Author Unknown	1980	Thomsonite Mine to reopen; collecting at a popular location in Minnesota; Gems Miner	VOYA
	No Abstract			
15	Author Unknown	1972	Sleeping Bear Dunes National Lakeshore, Michigan	SLBE
	No Abstract			
16	Author Unknown	1980	Aerial gamma ray and magnetic survey, Chicago Quadrangle, Indiana, Illinois, and Michigan; final report	INDU
	No Abstract			
17	Bagdadi, Khaled Ali	1981	Tectonic studies of the Midcontinent gravity high in East-central Minnesota and western Wisconsin; Part I, Gravity field and crustal structure; Part II, Application of phase transition models to the Precambrian vertical motion history	SACN
	No Abstract			
18	Bajc, A. F.	1987	Quaternary geology of the Fort Frances area	VOYA, GRPO
	No Abstract			
19	Bajc, A. F.	1991	Quaternary geology, Fort Frances-Rainy River area; Ontario Geological Survey Open file report	VOYA, GRPO
	No Abstract			
20	Baker, R. W, Diehl, J. F., Beske, Diehl S., Simpson, T. W., Zelazny, L. W.	1982	Paleomagnetic and pedogenic reexamination of the "Rockian Substage" in western Wisconsin	SACN
	No Abstract			
21	Baker, R. W, Simpson, T. W.	1981	Pre-Woodfordian glaciation in West-Central Wisconsin	SACN
	No Abstract			
22	Balaban, N. H, McSwiggen, P. L., Kanivetsky, R., Palen, B., Olsen, B. M., Meyer, G. N., Isaacs, P., Aronow, S., Hobbs, H. C.	1982	Geologic atlas, Scott County, Minnesota; County Atlas Series Minnesota Geological Survey C 1	MISS
	No Abstract			
23	Bau, A. F. S.	1977	The dip of Quetico Fault; a symmetry argument	VOYA
	No Abstract			
24	Bauer, Robert L.	1979	Structural studies in the Norwegian Bay Block of the Vermilion granitic complex, northern Minnesota	VOYA
	No Abstract			
25	Bauer, Robert L, Hudleston, Peter J.	1982	Early recumbent folding across the boundary between the Vermilion granitic complex and the Vermilion District, NE Minnesota	VOYA
	No Abstract			
26	Bauer, Robert L, Hudleston, Peter J., Southwick, David L.	1992	Deformation across the western Quetico Subprovince and adjacent boundary regions in Minnesota	VOYA
	No Abstract			
27	Beltrame, R. J.	1977	Selected bibliography of Cuyuna Range geology, mining and metallurgy; Minn Geol Surv, Inf Circ	SACN
	No Abstract			

28	Benedict, James P.	1986	Mineral threat questionnaires	VOYA
	Copy of completed NPS Mineral Threat questionnaire. Contains lists of types of minerals (commodities) found in the park, and discusses what threats are posed and the impacts such threats would affect if they were to occur.			
29	Bennett, G, Leahy, E. J.	1981	1980 report of the Sault Sainte Marie Resident Geologist	SLBE
	No Abstract			
30	Bennison, A. P.	No Date	Geological highway map of the Great Lakes region; (11)	VOYA
	No Abstract			
31	Berg, R. C.	1978	Stop 3; major aspects of coastal stability along the Lake Michigan shore	INDU
	No Abstract			
32	Berkey, Charles Peter	1898	Geology of the St Croix Dalles	SACN
	Describes the topography and surface features of the Dalles area, glacial geologic history and evidence in the landscape, stratigraphy, and paleontology of the area. Includes maps (including surface geology and cultural features of the time), photos and illustrations of fossil specimens.			
33	Black, Frederick Michael	1977	The geology of the Turtle-Flambeau area; Iron and Ashland counties, Wisconsin	APIS
	No Abstract			
34	Black, R. F.	1970	Chronology and climate of Wisconsin and Upper Michigan - 14,000 to 9,000 radiocarbon years ago (Abstract); IN: American Quaternary Association, 1st Meeting, Yellowstone Park and Montana State University, Bozeman, MT, 1970, Abstracts	ISRO
	No Abstract			
35	Black, R. F.	1969	Valderan glaciation in western Upper Michigan; IN: International Association of Great Lakes Research, 12th Conference, Great Lakes Research 1969, Proceedings	ISRO
	No Abstract			
36	Black, R.F.	No Date	Geology of Ice Age National Scientific Reserve of Wisconsin	SACN
	The geology of the Ice Age National Scientific Reserve is detailed. The reserve ends at Interstate State Park, Wisconsin. A trail is being developed along geologic features spanning the length of the Reserve.			
37	Blewett, William	1995	Late Wisconsin history of Pictured Rocks National Lakeshore; National Park Service, Washington DC	PIRO
	No Abstract			
38	Bloomgren, B. A.	1985	Bedrock geologic and topographic maps of the Minneapolis-St Paul urban area, Minnesota; Miscellaneous Map Series (St Paul) M 57	SACN, MISS
	No Abstract			
39	Bloomgren, Bruce A, Cleland, Jane M., Olsen, Bruce M.	1989	Geologic atlas of Hennepin County, Minnesota; depth to bedrock and bedrock topography; County Atlas Series Minnesota Geological Survey Plate 4	MISS, SACN
	No Abstract			

40	Bona, Lisa J.	1990	Geomorphology and recent geologic history of Long Island-Apostle Islands National Lakeshore, Wisconsin	APIS
	Acquired in 1986, Long Island is the newest addition to the Apostle Islands National Lakeshore. Long Island has been joined with Chequamegon Point since 1975, and at other times in recorded history. Together, they form a barrier spit in Chequamegon Bay, on the south shore of Lake Superior. The spit is currently prograding on the distal end, at a rate of about 3.5 ft. (1.1 m) per year. Long Island, the study area, is comprised of a complex of east-west trending, parallel dune ridges and adjacent bog-filled swales, that are younger toward the lake. Possibly having formed originally as a barrier island on a topographic high in the very shallow water over the Chequamegon Bay bedrock shelf, it was later joined to the mainland by Chequamegon Point, facilitating longshore transport of sediment from the Bad River and eroding lakeshore bluffs. An undated shift in the outlet position of the Kakagon River from the bayside to the lakeside of Chequamegon Point may have also had a profound effect on the littoral drift budget. Using historical accounts, the landform's geologic development can only be traced since the early 17th century.			
41	Books, Kenneth G.	1972	Paleomagnetism of Some Lake Superior Keweenawan Rocks; U S Geological Survey Professional Paper No 760	ISRO
	No Abstract			
42	Booy, E.	1976	Engineering problems in Ontonagon Clay; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
43	Boucher, M. L.	1975	Copper-nickel mineralization in a drill core from the Duluth Complex of northern Minnesota; U S Bur Mines, Rep Invest	SACN
	No Abstract			
44	Brannon, J. C.	1984	Geochemistry of successive lava flows of the Keweenawan North Shore Volcanic Group	ISRO
	No Abstract			
45	Braun Intertec Engineering, Inc.	1993	Geotechnical evaluation for the proposed Voyageurs National Park roadway improvements in St Louis County, Minnesota	VOYA
	No Abstract			
46	Bricker, D. M.	1983	Part III, hydrocarbon production from the Prairie du Chien group	INDU
	No Abstract			
47	Bricker, D. M, Milstein, R. L., Reszka, C. R. Jr	1983	Selected studies of Cambro-Ordovician sediments within the Michigan Basin; report of investigation Geological Survey	INDU
	No Abstract			
48	Bristol, H. M, Treworgy, J. D.	1979	The Wabash Valley fault system in southeastern Illinois; Circular Illinois State Geological Survey	INDU
	No Abstract			
49	Broderick, T. M., Hohl, C. D.	1931	Geology and exploration in the Michigan Copper District; The Mining Congress Journal	ISRO
	Discusses the location of copper found in the bedrock; ie; the types of rocks copper is found in. Describes the two contrasting theories on the genesis of copper bearing rocks.			
50	Broderick, T. M., Hohl, C. D., Eidemiller, H. N.	1946	Recent contributions to the geology of the Michigan Copper District; Econ Geol	ISRO
	No Abstract			
51	Brown, Norman James	1956	The geology of the Stillwater, Minnesota Quadrangle	MISS, SACN
	No Abstract			

52	Buchheit, R. L, Malmquist, K. L., Niebuhr, J. R.	1989	Glacial drift geochemistry for strategic minerals; Duluth Complex, Lake County, Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	APIS
	No Abstract			
53	Buckley, Ernest Robertson	1898	Quarries of the Chequamegon area Pp 178-187 in On the Building and Ornamental Stones of Wisconsin; Wisconsin Geological and Natural History Survey	APIS
	This article describes brownstone quarries that were active in the Apostle Islands, including the Bass Island Brownstone Quarry and the Breckenridge Quarry on Bass (Basswood) Island, Ashland Brownstone Company quarry on "Presque Isle" (Stockton) Island, and Excelsior Brownstone quarry on Wilson (Hermit) Island. The location and history, observations about the quarry size and geology, economic considerations, and statistical information are described for each quarry.			
54	Butler, B. S., Burbank, W. S.	1929	The copper deposits of Michigan; U S Geological Survey Professional Paper Number 144	ISRO
	No Abstract			
55	Cahow, Adam	1985	Geology of the St Croix National Scenic Riverway	SACN
	The report examines the geologic history of the St. Croix River valley. It includes discussions of the watershed and drainage system, preglacial and glacial histories, and a comparison of the St. Croix and Namekagon valleys. The river geology is discussed in four sections covering the Namekagon valley, the upper and lower St. Croix River valleys, and the St. Croix Dalles.			
56	Cannon, W. F, Cameron, C. C., Grosz, A. E., Dunn, M. L. Jr, Gazdik, G. C., Hill, J. J.	1982	Mineral resources of the Rainbow Lake Wilderness Area and the Flynn Lake Wilderness Study Area, Bayfield County, Wisconsin; U S Geological Survey Bulletin	APIS
	A mineral-resource evaluation of a wilderness area and an adjacent wilderness study area was made in northern Wisconsin. Very thick Pleistocene glacial deposits cover bedrock containing a low-grade sedimentary copper deposit. Basalt flows could contain native copper, but no deposits have been found. The area contains about 210,000 short tons of commercial-quality peat and a great amount of sand and gravel.--from New Publications of the Geological Survey, Jan. 1982.			
57	Cannon, W. F, Dunn, M. L.	1984	Rainbow Lake Wilderness and Flynn Lake Wilderness Study Area, Wisconsin	APIS
	No Abstract			
58	Cannon, William F.	1996	1996 investigators annual report: geoarcheology of prehistoric copper mining on Isle Royale	ISRO
	This project melds to ongoing U.S.G.S. research activities to aid future archeological studies of prehistoric copper mining on Isle Royale. Those activities are 1) studies of the origin and distribution of native copper deposits in the Lake Superior region, and 2) studies of the post-glacial lake levels in the Lake Superior basin. Combining these two studies will allow predictions of the most likely sites where copper would have been found and mined at various times since the last glaciation. Finding from summer 1996 research are presented.			
59	Cannon, William F.	1998	Mercury in bedrock on Isle Royale, Michigan	ISRO
	Fish from Isle Royale's inland lakes have been shown to contain elevated levels of mercury which has raised the question of whether this is related to a local source of mercury in the bedrock or if the mercury is a result of recent atmospheric deposition. U. S. Geologial Survey scientists collected bedrock and mine tailing samples and these were tested for levels of mercury and other trace elements, and to see if mercury was mobilized and concentrated by the geological processes that formed native copper deposits. Findings indicate that mercury was elevated in samples containing native copper.			

60	Cary, S. J., Mcdowell, Pat, Graumlich, Lisa J.	1978	Soils and surficial geology of four Apostle Islands; annual meeting of Wisconsin Academy of Science, Arts, and Letters	APIS
	The soils and surficial geology of Rocky, Oak, York, and Raspberry Islands, members of the Apostle Islands group were surveyed in 1976 and 1977. The rich diversity of environmental factors affecting soil development has given rise to complex soilscapes. Most common on Rocky, York, and Raspberry Islands are fertile soils of deciduous forests (Eutroboralfs of the Alfisol order) formed in deposits of fine-grained glacial and glacio-lacustrine material. Prevalant on Oak Island are sandy Podzol soils (Haplorthods of the Spodosol order) formed in coarse beach deposits more than one meter thick. Since moderate slopes of 5 to 20% provided the best opportunity for thick sand and gravel accumulations in the ancient beach zones, the pedologic uniqueness of Oak Island can be explained by the sloping surface it presented to subsiding post-glacial lake levels.			
61	Chamberlain, Rollin T.	1905	The glacial features of the St Croix Dalles Region; The Journal of Geology	SACN
	Describes topography, glacial features and history of the Dalles area. Discusses post glacial geological change due to river erosion. Includes maps (pre-1905).			
62	Chernicoff, Stanley Edward	1980	The Superior-lobe and Grantsburg-sublobe tills; their compositional variability in East-central Minnesota	SACN
	No Abstract			
63	Chernicoff, Stanley Edward	1983	Glacial characteristics of a Pleistocene ice lobe in east-central Minnesota; Geological Society of America Bulletin	SACN
	Till deposited during the late Wisconsin advance of the Grantsburg sublobe. Texture, carbonate content, clay mineralogy, and magnetic susceptibility distinguish the tills and constitute the means of detecting dilution of Grantsburg tills. Grantsburg till changes as a consequence of prolonged contact with Superior lobe drift terrain.--Modified journal abstract.			
64	Cleland, Jane M, Tipping, Robert G., Bloomgren, Bruce A., Meints, Joyce	1990	Geologic atlas of Washington County, Minnesota; County Atlas Series Minnesota Geological Survey C 5	MISS
	No Abstract			
65	Cleland, Jane M, Wahl, Timothy E., Bloomgren, Bruce A., Hobbs, Howard C.	1990	Geologic atlas of Dakota County, Minnesota; County Atlas Series Minnesota Geological Survey	MISS
	No Abstract			
66	Coker, W. B., Shilts, W. W.	1979	Lacustrine geochemistry around the North Shore of Lake Superior --implications for evaluation of the effects of acid precipitation in: current research, Part C: Geological Survey of Canada Paper 79-1C	ISRO
	Geochemical data from the north shore of Lake Superior show that natural variations in the chemistry of bedrock lithologies, mineralization, and glacial sediment composition can be used to determine the effects of acid precipitation. Concentrations of trace metals in lake waters and sediment vary considerably and are affected by the underlying bedrock. Using concentrations of trace metals, it can be predicted which regions are sensitive to metal mobilization resulting from acidification of the terrain.			
67	Cole, Kenneth L., Davis, Margaret B., Solomon, Allen M., Winkler, Marjorie G.	1992	Holocene paleoenvironments in the Western Great Lakes Parks	VOYA
	The Western Great Lakes study area encompasses a region of steep east-west gradients in precipitation and continentality where the effects of greenhouse warming are expected to have large impacts on vegetation. This report contains a proposal to reconstruct a detailed record of the Holocene history of the Great Lakes parks (including Voyageurs) through analysis of fossil pollen and charcoal. Data will be integrated with GIS themes in order to develop a Paleogeographic Information System allowing the study of environmental change with greater spatial and temporal detail than has been previously accomplished.			

68	Collinson, C, Hansel, A. K., Norby, R. D.	1983	Shoreline processes and geomorphology, southwestern Lake Michigan (Field trip 6)	INDU
	The 60 miles of shoreline in Illinois is highly urbanized. Nevertheless, the shore ranges from completely natural at Illinois Beach Nature Preserve in the north to ocean-going ship harbors at Chicago and Calumet Harbor and steel works near the Indiana line. Consequently, the complete range of coastal problems are present that involve coastal processes, environmental impacts, water supply, fisheries, recreational areas, and private riparian developments. The south end of the lake retains the only significant example of emergent lake bed from prehistoric Lake Chicago. It extends from Michigan City, Indiana, on the east, westward through Indiana Dunes National Lakeshore some 40 miles to Chicago. There, most of the city rests on the old lake plain with its islands, spits, bars, beaches, terraces, and dune fields. Although most of the urban shore is armored, land filled, and highly developed, the old features still persist. From Waukegan northward, 14 miles of Holocene beach ridge and dune plain extend from a bluff and comprise a unique natural area. The terraces and ridges of the plain preserve a virtually complete record of lake history.			
69	Collinson, C, Lineback, J. A., DuMontelle, P. B., Brown, D. C., Davis, R. A. Jr, Larsen, C. E.	1974	Coastal geology, sedimentology, and management; Chicago and the northshore	INDU
	No Abstract			
70	Commonwealth Associates Inc., Woolworth Research Associates	1977	An archeological survey of the St Croix National Scenic Riverway: Phase I	SACN
	This report describes an archeological survey conducted on the St. Croix Riverway. The work covers a total of 77 sites that were located and studied. Descriptions of the areas soils, geology, and vegetation are included.			
71	Commonwealth Associates Inc., Woolworth Research Associates	1978	An archeological survey of the St Croix National Scenic Riverway: Phase II	SACN
	This report describes an archeological survey conducted on the St. Croix Riverway. The work covers a total of 60 sites that were located and studied. Descriptions of the areas soils, geology, and vegetation are included.			
72	Commonwealth Associates Inc., Woolworth Research Associates	1979	An archeological survey of the St Croix National Scenic Riverway: Summary report	SACN
	This report describes an archeological survey conducted on the St. Croix Riverway. The work covers a total of 80 sites that were located and studied. Descriptions of the areas soils, geology, and vegetation are included.			
73	Cooper, C. L.	No Date	Geological outline of Isle Royale	ISRO
	Describes the Keweenawan series (the exposed rocks of Isle Royale) and Isle Royale during the Quaternary period. Makes Recommendations for future geologic research and projects.			
74	Cordua, W. S.	1985	Rock elm Structure, Pierce County, Wisconsin; a possible cryptoexplosion structure; Geology (Boulder)	SACN
	No Abstract			
75	Cordua, W. S, Bauer, D. P., Gilbertson, J. P., Koskelin, K. M., Oberli, J. W.	1979	Geologic setting of copper mineralization in Precambrian (Keweenawan) basaltic volcanics and Upper Cambrian sediments in the St Croix Falls area, Wisconsin and Minnesota; Geol Soc Am, Abstr Programs	MISS
	No Abstract			
76	Cordua, William S.	1978	Geology of the St Croix Valley, Wisonsin and Minnesota; Tenth Annual University of Wisconsin Geologic Field Conference	SACN
	The event centered around a field trip to remarkable geologic features of the lower 52 miles of the river. The guidebook contains papers detailing the geology of seven areas: River Falls, Hudson, Dresser, and St. Croix Falls, Wisconsin, and Stillwater, Marine-on-St. Croix, and Taylors Falls, Minnesota. The works focus on the paleozoic period. Present are maps, drawings, and charts of the chronostratigraphic, lithostratigraphic, and dominant lithology (including thickness) of the geology. There are also details of fossils, rock formations and chemistry. A biblography is provided with each paper.			

77	Cornwall, Henry Rowlan, White, Walter Stanley	1955	Bedrock geology of the Manitou Island quadrangle, Michigan; Geologic Quadrangle Map U S Geological Survey	SLBE
	No Abstract			
78	Crawford, David	No Date	Geology of Interstate [Minnesota] Park	SACN
	An account on the formation of the geology of Interstate Park. Information includes the complex and interesting processes that occurred in the area's development.			
79	Crowns, Byron	1976	Wisconsin through 5 billion years of change	SACN
	This book begins with an analysis of the rocks found in the state, continues with a look at minerals, and provides understanding of the glacial history that affected Wisconsin, especially the St. Croix region. There are also chapters on how geology created the landforms and soils. Finally, there are sections on pre-European cultures and fossils found in the state.			
80	Cyrier, R. T.	1978	Effects of local geology on urban development of the Chicago metropolitan area; Geol Soc Am, Abstr Programs	INDU
	No Abstract			
81	Dakota County Planning Services	1980	Environmental inventory, Dakota County Minnesota	MISS
	This report provides an inventory of landforms, geology soils, water resources, vegetation and wildlife, climate, historic resources, and environmentally sensitive features in the county. Tables and figures highlight these themes and include land use and compatibility			
82	Daulton, Terry L.	1982	The glacial shoreline history of Apostle Islands	APIS
	This report provides a summary of the glacial shoreline history of the Apostle Islands. It also includes a table with estimated elevations about sea level at various glacial lake stages.			
83	Davis, S. E.	1976	A study of vegetation in relation to coastal formation and stability in the Indiana Dunes National Lakeshore	INDU
	No Abstract			
84	Day, Warren C.	1985	Bedrock geologic map of the Rainy Lake area, Northern Minnesota; Open File Report 85-02462	VOYA
	This is a topographic map overlaid with geologic areas/symbols. It includes a large portion of the Rainy District of Voyageurs National Park but does not depict any of the Kabetogama or Crane Lake areas. A timeline, notes on stratigraphy, age and structure, and a narrative on tectonic interpretation is also included on this sheet.			
85	Day, Warren C.	1990	Bedrock geologic map of the Rainy Lake area, northeastern Minnesota; Miscellaneous Investigations Series US Geological Survey	VOYA
	No Abstract			
86	Day, W. C, Klein, Terry L., Southwick, D. L., Schulz, Klaus J.	1988	Geological studies of the International Falls and Roseau 1 degrees by 2 degrees CUSMAP quadrangles, northern Minnesota	VOYA
	No Abstract			
87	Day, W. C, Sims, P. K.	1984	Tectonic evolution of the Rainy Lake area, northern Minnesota	VOYA
	No Abstract			
88	Day, W. C, Southwick, D. L., Schulz, K. J., Klein, T. L.	1987	Preliminary bedrock geologic map of the International Falls 1 degrees by 2 degrees Quadrangle, Minnesota, USA, and Ontario, Canada; U S Geological Survey Open file report	VOYA
	No Abstract			

89	Day, W. C, Southwick, D. L., Schulz, K. J., Klein, T. L.	1990	Bedrock geologic map of the International Falls 1 degrees X 2 degrees Quadrangle, Minnesota, United States, and Ontario, Canada; Miscellaneous Investigations Series US Geological Survey	VOYA
	No Abstract			
90	Dozier, J, Mitchell, J., Marsh, W. M.	1974	Modeling of backshore slope processes, south shore of Lake Superior	SACN, APIS, PIRO
	No Abstract			
91	Drexler, Christopher; Paddock, Mark W.	1975	The geology of the Pictured Rocks National Lakeshore; natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	PIRO, SLBE
	Information about bedrock geology, visitor impacts and the bedrock outcrops, and glacial and postglacial features of Pictured Rocks National Lakeshore, MI is presented in this report. The Jacobsville, Au Train, and Munising Formations are discussed, as well as the Miners Castle Member and Chapel Rock Member of the Munising Formation. Grand Portal Point, Au Sable Point, Chapel Rock, Chapel Falls, Miners Falls, Munising Falls, and the cliff between Sand Point and Miners Castle are addressed individually. A portion of the Mosquito River is given as an example of an east-flowing glacial meltwater channel. A map illustrates several locations in the Inland Buffer Zone, including the Miners Rivers, where meltwater flowed south in outlet channels.			
92	DuMontelle, P. B, Dixon, W. G., Cyrier, R. T.	1978	Engineering geology of the greater Chicago area and the south shore of Lake Michigan	INDU
	No Abstract			
93	Dustin, Fred	1936	Agates of the Lake Superior region; Rocks and Minerals	ISRO
	No Abstract			
94	Dustin, Fred	1931	The gems of Isle Royale; papers of the Michigan Academy of Science, Arts and Letters	ISRO
	Identifies rocks from which Isle Royale's gems are derived. Sandstone is barren of gems, lava and conglomerate form their matrices. Gives general descriptions and locations of Chlorastrolite or pumpellyite, lintonite, thomsonite, mesolite, carnelian, agates, prehnite, amethyst, rose quartz, chalcedony, jasper, opal, datolite, epidote, and wollastonite.			
95	Dustin, Fred	1935	The gems of Isle Royale, Michigan: the chlorastrolite;	ISRO
	No Abstract			
96	Dutton, C. E.	1983	Lithology and geologic setting of lower Proterozoic iron-formations in parts of northern Wisconsin; U S Geological Survey Open file report	SACN
	No Abstract			
97	Edil, T. B, Shultz, M. N.	1983	Landslide hazard potential determination along a shoreline segment; Engineering Geology	APIS
	A probabilistic approach to slumping hazard of bluffs along southwestern Lake Superior.--Modified journal abstract.			
98	Edward, B.	1980	Thomsonite Mine re-opens to public following six years of acrimony; Lapidary Journal 34 (3 (307))	SACN
	No Abstract			
99	Egington, Charles William	1975	Geology of the White Bear Lake West Quadrangle, Minnesota	SACN
	No Abstract			
100	Engstrom, W. N.	1985	Recent beach erosion along spits and cuspate forelands of Apostle Island National Lakeshore; Shore and Beach	APIS
	No Abstract			

101	Erwin, T. L.	1977	Indiana Dunes; another border to defend; Natl Parks Conserv Mag	INDU
	No Abstract			
102	Everson, C. I.	1977	Drift lithology in relation to bedrock geology, Long Island Lake Quadrangle, Cook County, Minnesota	GRPO
	No Abstract			
103	Farrand, W. R.	1982	Quaternary geology of southern Michigan	INDU
	No Abstract			
104	Farrand, William R.	1960	Former shorelines in western and northern Lake Superior Basin	APIS, ISRO
	Together with Stanley (1932), this work is the basis of most of what is known concerning ancient beach lines, the lakes they represent, rates of postglacial uplift, etc.			
105	Farrand, William R.	1970	Remarks on glacial and climatic events along the southern margin of the Laurentide ice sheet - Chairman's Summary (Abstract); IN: American Quaternary Association, 1st Meeting, Yellowstone Park and Montana State University, Bozeman, 1970, Abstracts	ISRO
	No Abstract			
106	Farrand, William R.	1982	The relationship of scour channels within Pictured Rocks National Lakeshore to the glacial geology of the Great Lakes Region	PIRO
	Channels scoured by flowing glacial meltwater in the north-central and northwestern Upper Peninsula, especially those of Pictured Rocks National Lakeshore, are discussed. The erosional and depositional features of flowing water in the Chapel Lake area are described. Management recommendations target Chapel Rock, Grand Portal, Miners Castle, and a well-exposed fault west of Twelvemile Beach for complete preservation. Limited protection is recommended for the meltwater outlet channels, the Nipissing beach ridges and small capping dunes of Miners Beach and Chapel Beach, and the Nipissing wave-cut cliffs and bluffs. Because of the friable (breakable) nature of the rock outcrops (exposed bedrock), it is recommended that high levels of human visitation not be allowed directly on those surfaces at Miners Castle, Munising Falls, etc. A map of Pictured Rocks National Lakeshore illustrates channels formed as the ice was retreating, as well as the Nipissing shoreline. Another map illustrates glacial meltwater channels from the north-central and northwestern Upper Peninsula.			
107	Farrand, William R., Drexler, C. W.	1985	Late Wisconsinian and Holocene History of the Lake Superior basin; IN: P F Karrow and P E Calkin (eds) Quaternary Evolution of the Great Lakes Geol Assoc Can Spec Pap 30	ISRO
	No Abstract			
108	Feirn, W. C.	1977	The geology of the early Precambrian rocks of the Jasper Lake area, Cook County, northeastern Minnesota	GRPO
	No Abstract			
109	Flakne, Robyn A., Cole, Kenneth L.	1995	The holocene landscape history of Isle Royale; Bulletin of the Ecological Society of America	ISRO
	No Abstract			
110	Foose, M. P, Cooper, R. W.	1978	Preliminary geologic map of the Harris Lake area, northeastern Minnesota; U S Geological Survey Open file report	VOYA
	No Abstract			
111	Foshag, William F., Larson, Esper S. Jr.	1922	Eakleite from Isle Royale, Michigan; American Mineralogist	ISRO
	No Abstract			

112	Foster, D. S, Brill, A. L., Brown, C. L., Folger, D. W., Andreasen, Christian, Carroll, D. G., Fromm, G. L., Seidel, D. R.	1992	Preliminary results of a pilot study conducted between St Joseph, Michigan and Michigan City, Indiana; U S Geological Survey Open file report	INDU
	No Abstract			
113	Foster, James	1929	Historical sketch of the Lake Superior Copper District; Lake Superior Min Inst Proc	ISRO
	No Abstract			
114	Foster, John W., Whitney, J. D.	1849	Synopsis of the explorations - in the Lake Superior land district in the Northern peninsula of Michigan; US, 31st Congress, 1st Session; Senate Executive Document 1 pt 3 & H Ex Doc 5 pt 3	ISRO
	No Abstract			
115	Foster, John W., Whitney, J. D.	1851	Report on the geology of the Lake Superior land district part I: Copper Lands	ISRO
	Commercial version of federal survey of Isle Royale resources.			
116	Foster, John W., Whitney, J. D.	1851	Report on the geology of the Lake Superior Land District Part II The Iron Region; Senate Executive Document No 4, Special Session, 32nd Congress	ISRO
	Early geological investigations in the State of Michigan, including Isle Royale.			
117	Foster, M. E, Hudleston, P. J.	1986	"Fracture cleavage" in the Duluth Complex, northeastern Minnesota; Geological Society of America Bulletin	SACN
	No Abstract			
118	Foster, Michael	1980	Analysis of small-scale structures in the Duluth Complex at Bardon Peak, St Louis County, Minnesota	SACN, VOYA
	No Abstract			
119	Fox, George R.	1952	Historic Mines of Isle Royale; Inland Seas	ISRO
	Summary of various Isle Royale mining operations. Very brief descriptions provided.			
120	Frankel, Leah	1994	A winter program to interpret geology at Sleeping Bear Dunes National Lakeshore	SLBE
	No Abstract			
121	Friske, P, Poulsen, K. M., Franklin, J. M.	1979	The Beidelman Bay porphyry copper-gold occurrences, Northwestern Ontario; Geol Assoc Can Mineral Assoc Can, Jt Annu Meet, Program Abstracts	VOYA
	No Abstract			
122	Fuller, George D. (Editor)	1928	Geological reports of Douglas Houghton: First State Geologist of Michigan, 1837-1845	ISRO
	No Abstract			
123	Fumerton, S. L.	1985	Geology of the Calm Lake area, District of Rainy River; Ontario Geological Survey Report	VOYA
	No Abstract			
124	Geerts, Stephen D.	1990	Geology and mineralization in the Dunka Road copper-nickel mineral deposit, St Louis County, Minnesota	SACN
	No Abstract			

125	Goldhaber, M. B. investigato, Reynolds, R. L. investigator	No Date	Presence of ore-stage marcasite and formation of roll-type deposits; Geological Survey Professional Paper (Washington, DC)	MISS
	No Abstract			
126	Graham, R. B.	1977	Peat and peat moss deposits in the Thunder Bay-Ignace area, northwestern Ontario	VOYA
	No Abstract			
127	Grant, Ulysses Sherman	1894	Note on the Keweenawan rocks of Grand Portage Island, north coast of Lake Superior; Am G 13 437 439, 1894 Abst, Minn, Univ, Q B 2:92	GRPO
	No Abstract			
128	Great Lakes Basin Commission	1976	Great Lakes basin framework study: Appendix 3: Geology and Ground Water	ISRO
	No Abstract			
129	Green, J. C.	1979	Field trip guidebook for the Keweenawan (upper Precambrian), North Shore Volcanic Group, Minnesota; Guideb Ser Minn Geol Surv	SACN
	No Abstract			
130	Green, J. C.	1982	Two Harbors sheet, bedrock geology; Geologic map of Minnesota	VOYA
	No Abstract			
131	Green, J. C, Jirsa, M. A., Moss, C. M.	1977	Environmental geology of the North Shore	VOYA
	No Abstract			
132	Green, John C, Chandler, Val C.	1985	Diabase dikes of the Midcontinent rift in Minnesota; a record of Keweenawan magmatism and tectonic development; The Geological Society of America, 98th annual meeting Abstracts with Programs Geological Society of America	GRPO
	No Abstract			
133	Griffin, James Bennet	1961	Lake Superior copper and the Indians - miscellaneous studies of the Great Lakes Prehistory; Michigan University Museum of Anthropology Anthropological Paper 17	ISRO
	Includes extensive data on prehistoric activities of Indian copper miners on Isle Royale. An anthology of articles on prehistoric and historic mining. Includes a Roy Drier's article on radiocarbon dating material from prehistoric mining pits on Isle Royale.			
134	Grigal, D.F., Ohmann, L.F.	1989	Spatial patterns in elemental concentrations of the forest floor across the north central United States; Journal of Environmental Quality	SACN
	Forest floor material was sampled in 171 forest stands representing five forest types across the states of Minnesota, Wisconsin and Michigan (including some stands in the St. Croix watershed). Elemental concentrations of forest floor material were related to forest type, and concentrations were also related to location as defined by five sampling zones along a northwest-southeast geographic gradient. Elemental occurrence described as consistent with atmospheric deposition of some elements from westerly soil-derived sources and others from eastern anthropogenic sources.			
135	Grim, Leland H.	1997	Notes and illustrations on the geology and ecology of Voyageurs National Park, Minnesota	VOYA
	Collection of tables, graphs and illustrations depicting the geologic history and ecology of Voyageurs National Park. The source of these materials is not identified. The collection was published as background information for the Summer Institute Participants in"The Eagles of Voyageurs National Park: GIS in the Environmental Education Classroom."			

136	Gross, Laura Blanche	1982	The stratigraphy and lithology of the glaciogenic sediments of the Two Harbors area, northeastern Minnesota	APIS
	No Abstract			
137	Gutschick, R. C, Cray, E. J. Jr leader	1982	Geology of the Kentland structural anomaly, northwestern Indiana; update, study for earth science students, field guide	INDU
	No Abstract			
138	Gutschick, Raymond C., Gonsiewski, James	1976	Coastal geology of the Mt Baldy area, Indiana Dunes National Lakeshore, South end of Lake Michigan - Field Guide; Western Michigan University Department of Geology, Kalamazoo 1976, Field Trip Guidebook - Coastal and environmental geology of southeastern Lake Michigan	INDU
	This paper begins with a geological history of the Great Lakes, including a diagram of the hydrologic cycle and seasonal lake level fluctuations. The geological history of the Mt. Baldy beach-dune profile and area is studied more specifically. There is a description of the erosional processes active along the lakeshore and the beach nourishment program. A plethora of figures accompany the text, including maps of the area and of ecological processes, lake elevations, bedrock stratigraphy, profiles before and after the nourishment project, and topographic maps. Appendices include photographs of the Mt. Baldy area, a paper on beach and bluff erosion on the lake between St. Joseph and Grand Mere Lakes, and information on Lincoln Township.			
139	Halls, H. C.	1966	A review of the Keweenawan geology of the Lake Superior Region	ISRO
	No Abstract			
140	Halls, H. C., West, G. F.	1971	The Isle Royale fault (ABS)	ISRO
	No Abstract			
141	Hamblin, William Kenneth	1961	Paleogeographic evolution of the Lake Superior region from late Keweenawan to late Cambrian time; Geological Society of America Bulletin	ISRO
	No Abstract			
142	Hamblin, William Kenneth	1961	Sources of the Keweenawan conglomerates of northern Michigan; Journal of Geology	ISRO
	The "Conglomerates on Isle Royale were derived from nearby highlands in Minnesota and Canada".			
143	Harris, Ann G., Tuttle, Esther	1983	Chapter 23: Isle Royale National Park; IN: Harris, Ann G and Esther Tuttle, Geology of National Parks, Third Edition, Kendall/Hunt Publishing Company, Dubuque, Iowa 1983	ISRO
	Describes geologic features of Isle Royale National Park including the Portage Lake Volcanics and Copper Harbor Conglomerate, copper, chlorastrolite (greenstone), and the effects of glaciation on the preglacial topography. The Geologic history of the Isle Royale area is summarized.			
144	Harris, Ann G., Tuttle, Esther	1990	Geology of the National Parks	VOYA
	Book providing details on the historic and structural geology of the National Parks. Includes a chapter on Voyageurs National Park.			
145	Harris, F.R.	1974	Geology of the Rainy Lake area, district of Rainy River	VOYA
	This report with accompanying maps describes the geology and mineral deposits of the Rainy Lake Area. The area is in the southwestern part of the Superior Province of Precambrian Shield and consists of a metasedimentary-metavolcanic sequence which has been intruded by anorthosite,gabbro, prophyritic quartz monzonite, granitic rocks and diabase.			
146	Hartke, E. J.	1984	Geology for environmental planning in Starke County, Indiana; Geological Survey Occasional Paper (Bloomington)	INDU
	No Abstract			
147	Hartley, Alan	1974	Outline of the geological history of Isle Royale	ISRO
	A brief description of the geological history of Isle Royale			

148	Hatch, Joseph R, Morey, G. B.	1984	Hydrocarbon source-rock evaluation; Solor Church Formation (middle Proterozoic, Keweenawan Supergroup), southeastern Minnesota; U S Geological Survey Open file report	MISS, SACN
	No Abstract			
149	Hayes, Mark J, Nelson, Charles L.	1990	Geology of Wright County using well log data	MISS
	No Abstract			
150	Heinselman, M. L.	1975	Some environmental and social challenges of copper-nickel mining in northeastern Minnesota	SACN
	No Abstract			
151	Hill, Catherine L, Ryan, Barbara J., McGregor, Bonnie A., Rust, Marie	1991	Our changing landscape; Indiana Dunes National Lakeshore; U S Geological Survey Circular	INDU
	The report describes the sources of impacts changing the landscape at Indiana Dunes National Lakeshore. Global, environmental, and human-induced impacts are all discussed.			
152	Hill, J. R.	1979	Geologic story of Dunes State Park; State Park Guide	INDU
	No Abstract			
153	Hill, J. R, Carr, D. D., Hartke, E. J., Rexroad, C. B.	1979	Geology as a contribution to land use planning in La Porte County, Indiana	INDU
	No Abstract			
154	Holst, T. B.	1984	Evidence for nappe development during the early Proterozoic Penokean Orogeny, Minnesota; Geology (Boulder)	SACN
	Two major phases of folding recognized in the Thomson Formation. Effects of the first deformation are found only in the southern two-thirds of the exposed formation; the second deformation affected the entire region of outcrop. Evidence that northward-directed nappes developed during the early phase of folding includes lithologic differences between the areas of one and two deformations, the pervasive nature of an S1 foliation in the area of its occurrence, facing directions of F2 folds, and the refraction pattern of the S1 foliation in graded metagraywacke-slate beds.--Modified journal abstract.			
155	Hooke, R. L, Matsch, C. L., Gasser, M. M.	1976	Implications of computer reconstructions of the Pleistocene Des Moines Lobe, Minnesota and Iowa; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
156	Horton, Robert J.	1987	Gravity survey data of the International Falls CUSMAP area, International Falls, Minnesota and Ontario, Canada; U S Geological Survey Open file report	VOYA
	No Abstract			
157	Horton, Robert J, Kucks, Robert P.	1988	Gravity survey data for the International Falls and Roseau CUSMAP projects, Minnesota, USA, and Ontario, Canada; (United States Geological Survey) Open file report	VOYA
	No Abstract			
158	Horton, R. J, Meyer, G. N., Bajc, A. J.	1989	Reconnaissance Quaternary geology map of the International Falls 1 degrees X 2 degrees Quadrangle; (United States Geological Survey) Open file report	VOYA
	No Abstract			
159	Hough, Jack L.	1958	Geology of the Great Lakes	ISRO
	Includes brief discussion of Isle Royale. A useful source to put the Isle's geology in a regional context.			

160	Hubbard, Lucius Lee	1895	Some notes towards a synopsis and index to Jackson's geological report on the Lake Superior region	ISRO
	According to the table of contents for this paper, pages 56-61 pertain to Isle Royale and those pages are not present in this copy. This report is a sort of directory to Jackson's report, in an attempt to organize the information found there. Under headings such as altitudes, minerals, fossils, glacial phenomenon, rocks, soils, and veins, etc., are references with page numbers where this information can be found in Jackson's Report. Though the pages pertaining specifically to Isle Royale are missing, this paper does contain other references to locations on Isle Royale in regard to its geology.			
161	Huber, Norman King	No Date	Key to specimens representing units on geologic map of Isle Royale	ISRO
	Map shows collection points for rock specimens located in the Isle Royale museum. Corresponding key gives description of the type of rock and where it was found.			
162	Huber, Norman King	1969	Pink copper-bearing prehnite from Isle Royale National Park, Michigan; IN: Geological Survey Research 1969, US Geological Survey Professional Paper 650-D U S Government Printing Office, 1969, Washington, D C	ISRO
	Pink prehnite, occurring as amygdules in Keweenawan lava flows in Isle Royale National Park and elsewhere in the Lake Superior region, has commonly been misidentified as thomsonite, which it superficially resembles. The pink color of the prehnite is due to internal reflections from finely disseminated native copper inclusions.			
163	Huber, Norman King	1971	The Keweenawan geology of Isle Royale, Michigan; open files reports	ISRO
	This report is the text of a talk given at Duluth, MN on May 6, 1971, at the Institute on Lake Superior Geology. Describes the Portage Lake Lava series and Copper Harbor Conglomerate.			
164	Huber, Norman King	1971	Glacial and postglacial geologic history of Isle Royale National Park, Michigan: contributions to the geology of Isle Royale National Park	ISRO
	Isle Royale was overridden by glacial ice during each of the four major glaciations of the Pleistocene Epoch. Because of the northerly location of Isle Royale, each successive glaciation essentially obliterated all direct evidence of preceding glaciations on the island. In the waning phase of the last major glaciation, the Wisconsin Glaciation, the frontal ice margin retreated northward from at least the greater part of the Lake Superior basin, then readvanced into the basin during Valders time. It is to the Valders ice that we can attribute the final aspect of glaciation on Isle Royale. It is impossible to estimate the quantity of earlier glacial debris or other surficial materials that might have been present on Isle Royale prior to the Valders readvance, but the readvancing ice appears to have removed most of what might have been present. As the Valders ice itself retreated northward, a series of lakes formed in the Lake Superior basin in front of the retreating ice margin. The map shows areas with extensive glacial debris; ice-margin deposits; glacial striation; drumlin; and abandoned shorelines.			
165	Huber, Norman King	1972	Keweenawan geology of Isle Royale, Michigan; Geological Society of America, Abstracts with programs	ISRO
	No Abstract			
166	Huber, Norman King	1973	The Portage Lake volcanics (Middle Keweenawan) on Isle Royale, Michigan; Geological Survey Professional Paper 754-C US Government Printing Office, 1973, Washington, DC	ISRO
	Presents detailed description of the volcanic rock sequence on Isle Royale. On Isle Royale, the Portage Lake Volcanics formations consists of more than 10,000 feet of basaltic and andesitic lava flows with interbedded pyroclastic rocks and fluvially deposited sedimentary rocks. Twelve stratigraphic flow units have been distinguished and named on Isle Royale. Correlation between the Portage Lake Volcanics on Isle Royale and the type area some 50 miles southeast on the Keweenaw Peninsula on the opposite side of the Lake Superior is excellent, and at least one individual lava flow is interpreted as being continuous across the basin.			

167	Huber, Norman King	1973	Geologic map of Isle Royale National Park, Keweenaw County, Michigan; US Geological Survey miscellaneous geologic investigations map I-796	ISRO
	The bedrock sequence of Isle Royale consists of two formations, the Portage Lake Volcanics, and the overlying Copper Harbor Conglomerate, both of Precambrian (middle Keweenawan) age. Map shows distribution of Keweenawan rocks in the Lake Superior Region. The Isle Royale map names and shows location of flows within the Portage Lake Volcanics, Copper Harbor conglomerates, as well as alluvium, talus, and glacial till.			
168	Huber, Norman King	1973	The geologic story of Isle Royale National Park	ISRO
	A unpublished manuscript concerning the geologic history of Isle Royale. Includes descriptions of the types of rocks that make up Isle Royale including stratigraphy. Discusses geologic time and the effects of glaciation. Describes minerals of special interest including copper, chlorastrolite (Isle Royale greenstone), prehnite, and agate.			
169	Huber, Norman King	1973	Glacial and postglacial geologic history of Isle Royale National Park, Michigan; Geological Survey Professional Paper 754-A	ISRO
	Isle Royale was overridden by glacial ice during each of the four major glaciations of the Pleistocene Epoch, and each successive glaciation essentially obliterated all direct evidence of preceding glaciations on the island. The final aspect of glaciation on Isle Royale can be attributed to the Valders time, including both erosional and depositional features. During the Valders retreat, a series of lakes formed in the Lake Superior basin in front of the retreating ice margin. Abundant deposits of glacial debris were left upon the newly deglaciated west end of the island, and the ice front remained stable long enough to build a complex of ice margin deposits across the island. Shorelines formed by the glacial lake associated with this ice front are found on the western part of the island about 200 feet above present Lake Superior. Only a minor amount of glacial debris was deposited on the central and eastern parts of the island. Lake Minong was formed when the ice margin reached the north edge of the Lake Superior basin and the entire basin was filled for the first time since the Valders advance. Its beaches are among the best developed of the abandoned shoreline features on Isle Royale.			
170	Huber, Norman King	1975	The geologic story of Isle Royale National Park; Geological Survey Bulletin No 1309	ISRO
	A booklet concerning the geologic history of Isle Royale. Includes descriptions of the types of rocks that make up ISRO including the way they are arranged. Discusses geologic time and the effects of glaciation. Describes minerals of special interest including copper, chlorastrolite (Isle Royale greenstone), prehnite, and agate.			
171	Huffman, Samuel F.	1986	Description of the Bryozoan fauna from the Decorah formation (middle Ordovician) of Pierce and St Croix Counties, Wisconsin	SACN
	Provides details on fossil remains located in Wisconsin counties along the lower St. Croix River.			
172	Hyrkas, Gerald Lee	1982	The sedimentology and structural geology of the middle Precambrian Thomson Formation, central Carlton County, Minnesota	SACN
	No Abstract			
173	Irving, Roland Duer	1883	The copper-bearing rocks of Lake Superior; Department of the Interior, monographs of the United States Geological Survey, Volume V	ISRO
	Chapter 7, "The Keweenawan Rocks of the North and East Shores of Lake Superior", Section II - Isle Royale to Nipigon Bay, pages 329-340. This is an early, brief, geological description of Isle Royale.			
174	Irving, Roland Duer	1880	General geology of the Lake Superior region; IN: Geology of Wisconsin - survey of 1873-1879	ISRO
	No Abstract			
175	Isle Royale National Park	No Date	Geology collection	ISRO
	Collection includes 93 specimens of various rock types found on Isle Royale, hammerstones, core samples from the Wendigo Mine.			
176	Jackson, Charles T.	1854	Analyses of pitchstone porphyry from Isle Royale and of a crystal of phosphate of lime from Hurdstown, New Jersey; American Journal of Science and Arts, 2d Series	ISRO
	No Abstract			

177	Jackson, Charles T.	1849	Geological and mineralogical reports	ISRO
	A work that is supplemented by the Foster and Whitney Reports (1850 and 1851) to give excellent early descriptions of Isle Royale. A work that gives excellent descriptions of early mining on Isle Royale. Jackson was the leader of the initial federal geological study of Isle Royale.			
178	Jackson, Charles T.	1849	Geological map of Isle Royale, Lake Superior	ISRO
	One of the early and well-crafted maps of Isle Royale. Shows mine sites and fishing camps. Excellent for Isle Royale research and a basic document of the study of the Island.			
179	Jackson, Charles T.	1849	Report on the geological and mineral survey of mineral lands of the United States in the State of Michigan; Senate Executive Document, 31st Congress, 1st Session (Washington, DC, 1949, No 1, Prt 3 (found a similar reference in the Lawrence Rakestraw collection that reads 31st Congress, 1st Session, House Exec Doc No 5, Vol 3, pt 2)	ISRO
	No Abstract			
180	Jackson, Charles T.	1850	On the geological structure of Keweenaw Point: Isle Royale; proceedings of the American Association for the Advancement of Science	ISRO
	No Abstract			
181	Jackson, Charles T.	1850	Report on the geological and mineralogical survey of the mineral lands of the United States in the State of Michigan; House Executive Documents, 31st Congress, 1st Session, Volume 3, Number 1, Part 3 United States Government Serials Document, Vol 571	ISRO
	No Abstract			
182	Jagger, Leslie A., Pregitzer, Kurt S.	1997	Ecological characterizations of fifteen land type associations within the eastern Upper Peninsula of Michigan	PIRO
	The report contains Land Type Associations used to describe Michigan's eastern Upper Peninsula. The data was provided to aid in the conservation and management of forest resources. Vegetation, hydrology, geology, soils, climate, and special natural features are described in the report. Maps containing general vegetation trends are included, as well.			
183	Jirsa, Mark A, Boerboom, Terrence J.	1990	Bedrock geologic map of parts of Koochiching, Itasca, and Beltrami counties, north-central Minnesota; Miscellaneous Map Series (St Paul)	VOYA
	No Abstract			
184	Jirsa, Mark A, Olsen, Bruce M., Bloomgren, Bruce A.	1986	Bedrock geologic and topographic maps of the seven-county Twin Cities metropolitan area, Minnesota; Miscellaneous Map Series (St Paul) M 55	MISS
	No Abstract			
185	Johns, Mary K, Jackson, Michael J., Hudleston, Peter J.	1992	Compositional control of magnetic anisotropy in the Thomson Formation, east-central Minnesota; Tectonophysics	SACN
	No Abstract			
186	Johnson, Charles N.	1987	Rubble beaches versus rubble revetments	INDU
	No Abstract			
187	Johnson, Gerald W.	1989	Petrographic and structural interpretation of displacement along the Burntside Lake fault zone Basswood Lake area, northern Minnesota	VOYA
	No Abstract			

188	Johnson, Mark Dale	1980	Origin of the Lake Superior red clay and glacial history of Wisconsin's Lake Superior shoreline west of the Bayfield	SACN
	No Abstract			
189	Johnson, Mark Dale	1984	Glacial geology of Barron County, Wisconsin	SACN
	No Abstract			
190	Johnson, R. E.	1978	Preliminary mine planning at the Minnamax Project	VOYA
	No Abstract			
191	Johnsson, Robert G.	1959	A history of the Lake Superior basin	ISRO
	A summary of the geologic history pertaining to the Lake Superior basin including Isle Royale.			
192	Joyce, F. E. Jr	1971	Extraction of copper and nickel from the Duluth gabbro complex by selective high-temperature sulfatization; U S Bur Mines, Rep Invest	SACN
	No Abstract			
193	King, James Michael	1983	Hydrogeology and numerical modeling of the Flambeau mine site, Rusk County, Wisconsin	SACN
	I devised numerical models of the ground-water flow systems at the mine site and at an associated tailings-disposal area to assist in hydrologic-impact evaluation. After defining the flow systems using field and laboratory data, the Pleistocene glacial deposits and a Cambrian sandstone at each site were modeled as single-layer unconfined aquifers overlying the Precambrian surface. Simulations assuming that tailings and waste rock would be placed directly on the natural land surface inside the structure predicted maximum steady-state water-loss rates of 72 and 140 gpm for waste accumulations of 25 and 50 feet, respectively. Both simulations indicated some ground-water mounding beneath the structure and suggested that surface seepage could occur along all sides of the site. Simulating the effects of lining the impoundment with compacted clay saprolite to reduce seepage was unsatisfactory due to the prominent role of unsaturated flow under these conditions.--Author abstract.			
194	Klasner, J. S, Wold, R. J., Hinze, W. J., Bacon, L. O., O'Hara, N. W.	1978	Bouguer gravity anomaly map of northern Michigan and Lake Superior and its geological implications; Eos (Am Geophys Union, Trans)	SACN
	No Abstract			
195	Klein, T. L, Brown, F. W., Jackson, J. C., Taggart, J. E. Jr, Ardith, J., Bartel, J., Stewart, K., Palmer, C., Wandless, G. A., Crock, J., Wilson, S. A., Brown, Z. A., Skeen, C. J., Crandell, W. B., Moore, Roosevelt, Rait, N., Smith, H., Bauer, R., Steineck, R., Day, W. C.	1987	Geochemical data from the International Falls and Roseau, Minnesota CUSMAP projects; U S Geological Survey Open file report	VOYA
	No Abstract			
196	Klein, Terry L.	1988	Tabulated geochemistry of bedrock samples from exploration drilling in the Roseau and the western-part International Falls 1 degrees by 2 degrees Quadrangles, northern Minnesota; (United States Geological Survey) Open file report	VOYA
	No Abstract			
197	Klein, Terry L.	1989	Mineral occurrence and drill-hole location map of the International Falls 1 degrees X 2 degrees Quadrangle, Minnesota and Ontario; Miscellaneous Field Studies Map (United States Geological Survey)	VOYA
	No Abstract			

198	Klein, Terry L, Day, Warren C.	1989	Tabular summary for lithologic logs and geologic characteristics from diamond drill holes in the western International Falls and the Roseau 1 degrees X 2 degrees quadrangles, northern Minnesota; (United States Geological Survey) Open file report	VOYA
	No Abstract			
199	Kolata, D. R, Dean, L. L.	1978	Stop 1; Thornton quarry and reef	INDU
	No Abstract			
200	Kowalski, William L.	1976	Geology, soils, and recreational limitations of Bear Island, Apostle Islands National Lakeshore; Proceedings of the First Conference	APIS
	A Quaternary geologic history of Bear Island is formulated with emphasis from the most recent glaciation (Valders Stage of Lake Wisconsin glaciation) through the ensuing post-glacial lake stages to the present. Abandoned shorelines from past levels of postglacial Lake Superior are evident. These shorelines correlate with glacial lake stages of the post-Duluth series which occupied the Lake Superior basin approximately 10,000 years ago. Maps depicting abandoned shorelines and depth to bedrock are presented. All soil materials on Bear Island exhibit evidence of being water laid deposits. Soil borings reveal these materials to be variable in depth, 0 to 5 feet or more over sandstone bedrock. Soils vary in texture from sand to clay and in drainage from poorly drained to well drained. A Bear Island soils map is presented. Soils are rates as to the limitations they pose for specific recreational uses (i.e., paths and trails, campsites and picnic areas, and septic tank disposal fields) and presented on color-coded soil limitation maps. By interpreting these maps, park planners will be able to locate potential sites for public enjoyment in areas that will best tolerate human impact.			
201	Kramer, J. R, Conroy, N.	1982	Excursion 14A; precambrian sediments and environmental aspects	SLBE
	No Abstract			
202	Kuhns, Mary Jo P, Hauck, Steven A., Barnes, Randal J.	1990	Origin and occurrence of platinum group elements, gold and silver in the South Filson Creek copper-nickel mineral deposit, Lake County, Minnesota	APIS
	No Abstract			
203	Lane, Alfred C.	1898	Geological Report on Isle Royale, Michigan; Geological Survey of Michigan	ISRO
	First comprehensive report on the geology of Isle Royale includes descriptions of exploration activities on the island through 1896. Chapters of this report included in the Library's copy are: Historical Introduction, Construction of Cross Section from Drill Records,			
204	Lane, Alfred C.	1899	Isle Royale: An Historical Spot with a Romantic History; what has been accomplished in unearthing its mineral wealth; Michigan Miner	ISRO
	Concluded in 1(12):14-18. A review of the mineral exploration on Isle Royale. Describes mining companies, mining locations and descriptions of the rocks that copper veins are located in as well as the quality of the copper in each vein. The last portion of the continued article describes the maps made during this period which describe the mine locations and geology.			
205	Lane, Alfred C.	1911	The Keweenaw series of Michigan; Michigan Geological and Biological Survey Publication 6: Geol Ser 4, Vol I	ISRO
	No Abstract			
206	Lane, Alfred C., Stockly, W. W.	1897	Geological map of Isle Royale, Lake Superior, Michigan	ISRO
	Geological Map showing locations of each segment of the Keweenaw Series as they exist on Isle Royale. The map found in the map collection cabinet is hand-colored. Karamanski, Zeitlin and DeRose (1988) describe this map as being particularly useful for understanding the final mineralogical exploration on Isle Royale.			
207	Laney, R. T, Van, Schmus W. R.	1978	A structural study of the Kentland, Indiana impact site	INDU
	No Abstract			

208	Lapham, W. W.	No Date	Tritium analyses for the Indiana Dunes National Lakeshore; U S Geological Survey Professional Paper	INDU
	No Abstract			
209	Larsen, C. E.	1985	A stratigraphic study of beach features on the southwestern shore of Lake Michigan; new evidence of Holocene lake level fluctuations; Environmental Geology Notes	INDU
	No Abstract			
210	Larson, Robert James	1968	The Mott Island conglomerate, Isle Royale National Park, Michigan	ISRO
	Describes the conglomerate found on Mott Island in Isle Royale National Park, its origin and how this conglomerate is different than that found in the southern flank of the Lake Superior syncline.			
211	Leith, A., Lund, R. J., Leith, A.	1935	Pre-Cambrian rocks of the Lake Superior Region; U S Geological Survey Professional Paper #184	ISRO
	No Abstract			
212	Leith, C. K., Van Hise, Charles R.	1911	The geology of the Lake Superior region; U S Geological Survey Monographs, Volume 52	ISRO
	Basic text which made extensive use of the data uncovered by the diamond drill core samples bored on Isle Royale. Demonstrates the importance of the fishing carried out on Isle Royale by the Wendigo Mine engineers.			
213	Leverett, Frank	1929	Moraines and shorelines of the Lake Superior basin	ISRO
	No Abstract			
214	Lineback, J. A, Dell, C. I., Gross, D. L.	1979	Glacial and postglacial sediments in Lakes Superior and Michigan; Geol Soc Am, Bull	SACN
	No Abstract			
215	Lively, R. S.	1983	A U-series speleothem growth record from southeastern Minnesota	SACN
	No Abstract			
216	Longo, Anthony A.	1984	A correlation for a middle Keweenawan flood basalt: the Greenstone flow, Isle Royale and Keweenaw Peninsula, Michigan	ISRO
	The Greenstone flow of the Portage Lake Volcanics may be the largest lava flow on earth. In this study the tholeiitic Greenstone flow has been correlated across the Lake Superior syncline from Isle Royale to the Keweenaw Peninsula of Michigan. The maximum observed thickness of the Greenstone flow is 427 meters and its estimated volume is 650 km.			
217	Lowdon, J. A, Blake, W. Jr	1979	Geological survey of Canada; radiocarbon dates XIX; Paper Geological Survey of Canada	MISS
	No Abstract			
218	Luoma, H. L.	1946	Isle Royale greenstone - chlorastrolite; The Mineralogist (Portland, Oregon)	ISRO
	No Abstract			
219	Maass, R. S, Van, Schmus W. R., Medaris, L. G. Jr	1978	Deformational history of lower and middle Precambrian basement rocks in central Wisconsin; Eos (Am Geophys Union, Trans)	SACN
	No Abstract			

220	Macrae, M. E., Cannon, William F., Woodruff, L. G.	1998	Post-Glacial Shorelines of Isle Royale - Where are they now?	ISRO
	This is an abstract for a poster presentation to be made at the Institute on Lake Superior Geology meeting to be held in Minneapolis in early May of 1998 and will be published in the proceedings of the meeting. Geographic information systems (GIS) software was used to construct a sequence of Digital Elevation Models (DEM) showing the island's morphology at several different historic lake stages.			
221	Madsen, E. L, Norvitch, R. F.	1979	Hydraulic properties and tunneling constraints	MISS
	No Abstract			
222	Madsen, E. L, Norvitch, R. F.	1979	Hydrogeologic setting	MISS
	No Abstract			
223	Marsden, R. W.	1978	Iron ore reserves of Wisconsin; a minerals availability system report	APIS
	No Abstract			
224	Marshall, Timothy B.	1979	Compressed air storage in Paleozoic sandstones of southeastern Minnesota	MISS
	No Abstract			
225	Martin, D. P, Meyer, G., Cartwright, D. F., Lawler, T. L., Pastika, T., Jirsa, M. A., Boerboom, T. J., Streitz, A. R.	1989	Regional geochemistry survey of glacial drift drill samples over Archean granite-greenstone terrane in the Effie area, northern Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	VOYA
	No Abstract			
226	Martin, Helen M, Straight, Muriel Tara	1956	Index of the geology of Michigan, 1823-1955; Michigan Geological Survey Division Publication	ISRO
	No Abstract			
227	Matsch, Charles L.	1962	Pleistocene geology of the St Paul Park and Prescott quadrangles (Minn)	MISS, SACN
	No Abstract			
228	May, E. R.	1977	Flambeau; a Precambrian supergene enriched massive sulfide deposit; Geosci Wis	MISS
	No Abstract			
229	McCabe, C, Van, der Voo R., Watts, D. R.	1980	Paleomagnetic results from the upper Keweenawan Chequamegon formation, Apostle Islands, Wisconsin	APIS
	No Abstract			
230	Mccabe, Chad	1980	Paleomagnetic results from the upper Keweenawan Chequamegon formation, Apostle Islands, Wisconsin; American Geophysical Union, Annual Midwest Meeting	APIS
	Chemical demagnetization has revealed that the red beds samples contain a typical Keweenawan magnetization as well as a later (probably recent) magnetic overprint. Both magnetizations apparently reside in hematite although further studies are necessary to determine if there are detrital carriers such as magnetite or maghemite. The Keweenawan paleopole is of interest because it falls near the grenville track of the North American apparent polar wander path and confirms Doyle Watts; contention that 1) the magnetizations are Middle to Late Proterozoic, 2) that the Grenville track is a part of the cratonic North American apparent polar wander path and not the result of convergent Grenville-Superior plate motions, and that 3) the notion of a 180o long Hadrynian track as proposed by Roy and Robertson (1978) is unfounded. Rockmagnetic and electron microscope studies are planned for the near future to complete this investigation.			

231	McGovney, J. E.	1978	Deposition, porosity evolution, and diagenesis of the Thornton Reef (Silurian), northeastern Illinois	INDU
	No Abstract			
232	McGovney, J. E.	1979	Deposition and diagenesis of the Thornton Reef (Silurian, northeastern Illinois); Geol Soc Am, Abstr Programs	INDU
	No Abstract			
233	McSwiggen, Peter L.	1987	Geology and geophysics of the Denham-Mahtowa area, east-central Minnesota; Miscellaneous Map Series (St Paul) M 63	SACN
	No Abstract			
234	Meineke, D. G, Vadis, M. K., Gilgosch, M. A.	1976	Geophysical surveys conducted in northwestern Koochiching County, Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	VOYA
	No Abstract			
235	Meineke, D. G, Vadis, M. K., Klaysmat, A. W.	1977	Pilot study on soil exploration geochemistry, Birch Lake area, Lake County, Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	APIS
	No Abstract			
236	Meisburger, E. P, Williams, S. J., Prins, D. A.	1979	Sand resources of southeastern Lake Michigan; U S Army, Coastal Eng Res Cent, Misc Rep	INDU
	No Abstract			
237	Meller, Henry V.	1986	The erosional affect of joint orientations in the Bayfield Sandstone group on the orientation and shape of the Apostle Islands of western Lake Superior, Bayfield, Wisconsin	APIS
	The Keweenawan sedimentary rocks of the Lake Superior Region were formed in late Precambrian time and are estimated to be 25,000 ft thick. The Apostle Islands consist of the Bayfield group which is a quartzose sandstone that lies at the top of this sedimentary sequence. Following the deposition of these sediments the Apostle Islands area was broken by several large thrust faults and several small normal ones such as the Douglas Fault, which can be traced extensively throughout the area from the southwest to the northeast. The estimated vertical offset of this fault is 10,000 ft with the rock column to the south having been uplifted relative to that of the north column. It is likely the result of this tectonic activity which accounts for the presence of such a variety of joint readings within the Bayfield group of the Apostle Islands. These joints, of which most are vertical, clearly control island erosion (usually occuring perpendicular to that of the joint strikes). East-west joints give the islands a north-south linear shape. The outer margin of the islands is the area which is most affected by the open waters of Lake Superior and therefore takes the brunt of wind and wave action.			
238	Mengel, J. T.	1976	Red clay characteristics in relation to slope stability in the Little Balsam drainage	SACN
	No Abstract			
239	Meyer, G. N.	1985	Quaternary geologic map of the Minneapolis-St Paul urban area, Minnesota; Miscellaneous Map Series (St Paul) M 54	MISS
	No Abstract			
240	Meyer, Gary N, Hobbs, Howard C.	1989	Geologic atlas of Hennepin County, Minnesota; Surficial geology; County Atlas Series Minnesota Geological Survey	SACN
	No Abstract			
241	Meyer, Gary N., Jirsa, Mark A.	1984	Aggregate resources inventory, Twin Cities Metropolitan Area, Minnesota	MISS
	The report details the sand and gravel aggregate resources in the Minneapolis/St. Paul Area. Included are classifications, quantity and quality of these resources, and discussions of ice-contacted and outwash materials. Also included are bedrock aggregate resources, table of descriptive data, and a map of the Twin Cities aggregate resources.			

242	Meyers, D, Chang, L. L. Y.	1977	Mineralogy of the red clay and its relation to slope stability in Douglas County, Wisconsin; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
243	Michelson, R. W, Polta, H. J., Peterson, O.	1970	Evaluating the economic availability of Mesabi Range taconite iron ores with computerized models; U S Bur Mines, Inf Circ	SACN
	No Abstract			
244	Mickelson, D. M, Acomb, L. J., Edil, T. B.	1979	The origin of preconsolidated and normally consolidated tills in eastern Wisconsin, USA	SACN
	No Abstract			
245	Minnesota Department Of Natural Resources	No Date	Mineral activity, exploration drill holes and the drill core index - June, 1993	VOYA
	Map of Minnesota depicting the following: current state metallic mineral leases, areas with identified Cu-Ni and Titanium resources, iron formations with identified manganese resources, areas offered for CN/MM leasing, and drill core indexes. Voyageurs National Park areas are not included, however, areas adjacent to the park are.			
246	Minnesota Department Of Natural Resources	1984	Regional minerals map	VOYA
	Large scale map showing greenstone belts, iron mines and nonferrous mineral deposits in the states of Minnesota and Wisconsin, and portions of the Canadian province of Ontario. Includes deposits in Voyageurs National Park.			
247	Minnesota Department Of Natural Resources(Minerals Division)	1985	Ranier project - geophysical surveys	VOYA
	Collection of maps and data sheets provide detailed information on the geophysical and geomorphic properties of the Ranier Area just outside Voyageurs National Park. Since this area is located along the same Greenstone Belt as the Park is , some extrapolation of the data is possible.			
248	Minnesota Department Of Natural Resources, Mississippi National River And Recreational Area, U.S. Geological Survey, U.S. Department Of Housing And Urban Development	1997	Map collection	MISS
	Contained in the map file are various maps which include the Mississippi River. Furnished are Minnesota Department of Natural Resources maps called, "Minnesota Wetlands and Surface Water Resources" and the "County Biological Survey of Rare Communities for Anoka, Ramsey, and Washington Counties. Also included are U.S.G.S. topographic maps in mylar 7.5 minute (1:24,000), enlarged digitized topographic maps, U.S.G.S. geosensitive maps, digitized landcover, 1895 topographic maps (1:20,000), and U.S. Housing and Urban Development Floodplain maps.			
249	Minnesota Geological Survey	1990	Geologic atlas-Washington County, Minnesota	SACN
	Set of detailed maps including bedrock geology, surficial geology, bedrock topography and depth to bedrock, hydrogeology, sensitivity of ground-water systems to pollution, geology and well construction and data-base maps. County will soon digitize this atlas and use it as a part of a county geographic information system.			
250	Minnesota Geological Survey, University Of Minnesota	1969	The proposed Voyageurs National Park: Its geology and mineral potential	VOYA
	The proposed Voyageurs National Park is a scenic glaciated area which straddles the transition zone from granitic rocks of the Vermilion Batholith on the south to metamorphosed sedimentary and volcanic rocks on the north. Biotite schist is the most abundant rock type in the area. Samples taken from a "greenstone belt" that passed through the extreme northwestern corner of the proposed park contained anomalous amounts of gold, silver, copper and platinum. Sampling was inadequate to test the full mineral potential, but indicate the possible existence of significant mineral deposits within the belt. The presence of these deposits suggests that the area should remain open for prospecting and possible mining, therefore making it unsuitable for inclusion in the proposed park. This report presents and discusses the analysis of the samples, and contains maps depicting the findings.			

251	Mollard, D. G.	1979	Thunder Bay; Northen Ontario engineering geology terrain study; light construction capability map	GRPO
	No Abstract			
252	Mollard, D. G.	1979	Thunder Bay; Northern Ontario engineering geology terrain study; data base map	GRPO
	No Abstract			
253	Mollard, D. G, Mollard, J. D.	1980	Agnes Lake area (NTS 52B/SW), District of Rainy River; Northern Ontario engineering geology terrain study	VOYA
	No Abstract			
254	Montgomery, William Willson	1977	Deformation of the Tyler Slate (middle Precambrian) in northern Wisconsin and western upper Michigan	SACN
	No Abstract			
255	Moran, S. R, Arndt, M., Bluemle, J. P., Camara, M., Clayton, L., Fenton, M. M., Harris, K. L., Hobbs, H. C., Sackreiter, D. K., Salomon, N. L., Teller, J.	1975	Quaternary stratigraphy and history of the plains of North Dakota, Manitoba, and Minnesota	MISS
	No Abstract			
256	Morey, G.B.	1978	Metamorphism in the Lake Superior region, USA, and its relation to crustal evolution; Metamorphism In The Canadian Shield	VOYA
	Precambrian rocks in the Lake Superior Region range in age from 3800 to 1100 Ma. This report divides the rock record into five terranes that have similar metamorphic attributes and discusses each in detail. Maps depicting each terrane are provided along with tables inventorying diagnostic metamorphic minerals and mineral assemblages for several of the terranes. Maps and discussion include all areas of Voyageurs National Park			
257	Morey, G. B.	1979	Day 8; Ironwood, Michigan, to Eveleth, Minnesota	SACN
	No Abstract			
258	Morey, G. B.	1979	The western Vermilion District; a review	SACN
	No Abstract			
259	Morey, G. B.	1980	A brief review of the geology of the western Vermilion District, northeastern Minnesota	VOYA
	No Abstract			
260	Morey, G. B.	1983	Lower Proterozoic stratified rocks and the Penokean Orogeny in east-central Minnesota	SACN
	Evolution of the Animikie Basin can be divided into an extensional stage with attendant deposition of stratified rocks, and a subsequent compressional stage assigned to the Penokean Orogeny. Two zones: (1) a relatively thin succession of predominantly sedimentary rocks north of the Great Lakes tectonic zone and (2) a much thicker succession of intercalated sedimentary and volcanic rocks to the south.--Modified journal abstract.			
261	Morey, G.B., Green, J.C., Ojakangas, R.W., Sims, P.K.	1970	Stratigraphy of the lower Precambrian rocks in the Vermillion District, Northeastern Minnesota	VOYA
	No Abstract			
262	Morey, G. B, Lively, R. S.	1980	Detailed geochemical survey for East-central Minnesota, geology and geochemistry of selected uranium targets	SACN
	No Abstract			

263	Morey, G. B, Olson, B. M., Southwick, D. L.	1981	East central Minnesota; geologic map of Minnesota	SACN
	No Abstract			
264	Morton, J. D, Dodds, R. B.	1979	Ground subsidence associated with machine tunnelling in fluvio-deltaic sediments; Part 2; Tunnels Tunnelling	GRPO
	No Abstract			
265	Moss, C. M.	1979	Surficial and environmental geology of the western North Shore of Lake Superior; Geol Soc Am, Abstr Programs	GRPO
	No Abstract			
266	Moss, C. M.	1977	The surficial and environmental geology of the French River Quadrangle, St Louis County, Minnesota	SACN
	No Abstract			
267	Mossler, J. H.	1983	Bedrock topography and isopachs of Cretaceous and Quaternary strata, east-central and southeastern Minnesota; Miscellaneous Map Series (St Paul) M 52	APIS
	No Abstract			
268	Mossler, J. H, Olsen, B. M.	1979	Geologic sections and engineering characteristics of Quaternary units	MISS
	No Abstract			
269	Mossler, John H.	1989	Geologic atlas, Hennepin County, Minnesota; Geologic resources; County Atlas Series Minnesota Geological Survey	MISS
	No Abstract			
270	Mudrey, M. G. J, Brown, B. A.	1988	Summary of field mapping in the Superior map sheet; University of Wisconsin Extension Open file report	SACN
	No Abstract			
271	Mudrey, M. G. J, Weiblen, P. W.	1970	Geology of Pigeon point quadrangle, Cook county	GRPO
	No Abstract			
272	Mudrey, M. G. Jr	1978	Wisconsin's zinc-copper resources	SACN
	No Abstract			
273	Murray, Raymond C.	1955	Late Keweenawan or early Cambrian Glaciation in Upper Michigan; Bulletin of the Geological Society of America	ISRO
	No Abstract			
274	Myers, Wallace Darwin	1971	The sedimentology and tectonic significance of the Bayfield Group (Upper Keweenawan) Wisconsin and Minnesot	APIS
	The Bayfield Group (Lake Keweenawan?) crops cut as a clastic wedge along the Wisconsin shore of Lake Superior. The Bayfield outcrop belt is bounded to the south by the Douglas fault. The fault forms the northwest boundary of an uplifted block of Middle (?) Keweenawan volcanics known as the St. Croix horst. Geophysical evidence indicates that the Douglas fault is very steeply dipping at depth and possesses a throw in excess of 2000 feet. A study of the mineralogical and physical characteristics of the Bayfield Group was made to determine 1) depositional environment, paleogeography, and source terrane during Bayfield time, 2) the nature of the contact of the Bayfield Group with the older Oronto Group, and 3) the early history of the Douglas fault.			
275	Nagaraja, Rao C. R, Bradley, W. A.	1983	Effects of the El Chichon volcanic dust cloud on insolation measurements at Corvallis, Oregon (USA); Geophysical Research Letters	MISS
	No Abstract			

276	Need, Edward Adams	1980	Till stratigraphy and glacial history of Wisconsin's Lake Superior shoreline; Wisconsin Point to Bark River	SACN
	No Abstract			
277	Need, E. A, Johnson, M. D., Mickelson, D. M.	1981	Till stratigraphy and glacial history along the western shoreline of Wisconsin's Bayfield Peninsula; The Geological Society of America, North Central Section 15th annual meeting Abstracts with Programs Geological Society of America	APIS
	No Abstract			
278	Nelson, C. R, Petersen, D. L., Nelson, B. K.	1987	Tunnel construction in very weak sandstone	MISS
	No Abstract			
279	Nelson, C. R, Yardley, D. H.	1976	Modification of engineering properties of St Peter Sandstone; Inst Lake Super Geol, Tech Sess Abstr Field Guides	MISS
	No Abstract			
280	Norvitch, R. F, Walton, M. S.	1979	Geologic and hydrologic aspects of tunneling in the Twin Cities area, Minnesota; Miscellaneous Investigations Series U S Geological Survey	MISS
	No Abstract			
281	Nuhfer, Edward B, Dalles, Mary P.	1987	A guidebook to the geology of Lake Superior's Apostle Islands National Lakeshore (and nearby areas of the Bayfield Peninsula of Wisconsin)	APIS
	No Abstract			
282	Nuhfer, Edward B, Dalles, Mary P.	1994	Lake Superior's Apostle Islands National Lakeshore as a resource for geologic education	APIS
	No Abstract			
283	Nunn, J. A, Sleep, N. H.	1980	Thermal contraction and petroleum maturation in Michigan Basin; AAPG Bulletin	INDU
	No Abstract			
284	Ojakangas, R.W.	1968	Geologic map of greenstone belt, Rainy Lake, Minnesota	VOYA
	Overview map of rainy lake portions of Voyageurs National Park with various geologic features penciled in.			
285	Ojakangas, R.W.	1970	Geology of a greenstone belt In Minnesota: Rainy Lake to lake of the woods [abs]; Institute On Lake Superior Geology, Proceedings 16th Annual Meeting	VOYA
	No Abstract			
286	Ojakangas, Richard W., Match, Charles L.	1982	Minnesota's geology	GRPO, MISS, SACN, VOYA
	The book provides a background to general geologic principles and how geology has been studied in Minnesota. The main body of the work considers a timeline of the state's geology in detail. There are chapters on mineral resources and a look at regional geology in five sections. Included is an expansive bibliography and index.			
287	Ojakangas, R.W., Meineke, D.G., Listerud, W.H.	1977	Geology, sulfide mineralization, and geochemistry of the Birchdale-Indus area, Koochiching County, northwestern	VOYA
	No Abstract			
288	Ojakangas, R.W.; Sims, P.K., Morey, G.B.	1972	Rainy Lake area; geology of Minnesota: A Centennial Volume	VOYA
	No Abstract			

289	Olcott, P. G, Siegel, D. I.	1978	Physiography and surficial geology of the copper-nickel study region, northeastern Minnesota; Water Resources Investigations	SACN
	No Abstract			
290	Olsen, Bruce M, Bloomgren, Bruce A.	1989	Geologic atlas of Hennepin County, Minnesota; Bedrock geology; County Atlas Series Minnesota Geological Survey	MISS
	No Abstract			
291	Olson, Eric	1987	Before the glaciers: The pre-glacial geology of the upper St. Croix	SACN
	The report focuses on the importance of pre-glacial rock formations in today's geology of the area and discusses exposed pre-glacial bedrock and subsurface formations that affect surface features throughout the St. Croix watershed.			
292	Olson, Kurt Nathaniel	1981	Assessment of Upper Mississippi River floodplain changes with sequential aerial photography	MISS
	No Abstract			
293	O'Neill, Maggie Orr	1937	Early history of the Friendly Valley and Falls of the St Croix	SACN
	Early history of Chisago County, Minnesota and Polk County, Wisconsin, including the Dalles area around Taylors Falls.			
294	Pabian, R. K.	1980	Lake Superior agates; a historical review; Lapidary J	MISS
	No Abstract			
295	Paces, James B.	1988	Magmatic processes, evolution and mantle source characteristics contributing to the Petrogenesis of Midcontinent Rift basalts: Portage Lake Volcanics, Keweenaw Peninsula, Michigan	ISRO
	One of the primary purposes of this study is to investigate the geochemical and isotopic nature of the subcontinental upper mantle beneath the Superior Province craton. To accomplish this, Keweenawan-aged continental flood basalts from the Portage Lakes Volcanics are employed as geochemical remote sensors of their mantle source area. A major goal of this study is to determine the physical and geochemical nature of the mantle source that supplied oliviine tholeiite magmas to the 1.1 Ga rift, and then to relate this information and other Superior Province data to a physical and geochemical evolution model of the upper mantle underlying the North American craton. An additional goal of this study is to utilize geochemical data from the thick basalt pile to determine the processes involved in the generation and modification of Portage Lake Volcanics magmas.			
296	Parham, W. E.	1972	Nickel mining and the BWCA; a question of priorities; Minn Acad Sci, J	VOYA
	No Abstract			
297	Paull, Rachel Krebs	1977	Geology of Wisconsin and Upper Michigan	SACN
	This book provides a background for the state's geology. A pair of forechapters gives a general set of principles and history before a breakdown of each region is presented. The forechapters are followed by explanations of the minerals, rocks and fossils found within the region, and finally an overview of geological resources, a list of references, and a glossary complete the work.			
298	Paull, R. K, Paull, R. A.	1980	Field guide; Wisconsin and upper Michigan including parts of adjacent states; highway guide	SACN
	No Abstract			
299	Perry, Leslie A.	1986	Archeology along the St Croix Riverway, 1981	SACN
	The report describes a three-year archeological survey of the riverway that identified 217 sites within the National Scenic Riverway boundaries. The geology, hydrology, climate, and soils are described. A list of animal bones found at each site is included.			
300	Peterson, J. B, Goodrick, F. E., Melhorn, W. N.	1975	Delineation of the boundaries of a buried pre-glacial valley with Landsat-1 data; U S Natl Aeronaut Space Adm, Tech Memo griculture environment	INDU
	No Abstract			
301	Phillips, B. A. M.	1978	Coastal erosion, north and east shores of Lake Superior	SACN
	No Abstract			

302	Phinney, William C.	1963	Structure within the Duluth gabbro complex, Gabbro Lake and Greenwood Lake quadrangles, Lake County, Minnesota	SACN
	No Abstract			
303	Phinney, William C.	1969	The Duluth complex in the Gabbro Lake quadrangle, Minnesota; Minn Geol Surv, Rep Invest	SACN
	No Abstract			
304	Pincus, H. J.	1982	Criteria of structural geology and rock mechanics for the storage of heated compressed air in aquifers	SACN
	Studies have been in progress since 1977 to establish criteria for suitable sites for storage of compressed air in porous, permeable rocks, and to identify geological parameters to be mentioned in operating installations. At present, field tests are being undertaken to bridge the gap between laboratory and operating conditions. The types of traps successfully exploited in the oil and gas industry are technically attractive for the storage of compressed air. Clean quartz sandstones are the most promising reservoir rocks. Domed (anticlinal) models have been used in preliminary calculations and planning. For such a structure, the following minima have been proposed: closure, 10 m; aquifer thickness, 10 m; thickness of caprock, 6 m; depth, 200 m; porosity, 10 %; and permeability, 300 md. The most important independent and dependent variables are respectively rock type and permeability. The St. Peter Sandstone and the Mt. Simon Sandstone are good candidates for reservoir rock. Several areas in the north-central United States appear to have geological characteristics favorable to compressed air storage.			
305	Plummer, W. L, Marsden, R. W.	1979	The Mesabi Range trip; May 12, 1979	SACN
	No Abstract			
306	Poindexter, O. F., Martin, H. M., Bergquist, S. S.	1965	Rocks and minerals of Michigan; State of Michigan Geological Survey, Bulletin 2, Lansing	ISRO
	No Abstract			
307	Polloni, Christopher F, Brown, Carol L.	1992	The southern Lake Michigan coastal erosion study CD-ROM	INDU
	No Abstract			
308	Potter, Franklin C.	1952	Geological story of Isle Royale	ISRO
	Describes the igneous activity and glaciation that prepared Isle Royale. Describes physiography, geologic history, copper deposits, and types of rocks found on Isle Royale.			
309	Potzger, J. E.	1946	Phytosociology of the primeval forest in central-northern	ISRO
	No Abstract			
310	Poulsen, K. H.	1982	Archean tectonic evolution at a subprovince boundary, Rainy Lake, Ont	VOYA
	No Abstract			
311	Poulsen, K.H.	1984	The geological setting of mineralization in the Mine Centre-Fort Frances area district of Rainy River	VOYA
	This report constitutes a comprehensive description of the known mineralization in the Fort Frances-Mine Centre area of northwestern Ontario. The Archean rocks of the Wabigoon subprovince of northwestern Ontaio host several producing and post-producing deposits of iron, base metals, and gold. Most production has come from deposits near the subprovince margins and [this report] describe the nature and distribution of mineralization along the southwest margin at Rainy Lake where an abnormal concentration of various types of mineralization is present." (Excerpts from author’s introduction). Includes information on areas directly adjacent to Voyageurs National Park.			
312	Pratt, W. P, Erickson, R. L.,	1981	Methodology for mineral-resource appraisal, Rolla 2 degrees	APIS
	No Abstract			
313	Pray, L. C.	1976	The Thornton Reef (Silurian), northeastern Illinois; a 1976 revisitation	INDU
	No Abstract			

314	Prouty, C. E.	1980	Petroleum exploration and wrenching model, Michigan Basin; AAPG Bulletin	INDU
	No Abstract			
315	Pye, E. G.	1969	Geology and scenery on the North Shore of Lake Superior	ISRO
	No Abstract			
316	Raisanen, K.	1977	Isle Royale, Unit 4 - the geologic history of the Island	ISRO
	Presents information on the three basic types of rock and their presence on Isle Royale. Includes a brief history of the Lake Superior Basin and the landforms that rose from it. Discusses the effects of glaciation on the landforms.			
317	Rao, A. R, Padmanabhan, G.	1980	Time series modeling of Chicago particulates discussion; Journal of the Environmental Engineering Division	INDU
	No Abstract			
318	Rao, B. V.	1981	Petrogenesis of sulfides in the Dunka Road Cu-Ni deposit, Duluth Complex, Minnesota, with special reference to the role of contamination by country rock	SACN
	No Abstract			
319	Rao, B. V, Ripley, E. M.	1979	The relevance of H_2O in the generation of Cu-Ni sulfides in the Dunka Road Deposit, Duluth Complex, Minnesota; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
320	Raup, Henry A.	1966	The Sleeping Bear Dunes National Lakeshore; Natl Parks Mag	SLBE
	No Abstract			
321	Raymond, Randall E.	1975	Postglacial lakes and recent forest fire history as exhibited in inland lake sediments on Isle Royale National Park, Michigan	ISRO
	Study of the forest fire history of Isle Royale reveals that the inland lakes sampled for charcoal analysis have different origins with respect to the higher water levels of ancestral Lake Superior. Comparing the diagrams of the sediment sequences and the diagrams of the Isle Royale shoreline at the Miniong and Nipissing high water stages, makes it possible to separate those basins covered by only Lake Minong from those covered by both Lakes Minong and Nipissing. The record of charcoal influx to the lake sediments indicates that fire has been an important ecological factor in the forest history of ISRO for at least the past 1,000 years. The average frequency between peak periods of charcoal influx does not vary significantly in three of the four lakes selected for charcoal analysis. However, problems with radiocarbon age determinations and low rates of sediment accumulation make it difficult to say whether these peaks represent one fire or a series of fires at close time intervals.			
322	Reed, Robert C.	1987	Porcupine mountains wilderness state park, Michigan	APIS
	No Abstract			
323	Reinertsen, D. L.	1979	An introduction to the geology of the Evergreen Park-Thornton area, Cook County, Illinois	INDU
	No Abstract			
324	Reinertsen, D, Berggren, D.	1971	Geological science field trip; Palos Hills area; Cook and Du Page counties; Palos Park and Sag Bridge 75-minute quadrangles	INDU
	No Abstract			
325	Reinhard, C.	1979	Taylor County; Wisconsin cartographic catalog, 1979	SACN
	No Abstract			
326	Reinhard, C, Coles, G. L.	1983	Iron County, Wisconsin cartographic catalog 1983	APIS
	No Abstract			
327	Reshkin, Mark	1981	Geology and soils of the Indiana Dunes National Lakeshore; ecosystem study of the Indiana Dunes National Lakeshore	INDU

	This chapter on geology and soils of the Indiana Dunes National Lakeshore presents an extensive discussion of the stratigraphy, geomorphology, and geological history of the lakeshore region. Both the bedrock and the Quaternary (unconsolidated) earth materials are described. Coastal processes are presented as well as a geologic description, map and history of each lakeshore geographic unit. The soils of the lakeshore are mapped and described and the engineering uses of soils and geology data are summarized. Various maps and tables support the data and text. Appendices found in the 1975 report.			
328	Reshkin, Mark, Feldman, Herman, Kiefer, Wayne E., Krekeler, Carl H., Weber, Neil V.	1979	Basic ecosystem studies of the Indiana Dunes National Lakeshore	INDU
	This is an extension of the authors' earlier study on the lakeshore's soils, geology, land use classifications, settlement history, general climatology, aquatic biological communities, terrestrial biological communities and noise levels. Areas authorized for inclusion into the lakeshore are the focus of the present study, utilizing the same topics of study. Data is also mapped in an atlas format on "photo-map" bases. Land use maps and categories, and tables of noise levels are included.			
329	Reszka, C. R. Jr	1983	Part IV, oil and gas test well inventory; Prairie du Chien and deeper	INDU
	No Abstract			
330	Reynolds, R. L.	1979	Mineralogic residence of uranium in roll-type deposits; U S Geol Surv, Prof Pap	MISS
	No Abstract			
331	Reynolds, R. L, Goldhaber, M. B.	1978	Iron-titanium oxide minerals and associated alteration phases in some uranium-bearing sandstones; United States Geological SurveyJournal of Research of the	MISS
	No Abstract			
332	Richards, Jeremy P, Spooner, Edward T. C.	1989	Evidence for Cu-(Ag) mineralization by magmatic-meteoric fluid mixing in Keweenawan fissure veins, Mamainse Point, Ontario; Economic Geology and the Bulletin of the Society of Economic Geologists	SACN
	No Abstract			
333	Richter, D, Simmons, G.	1977	Microcracks in crustal igneous rocks; microscopy	APIS
	No Abstract			
334	Ridgway, J. R, Schroeder, W., Bermudez, A.	1982	A gravity profile over the Teays River valley, Indiana Ridgway	INDU
	No Abstract			
335	Rieck, R. L, Winters, H. A.	1980	Distribution and significance of glacially buried organic matter in Michigan's southern peninsula; Physical Geography	SLBE
	No Abstract			
336	Ripley, E. M.	1978	Sulfur isotopic studies of the Dunka Road Cu-Ni deposit, Duluth Complex, Minnesota; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
337	Ripley, Edward M, Taib, Nur Iskandar	1989	Carbon isotopic studies of metasedimentary and igneous rocks at the Babbitt Cu-Ni deposit, Duluth Complex, Minnesota, USA; Chemical Geology; Isotope Geoscience Section	VOYA
	No Abstract			

338	Rittschof, William F.	1976	Coastal geologic engineering parameters relative to docking designs, Little Sand Bay, Apostle Islands National lake shore park, Wisconsin	APIS
	No Abstract			
339	Rivett, A. S, MacTavish, A. D.	1980	Bliss Lake area, District of Kenora; Preliminary map; Kenora data series	VOYA
	No Abstract			
340	Rivett, A. S, MacTavish, A. D.	1980	Dobie Township area, District of Rainy River; preliminary map; Kenora data series	VOYA
	No Abstract			
341	Rivett, S, Mac, Tavish A. D.	1980	Grassy Portage Bay-Rainy Lake area, District of Rainy River; Preliminary map; Kenora data series	VOYA
	No Abstract			
342	Roed, M. A.	1980	Rainy Lake area (NTS 52C/NW), District of Rainy River; Northern Ontario Engineering Geology Terrain Study	VOYA
	No Abstract			
343	Roed, M. A.	1980	Sand Point Lake area (NTS 52C/SE), district of Rainy River; Northern Ontario Engineering Geology Terrain Study	VOYA
	No Abstract			
344	Rose, Robert	1997	Overview of Cambrian sandstone environments of deposition; Pictured Rocks resource report	PIRO
	The bedrock geology of Pictured Rocks National Lakeshore, MI, is reviewed and reinterpreted. The origins of the Jacobsville Formation, the Munising Formation, and the Au Train Formation, which compose the shoreline cliffs, are described. The Cambrian Era environments in which these sandstones were formed are depicted. Mud cracks, ripple marks, and trace fossils are discussed. Profiles illustrate the sandstone bedrock column and visible portions of the cliff face that can be observed at various places along the lakeshore.			
345	Rose, William I.	1987	Field trip to the Keweenaw rift: lava flows and copper	ISRO
	Videotape of Dr. Rose's narrative while leading a field trip on Isle Royale as part of the Isle Royale Natural History Association annual meeting. This presentation includes a discussion of the geology of Isle Royale; lava flows and the presence of copper on Isle Royale are specific topics.			
346	Rose, William I.	1994	Institute on Lake Superior geology proceedings, 40th Annual Meeting, May 11-14, 1994 Volume 40, Part 3 - volcanic geology of eastern Isle Royale, Michigan	ISRO
	A guidebook meant to be used with "The Geologic Story of Isle Royale National Park" by N. King Huber. This guidebook focuses on the volcanic geology that can be observed in the wave-washed shorelines of the Rock Harbor area, emphasizing the physical volcanology of basaltic lava flows.			
347	Rose, William I., Wunderman, Richard, Schmidt, Suzanne	1996	1996 investigators annual report: geological exploration of Passage Island	ISRO
	The objective of this study is to map the island geologically and evaluate the significance of exposures of the Greenstone flow for researchers interested in the solidification of large lava flows. Findings are presented.			

348	Routledge, R. E, Parrish, I. S., Leigh, O. E.	1981	Rice Lake Quadrangle, Wisconsin	SACN
	Uranium resources of the Rice Lake Quadrangle, Wisconsin, were evaluated using National Uranium Resource Evaluation criteria. Extensive and locally thick glacial debris mantles much of the Precambrian and Upper Cambrian sandstone bed rock; the lithostructural character of bed rock is conceptual and taken from limited diamond drilling and interpretation of regional gravity and aerial magnetic survey data. Evaluation was largely from interpretation of hydrogeochemical and stream-sediment and aerial radiometric reconnaissance survey data. Supplementary lake-sediment and rock sampling, and additional stream-sediment and ground-water sampling, were done. No significant geochemical or aerial radiometric anomalies were defined. Two areas are favorable for unconformity-related uranium deposits, based on empirical lithologic and structural recognition criteria; the environment is the regional unconformity between Precambrian Y Barron Quartzite and Precambrian X metasedimentary basement rocks. No uranium occurrences were found in the Rice Lake Quadrangle, and none are reported in the literature.			
349	Routledge, R. E, Parrish, I. S., Leigh, O. E.	1982	Ashland Quadrangle, Wisconsin, Michigan, and Minnesota	APIS
	Favorability for uranium occurrences in geologic environments of the Ashland Quadrangle was evaluated by surface and subsurface investigations. The quadrangle is characterized by extensive and locally thick accumulations of glacial debris; however, more than 200 outcrops were examined, and many of these were sampled. Sand and gravel quarries, as well as many boulders and exposed glacial tills, were examined. No uranium occurrences were found, and none are reported in the literature. Areas of slightly anomalous radioactivity interpreted from an aerial radiometric survey and geochemical anomalies interpreted from a hydrogeochemical and stream-sediment reconnaissance survey were investigated. The methods used were stream-sediment, well-water, and stream-water sampling, as well as radiometric surveying. Supplementary geochemical data were acquired through lake-sediment sampling. Only low-order anomalies were found. More than 65,000 ft of drill core were radiometrically logged, and 35 line km (21.7 line mi) of radon soil-gas surveys were performed to obtain subsurface information.--Modified from report abstract.			
350	Saarnisto, Matti	1974	The deglaciation history of the Lake Superior region and its climatic implications; Quaternary Research	ISRO
	No Abstract			
351	Saarnisto, Matti	1975	Stratigraphical studies on the shoreline displacement of Lake Superior; Canadian Journal of Earth Science	ISRO
	Shoreline displacement in the Lake Superior basin was followed, independently of morphological data, by studying sediments of small lake basins at different elevations in the vicinity of Sault Saint Marie, Wawa, and Marathon, Ontario. Emergence of small lakes, resulting from water level changes in the main basin, is documented in bottom sediments, and can be dated by radiocarbon and pollen analyses. The new stratigraphical findings were correlated with the earlier established morphological shorelines, and thus the Late Wisconsinan and Holocene history of lake levels was worked out.			
352	Sansome, Constance Jefferson	1983	Minnesota underfoot: a field guide to the state's outstanding geologic features	SACN
	Describes geologic features in the state, including the Dalles of the St. Croix, features near Taylors Falls and Curtis Falls.			
353	Schmidt, Susanne, Rose, William	1996	1996 investigators annual report: alteration and fluid flow in lava flows of Isle Royale National Park	ISRO
	This project investigates the physico-chemical conditions of low temperature formation which affected the lava flows of the Midcontinent Rift System of the Lake Superior Region. Characteristic metamorphic assemblages can be used to deduce the formation temperatures. Stable isotope investigation of quartz and calcite provides information about the composition of the altering fluid. This new technique combined with classical analytical techniques allows characterization of the nature of the fluid as well as a more detailed understanding of the alteration process in the veins and the lava flows of Isle Royale. Findings to data are included.			
354	Schneider, Allan F, Keller, Stanley J.	1970	Geologic map of the 1 degrees x 2 degrees Chicago quadrangle, Indiana, Illinois, and Michigan, showing bedrock and unconsolidated deposits	INDU
	No Abstract			
355	Schnieders, B. R, McConnell, C. D.	1981	Flanders area, Rainy River district; preliminary maps	VOYA
	No Abstract			

356	Schnieders, B. R, McConnell, C. D.	1981	McQuat Lake area, Rainy River district; preliminary maps	VOYA
	No Abstract			
357	Schultink, G.	1978	The application of remote sensing techniques for the enforcement of the Michigan Sand Dune Management and Protection Act	INDU
	No Abstract			
358	Schwenk, C. G.	1977	Discovery of the Flambeau deposit, Rusk County, Wisconsin; a geophysical case history; Geosci Wis	SACN
	No Abstract			
359	Schwerdtner, W. M.	1984	Archaean gneiss domes in the Wabigoon Subprovince of the Canadian Shield, northwestern Ontario	VOYA
	No Abstract			
360	Schwerdtner, W. M, Sutcliffe, R. H., Troeng, B.	1978	Patterns of total strain in the crestal region of immature diapirs; Can J Earth Sci	VOYA
	No Abstract			
361	Shabica, Charles W, Pranschke, Frank A., Chrzastowski, Michael J.	1992	Sediment entrapment by coastal structures along the Illinois shore of Lake Michigan	INDU
	No Abstract			
362	Shands, J. A, Monkmeyer, P. L., Edil, T. B.	1978	Shore protection demonstration project on Lake Superior	APIS
	No Abstract			
363	Sims, P. K.	1989	Geologic map of Precambrian rocks of Rice Lake 1 degrees X 2 degrees Quadrangle, northern Wisconsin; Miscellaneous Investigations Series US Geological Survey	SACN
	No Abstract			
364	Sims, P. K.	1990	Geologic map of Precambrian rock of Neillsville-Stevens Point area, central Wisconsin; Miscellaneous Investigations Series US Geological Survey	SACN
	No Abstract			
365	Sims, P. K, Cannon, W. F., Mudrey, M. G. Jr	1978	Preliminary geologic map of Precambrian rocks in part of northern Wisconsin; U S Geological Survey Open file report	MISS
	No Abstract			
366	Smith, A. T, Zack, P. E.	1981	A study of Lake Chicago Calumet beach sediments	INDU
	No Abstract			
367	Smith, B. D. investigator	No Date	Mineral geophysical surveys in Wisconsin and Michigan; Geological Survey Professional Paper (Washington, DC)	INDU
	No Abstract			
368	Southwick, D. L.	1976	High-grade metamorphism associated with the Vermillion Batholith, Minnesota-Ontario; Institute On Lake Superior Geology, 22nd Annual Meeting	VOYA
	No Abstract			

369	Southwick, D. L, Morey, G. B.	1988	Tectonic imbrication and foredeep in the Penokean Orogen, east-central Minnesota; Institute of Lake Superior Geology, 34th annual meeting; proceedings and abstracts Proceedings and Abstracts Institute on Lake Superior Geology, Annual Meeting	SACN
	No Abstract			
370	Southwick, D. L, Morey, G. B., McSwiggen, Peter L.	1988	Geologic map (scale 1:250,000) of the Penokean Orogen, central and eastern Minnesota, and accompanying text; report of investigations Minnesota Geological Survey	SACN
	No Abstract			
371	Southwick, D. L, Ojakangas, R. W.	1979	Vermilion greenstone belt	SACN
	No Abstract			
372	Southwick, D. L, Ojakangas, R. W.	1979	Geologic map of Minnesota, International Falls sheet; bedrock geology	VOYA
	No Abstract			
373	Southwick, D. L, Ojakangas, R. W., Bauer, R. L.	1979	Rainy Lake greenstone belt and Vermilion granitic complex	SACN
	No Abstract			
374	Stanley, George M.	1932	Abandoned strands of Isle Royale and Northeastern Lake Superior	ISRO
	Forms the basic knowledge concerning Isle Royale's ancient beach lines and Lake Superior's ancient lake levels, and correlates this information with similar findings in Canada and other areas.			
375	State Of Indiana, Department Of Natural Resources	1974	The Indiana Dunes - legacy of sand	INDU
	This report provides a geologic overview of the Indiana Dunes National Lakeshore. It begins with a glacial history of the area, with emphasis on "glacial Lake Chicago". Shoreline processes are described for the National Lakeshore area, with photographs of various portions of shoreline in the park and a discussion of shoreline erosion. The sand dunes are then described, with various terms associated with dune formation defined. The vegetative sequence from the shore inland is also outlined, and there is a section describing the phenomenon of "squeaking sand" at the park's beaches. A short description of Pinhook Bog concludes the report. A glossary of terms used to define the natural resources and their formation at the Indiana dunes is included, with a map showing generalized surficial geology and numbered localities.			
376	Sterling, R. L, Nelson, C. R., Yardley, D. H.	1978	Mined space in the Twin Cities geology	MISS
	No Abstract			
377	Stevens, Lora	1989	Fracture analysis of the pipestone trace Boundary Waters Canoe Wilderness Area, Minnesota	APIS
	No Abstract			
378	Stevenson, Robert James	1982	Amphiboles at the base of the Duluth Complex, Minnesota	SACN
	No Abstract			
379	Sun, A. Y, Craddock, J. C.	1983	Structural patterns in the Precambrian rocks east of Eau Claire, Wisconsin	SACN
	No Abstract			
380	Sundeen, S. P.	1978	Geological study of the sand deposits of Michigan, Phase II;	PIRO
	No Abstract			

381	Tabet, D. E, Mangham, J. R.	1978	The geology of the eastern Mellen intrusive complex, Wisconsin; Geosci Wis	APIS
	No Abstract			
382	Taylor, F. B.	1895	Nipissing beach on the North Superior shore; American Geol	ISRO
	No Abstract			
383	Taylor, F. B.	1897	Notes on the abandoned beaches of the north coast of Lake Superior; Amer Geol	ISRO
	No Abstract			
384	Taylor, L. D.	1983	Clay mineral composition and magnetic susceptibility in the correlation of late Wisconsinan tills of the western Michigan shoreline	INDU
	No Abstract			
385	Thomas, John	1959	Geology of the Cloquet area, northeastern Minnesota	SACN
	No Abstract			
386	Thompson, Todd A.	1985	Late Pleistocene lacustrine sediments of the Cowles Bog area, Indiana Dunes National Lakeshore; The Geological Society of America, North Central Section, 19th annual meeting Abstracts with Programs Geological Society of America	INDU
	No Abstract			
387	Thompson, Todd A.	1989	Shoreline behavior in the Indiana Dunes and the scale of lake-level fluctuation	INDU
	No Abstract			
388	Thompson, Todd A.	1990	Dune and beach complex and back-barrier sediments along the southeastern shore of Lake Michigan; Cowles Bog area of the Indiana Dunes National Lakeshore	INDU
	No Abstract			
389	Thompson, Todd A.; Wilcox, Douglas A., Hiebert, Ronald D., Wood, James D., Jr.	1986	Development of the late Wisconsin to early Holocene Calumet and Toleston dune/beach complexes in the Indiana Dunes National Lakeshore; Proceedings of the first Indiana Dunes research conference: Symposium on shoreline processes	INDU
	The paper briefly describes the types of deposits associated with the transgressional events from the Two Creeks and Chippewa low phases and the Calumet and Toleston dune/beach complexes in the Indiana Dunes National Lakeshore. Possible reasons for their differences are also explored. Vibracores were collected, described, sampled, and photographed at various locations within the study area. Cross sections show deposits for the complexes. Conclusions regarding the formations of the study area are drawn.			
390	31.5	1912	Sandstones of the Wisconsin coast of Lake Superior; Wisconsin Geological and Natural History Survey	APIS
	This article provided a brief description of the geology of the Apostle Islands. The present islands range in size from Madeline, twelve and one-half miles in length, to mere rocks, like Little Manitou. They vary in height which is barely above the storm waves, to an elevation of 480 feet on Oak Island. Outer, Stockton, and Bear Islands are the only others to exceed 100 feet in altitude, most being flat and low. The higher ones are terraces by abandoned beaches, none of which, so far as known, exposes any rock.			
391	Tremper, Charles W.	1989	Aerial photo lineament analysis of a portion of the Burntside Lake fault zone, Boundary Waters canoe area, northern Minnesota, and Quetico Provincial Park, southern Ontario	VOYA
	No Abstract			
392	Turcotte, D. L.	1979	Models for evolution of interior basins; Am Assoc Pet Geol, Bull	INDU
	No Abstract			

393	U.S. Bureau Of Mines	No Date	Regional geology - Voyageurs National Park	VOYA
	Schematic map showing the various rock types found in Voyageurs National Park.			
394	Vadis, M. K, Meineke, D. G.	1977	Geophysical and geochemical surveys, Skeleton Lake area, St Louis County, Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	SACN
	No Abstract			
395	Vallejo, L. E.	1977	Mechanics of the stability and development of the Great Lakes coastal bluffs	INDU
	No Abstract			
396	Vanderpoel, P. director	No Date	Major peat resources in Minnesota	SACN, VOYA
	No Abstract			
397	Vogler, E. A, Meyers, P. A., Moore, W. E.	1980	Isotopic and molecular comparisons of three Michigan Basin crude oils; Geol Soc Am, Abstr Programs	INDU
	No Abstract			
398	Voyageurs National Park	No Date	Geology of the Voyageurs National Park area	VOYA
	Assortment of xeroxed pages and diagrams containing information of the geology and geologic history of the area within and surrounding Voyageurs National Park. This collection is not organized in any recognizable form, and many of the sources of the information are unidentifiable, but there is a lot of pertinent information. See biologist Lee Grim for further direction.			
399	Wallace, H.	1981	Keweenawan geology of the Lake Superior basin	MISS
	No Abstract			
400	Wallbom, Todd E., Larson, Grahame J.	1998	Surficial geology of the Glen Have, Glen Arbor, Good Harbor Bay, Empire, Burdickville, and Beulah 75 Minute Quadrangles, Leelanau and Benzie Counties, Michigan	SLBE
	A color coded map depicts the surficial geology of the Sleeping Bear Dunes National Lakeshore, MI and surrounding townships. Cross-sectional maps also illustrate surface and sub-surface deposits of the regions between Empire Bluffs and Pearl Lake, Sleeping Bear Bluffs and Sleeping Bear Bay, and the Sugarloaf Mountain area.			
401	Walton, M.	1978	Engineering geology of the Twin Cities central urban area, Minnesota; Geol Soc Am, Abstr Programs	SACN
	No Abstract			
402	Walton, M.	1979	The geologic terranes of Minnesota	SACN
	No Abstract			
403	Watowich, S. N.	1978	A preliminary geological view of the Minnamax copper-nickel deposit in the Duluth Gabbro at the Minnamax Project	APIS
	No Abstract			
404	Webb, W. W. III	1976	Observations on the habit and nature of emplacement of copper and nickel sulphides in the Duluth Complex, northern Minnesota	SACN
	No Abstract			
405	Wedow, H. investigato, Large, D. investigator, Klau, W. investigator, Wynn, J. C. investigator	No Date	USGS-BGR cooperation; Geological Survey Professional Paper (Washington, DC)	INDU
	No Abstract			
406	Weiblen, P. W, Cooper, R. J., Churchill, R. K.	1977	Relationship between mineralization and structure in the Duluth Complex; Geol Soc Am, Abstr Programs	SACN
	No Abstract			

407	Weiblen, P. W.	1982	Field trip guidebook for the Precambrian terrane of the Minnesota River valley; Guidebook Series Minnesota Geological Survey	MISS
	No Abstract			
408	Weisbrod, A.R., Turner, J.G.	1990	Erosion survey of the St Croix National Wild and Scenic Riverway	SACN
	Unpublished report from a field survey of erosion along the St. Croix Riverway, completed in 1990.			
409	West Central Wisconsin Regional Planning Commission	1988	St Croix County soil erosion control plan	SACN
	Outlines an erosion control plan for the county			
410	White, Walter S.	1952	Imbrication and initial dip in a Keweenawan conglomerate bed; Journal of Sed Petr	ISRO
	No Abstract			
411	White, Walter S.	1960	The Keweenawan lavas of Lake Superior, an example of flood basalts; American Journal of Science	ISRO
	Citation found in "Bibliography of Lake Superior National Park System Areas" by Robert Linn, 1980. Provides the rationale behind the interpretation of the Portage Lake Volcanics as flood basalts.			
412	White, Walter S.	1966	Tectonics of the Keweenawan Basin, Western Lake Superior region	ISRO
	No Abstract			
413	White, Walter S.	1971	Guidebook for field conference, Michigan copper district, Sept 30-Oct 2, 1971	APIS
	No Abstract			
414	White, Walter S.	1971	Geologic setting of the Michigan copper district	APIS
	No Abstract			
415	White, Walter S.	1978	A theoretical basis for exploration for native copper in northern Wisconsin; U S Geological Survey Circular	SACN
	No Abstract			
416	White, Walter S., Wright, James C.	1960	Lithofacies of the Copper Harbor conglomerate, Northern Michigan; Geological Survey Research for 1960 U S Geological Survey Professional Paper Number 400-B	ISRO
	No Abstract			
417	Whitney, Josiah Dwight	1847	Description and analysis of three minerals from Lake Superior; Boston Journal of Natural History	ISRO
	No Abstract			
418	Whitney, Josiah Dwight	1848	Chlorastrolite from Isle Royale, Lake Superior; proceedings of the Boston Society of Natural History	ISRO
	No Abstract			
419	Williams, Ian S.	1989	Summary of the midcontinent rift system in the lower St Croix Valley	SACN
	No Abstract			

420	Williams, Sidney A.	1957	A study of chlorastrolite	ISRO
	The purpose of this thesis is to describe the physical and chemical characteristics of chlorastrolite and to determine whether or not it is a mixture. Concluded that thomsonite, prehnite, mesolite and delessite are not closely related to or identical with chlorastrolite. Chlorastrolite is a distinct mineral species; it is not a mixture. Zonochlorite has been shown to be identical with chlorastrolite. The relations between pumpellyite and chloratrolite are somewhat obscure, but it seems probable that they are closely related. Thesis has a map showing chlorastrolite and thomsonite locations on Isle Royale.			
421	Winchell, Newton H.	1881	Minnesota geological and natural history survey, Ninth Annual Report for 1880	ISRO
	No Abstract			
422	Winchell, Newton H.	1882	The geological and natural history survey of Minnesota, Tenth Annual Report, 1881	ISRO
	No Abstract			
423	Witthuhn, Kathleen Marilyn	1993	A structural analysis of the midcontinent rift in Michigan, based on a fault array analysis utilizing slickensides	ISRO
	Examination of nearly 600 small scale fault structures on both of the synclinal limbs along a transect northwest across the Lake Superior syncline, from the Keweenaw Peninsula to Isle Royale in Michigan, was successful in isolating two consistent stress fields for each limb of the syncline, that would satisfy criteria for opening and closing of the Midcontinent Rift System.			
424	Wold, R. J.	1967	Geophysical study of Lake Superior; proceedings of the 10th Conference on Great Lakes Research	ISRO
	No Abstract			
425	Wold, R. J, Berkson, J.	1979	Gravity study of Lake Superior; Geol Soc Am, Abstr Programs	VOYA
	No Abstract			
426	Wold, R. J., Hutchinson, D. R., Johnson, T. C., R. J. Wold And W. J. Hinze	1981	Topography and surficial structure of Lake Superior bedrock based on seismic reflection profiles tectonic history of Lake Superior basin: a review	ISRO
	No Abstract			
427	Wold, R. J., Ostenso, N. A.	1966	Aeromagnetic, gravity and sub-bottom profiling studies in western Lake Superior; IN: Steinhart, J S and T J Smith, eds The Earth Beneath the Continents - A volume of geophysical studies in honor of Merle A Tuve American Geophysical Union, Geophysical Monograph No 10:66-94 NAS/NRC Publication No 1467	ISRO
	No Abstract			
428	Wolff, Roger Gene	1969	Upper Keweenawan sedimentary rocks on Isle Royale, Lake Superior	ISRO
	The Upper Keweenawan sedimentary rocks on Isle Royale (Isle Royale Conglomerate) have been studied in order to better understand their nature and origin, their comparison to the Copper Harbor Conglomerate, and their significance in the Keweenawan province. In this study all known outcrops of the Isle Royale Conglomerate were mapped, and a part of the formation was measured and described. From field and laboratory evidence an attempt was made to determine the direction and agenet of sedimentary transport, the direction and composition of the source terrance, and the environment of sedimentary accumulation.			
429	Wood, J, Dekker, J., Jansen, J. G., Keay, J. P., Panagapko, D.	1980	Mine Centre area (eastern half), district of Rainy River; preliminary map; geological series	VOYA
	No Abstract			
430	Wood, J, Dekker, J., Jansen, J. G., Keay, J. P., Panagapko, D.	1980	Mine Centre area (western half), district of Rainy River; preliminary map; geological series	VOYA
	No Abstract			

431	Wood, S.	1978	Characterization of the uranium occurrence in pre- and post-leach ore samples from sandstone deposits in Texas and Wyoming; Soc Pet Eng AIME, Annu Fall Tech Conf Exhib, Pap	MISS
	No Abstract			
432	Wood, S.	1980	Characterization of the uranium occurrence in pre- and post-leach ore samples from sandstone deposits in Texas & Wyoming; In Situ	MISS
	No Abstract			
433	Wood, W. L.	1978	An introduction to shoreline problems of the southern shore of Lake Michigan	INDU
	No Abstract			
434	Wood, W.L., Davis, S.E.	1986	Indiana Dunes National Lakeshore shoreline situation report	INDU
	The report presents a complete data base on and assessment of the shoreline and adjacent nearshore area within the Indiana Dunes National Lakeshore. Coastal processes are emphasized as they relate to historic and contemporary erosion. Changes of the shoreline, bluff top, nearshore sand bars, and dune vegetation are described. A physical description of the area is included, followed by sections on coastal processes and responses, coastal structures, the shoreline situation on reaches 1-3, and beach and nearshore profile changes. Maps, charts, and graphs accompany the text.			
435	Wood, W. L, Weishar, L. L.	1985	Beach response to long period lake-level variation	INDU
	No Abstract			
436	Woodard, Henry H, Weaver, Stephen G.	1989	Geology of archean rocks, Basswood Lake-Crooked Lake region, northern Minnesota-southern Canada	VOYA
	No Abstract			
437	Woodward, D. G.	1985	Seismic-refraction study of suspected drift-filled bedrock valleys in Ramsey County, Minnesota; Water Resources Investigations	MISS
	No Abstract			
438	Wovcha, Daniel S., Delaney, Barbara C., Nordquist, Gerda E.	1995	Minnesota's St. Croix River Valley and Anoka sandplain: A guide to native habitats	SACN
	An excellent guide to the natural environment of the lower 80 miles of the St. Croix River Valley. Provided is a landscape history (geology, glacial, vegetation patterns, human influence), and an inventory of the native habitats and natural communities. The guide also suggests sites within the 1.5 million acres of the St. Croix River Valley and Anoka sandplains to visit. The descriptions include photographs, diagrams, maps, and fact sheets of each habitat type and location. Cover flaps contain vegetation type maps, and the book has an extensive glossary and bibliography.			
439	Wright, H. E. J, Glaser, P. H.	1982	Postglacial peatlands of northern Minnesota	VOYA
	No Abstract			
440	Wright, H. E. Jr.	1973	Tunnel valleys, glacial surges, and sub-glacial hydrology of the Superior Lobe, Minnesota	ISRO
	No Abstract			
441	Zarth, R. J.	1977	The Quaternary geology of the Wrenshall and Frogner quadrangles, northeastern Minnesota	SACN
	No Abstract			
442	Zellie, Carole	1989	Geographic features and landscape change at Saint Anthony Falls	MISS
	The report provides an overview of the geologic and landscape features of St. Anthony Falls in Minneapolis. Beginning with the last glacial events in the area, the falls are the most impressive on the river. The geologic features of the area are described and past explorations of the falls are examined. Historic maps, pictures, and photos are included.			

443	Zumberge, James H.	1955	Glacial erosion in tilted rock layers; The Journal of Geology	ISRO
	Isle Royale in Lake Superior and the Rove area of northeastern Minnesota have valley and ridge topographies controlled by bands of massive, poorly jointed rock, alternating with highly jointed rock units. The last Wisconsin ice crossed the Rove area at right angles to the regional strike but invaded Isle Royale, moving parallel to the regional strike. In spite of this one difference in geomorphic history, the resultant terrains are nearly the same in appearance. This leads the writer to conclude that the direction of ice movement with respect to preglacial valleys is of little or no importance in the glacial quarrying process but that the structural and lithologic elements of the preglacial terrain are far more potent in controlling the course of glacial denudation. Factors controlling the process of glacial denudation are divided into two categories: (1) the applied force and (2) the resisting force. Glacial abrasion is controlled primarily by factors of the applied force, such as ice thickness, velocity and direction of flow, and amount and kind of debris in the basal ice. Glacial quarrying is controlled primarily by factors of the resisting force, especially structural and lithologic elements.			
444	Zumberge, J. H., Gast, P.	1961	Geological investigations in Lake Superior; Geo Times	ISRO
	No Abstract			

HERPTILES

1	Anderson, R. K., Milfred, C. J., Fraundorf, W. J., Kraft, G.	1979	Basic ecological study of Outer Island at Apostle Islands National Lakeshore	APIS
	This report presents the results of study of Outer Island, Apostle Islands National Lakeshore. The objectives of the study were: (1) prepare a soil map and evaluate the soil characteristics and landforms of Outer Island; (2) describe profiles of dominant soil series, collect samples, and analyze the samples for bulk density, particle size distribution, cation exchange capacity, exchangeable cations, pH, carbonates and spodic horizon analysis; (3) relate soil properties to suitability for recreational use and prepare a map showing areas most suitable for use; (4) collect and analyze water samples from the headwaters and outlets of the larger streams on Outer Island, the lagoon and Lake Superior; (5) inventory and analyze plant and animal communities; (6) investigate beaver ecology and harvest potential; (7) determine the human-use sensitivity of the sand spit and lagoon area; (8) identify a north-south trail route over the island, and the location of potential primitive campsites.			
2	Anderson, R. K., Milfred, C. J., Stowell, L. R., Fisher, S.	1982	Basic ecological and recreational resources inventory of Sand Island at Apostle Islands National Lakeshore	APIS
	This report presents the results of a study of Sand Island and Eagle Island in the Apostle Islands National Lakeshore. The study objectives for Sand Island were to: identify soil series present and map the soils; develop soil interpretations for recreational use; identify points of interest to visitors; locate areas suitable for campsites; examine existing trails to determine their suitability for use by visitors; select and map suitable routes for proposed trails; analyze the vegetation; inventory the mammal, amphibian, reptilian, and avian populations; and investigate reasons for the absence of whitetail deer. The study objective for Eagle Island was to determine productivity of blue heron (*Ardea herodias*), herring gull (*Larus argentatus*), and double-crested cormorant (*Phalacrocorax auritus*).			
3	Anoka County Parks and Recreation Department, Twin Cities Metropolitan Council, Minneapolis Park and Recreation Board, Suburban	1986	Final north Mississippi Regional Park study/master plan	MISS
	The report contains the plans for the proposed development of the North Mississippi Regional Park in Brooklyn Center, MN. Regulations affecting the development of the park are outlined and the resources in the area are described. The report was released prior to the designation of the Mississippi National River and Recreation Area.			
4	author unknown	1935	The Chicago Academy of Sciences - the dunes of the Chicago region	INDU
	This publication includes several short articles on the "Dunes of the Chicago Region". There is a brief introduction to the sand dunes of the Chicago region, which encompasses what is now the Indiana Dunes National Lakeshore, followed by seven related articles. The first, "Dune Successions" by Verne O. Graham, gives a overview of vegetation patterns at or near the dunes. "Wild Flowers" by Verne O. Graham, distinguishes various flower habitats existing at the dunes, and species within those habitats. "Reptiles and Amphibians of the Dunes" by Walter L. Necker briefly examines the most common species found in the dunes. Edwin V. Komarek's article on "Mammals of the Indiana Dunes", which explores the common mammals of the area, and the type of habitat where they might be found. "The Invertebrate Life of the Indiana Dunes" is explored by Donald C. Lowrie, followed by Norman Bergendahl's article on "Indian Artifacts from the Dunes". "Reminiscences of Birds of the Dune Country" by Edward R. Ford indicates birds of the area as seen by the author. All of the articles reflect the authors' personal experiences from the Indiana Dunes.			
5	author unknown	1989	Herpetalogical specimens	SACN
	Printout of all herpetalogical specimens in the Milwaukee Public Museum collection that involve the St. Croix or the Namekagon Rivers in Wisconsin counties.			
6	author unknown	1995	Amphibian list for Indiana Dunes National Lakeshore; National Park Service and National Biological Survey	INDU
	This list indicates the presence, documentation, resident status, and abundance of amphibians at the park. The order, family, Latin name, and common name are given for each amphibian.			

7	Bailey, Michael E.; Paddock, Mark W.	1975	Fauna of the Manitou Islands; natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	SLBE
	Lists all amphibians, reptiles, and mammals found on South Manitou Island, on North Manitou Island, and on the mainland of Sleeping Bear Dunes National Lakeshore. Discusses how the islands became colonized and has tables noting how each species is believed to have reached the islands: via ice bridge, swimming, flying, introduced by humans, or uncertain means. The scientific name and common name(s) are given for each species.			
8	Bonestroo Rosene Anderlik & Associates	1997	West draw study area alternative urban areawide review (AUAR)	MISS
	The AUAR was prepared in lieu of an Environmental Assessment Worksheet (EAW) or an Environmental Impact Statement (EIS) for an area in Coon Rapids, MN slated for development. The area lies near, but not within the Mississippi National River and Recreation Area.			
9	Breckenridge, Walter J.	1944	Reptiles and amphibians of Minnesota	SACN
	This work contains species identification, life histories, abundance and distribution for reptiles and amphibians in Minnesota. It provides information on species rare or in peril. Habitat and ecology are discussed for each species.			
10	Breden, Felix	1982	Population structure and ecology of the Fowler's toad, *Bufo Woodhousei Fowleri* , in the Indiana Dunes National Lakeshore	INDU
	This is an initial report on the study of the population ecology and genetic structure of the Fowler's Toad (*Bufo woodhousei fowleri*) at the Indiana Dunes National Lakeshore. The sizes and productivities of the breeding populations and the dispersal patterns of the toads is quantified. These parameters are analyzed using electrophoresis of proteins of tissue samples. A summary and conclusion provides results at the time of the initial study.			
11	Breden, Felix	1988	Natural history and ecology of Fowler's toad, *Bufo woodhousei fowleri* (Amphibia: Bufonidae), in the Indiana Dunes National Lakeshore; Zoology	INDU
	This paper examines the ecology and natural history of a restricted population of Fowler's toad (*Bufo woodhousei fowleri*) found in the Indiana Dunes National Lakeshore. A brief segment on amphibian natural history is given, followed by an explanation of the specific study population and its habitat at West Beach in the national lakeshore. The materials, methods, and results of the four-year mark-recapture study are provided, along with a discussion of seasonal activity patterns, age-specific dispersal patterns, postmetamorphic growth rate and age at sexual maturity, sex ratios, and population size and survivorship. Tables and figures supporting the data are provided.			
12	Brown, Robert T.	1976	Tentative checklists of amphibians, reptiles, mammals, birds, and vascular plants observed on Raspberry, Rocky, York, and Bear Islands	APIS
	This report includes the status of work completed on the basic ecological factors of four islands (Raspberry, Rocky, York, Bear) within Apostle Islands National Lakeshore. Included are tentative checklists for these islands of: amphibians, reptiles, mammals, birds, and vascular plants.			
13	Case, David J., Scharf, William C.	1985	Additions to the birds and land vertebrates of North Manitou Island; jack-pine warbler	SLBE
	Identifies species and confirms others as residents or nesters of North Manitou Island, Sleeping Bear Dunes National Lakeshore, MI. 27 additional bird and 1 additional reptile species were found on the island. The scientific and common names for each species are given.			
14	Casper, Gary; Elias, Joan	no date	no title	APIS, GRPO, INDU, ISRO, MISS, PIRO, SACN, SLBE, VOYA
	G. Casper reviewed the amphibian and reptile species lists for all nine Great Lakes Network parks. This correspondence details his notes on park status, nomenclature, and references used for the review. Actual reviews are on Excel spreadsheets.			

15	Casper, Gary S.	2002	A review of the amphibians and reptiles of the Lake Superior watershed, technical report provided to the Terrestrial Wildlife Community Committee for the Lake Superior Lakewide Management Plan	APIS
	The Lake Superior Binational Program represents a partnership of federal, state, provincian, and Tribal/First Nation governments working together with citizens to ensure protection of the Lake Superior watershed. It has completed a Lake Superior Lakewide Management Plan, which has identified a need to expand current knowledge of amphibians and reptiles in the Lake Superior Watershed (LSW). The database compiled fron institutional collections, atlassing and monitoring projects, contained 12, 166 records of for 47 species in the LSW. Record types are variable. Observations reports (N=4,769) were obtained from monitoring and atlassing projects, as well as the literature. Cataloged specimen records (N=7,322) were obtained from 26 institutions. One institution (Milwaukee Public Museum) also maintains cataloged photographs and audio tapes (N=75). Species data are discussed within this report.			
16	Cochran, Philip A.	1985	Juvenile ecology of *Necturus maculosus* (Mudpuppy); Herpetological Review	SACN
	Describes the early life cycle of this fully aquatic, and largest of the newt family. Explores habitat, food and feeding, predators, range and numbers.			
17	Coffin, Barbara, Pfannmuller,	1988	Minnesota's endangered flora and fauna	SACN
	Comprehensive reference book developed by an expert advisory committee and contributing authors. Reports on 300 species of vascular and nonvascular plants, birds, mammals, reptiles, amphibians, fish, and invertebrates. Includes overview chapters discussing each group and issues related to it, plus an account for each individual endangered, threatened or special concern species, including reasons for designation, information on habitat, distribution, range maps, and reference literature for each. Also provides description of the state's natural environment, landforms and vegetation, bibliographies and illustrations.			
18	Collins, J.T.	1991	Amphibians and reptiles in the Upper Mississippi River Valley--systematic and distributional problems; Journal of the Tennessee Academy of Sciences	MISS
	Document referenced from the Web site of the National Water Quality Assessment--Upper Mississippi Watershed. Contact the U.S. Geological Survey, Mounds View, Minnesota, for further details. Herpetological assessment of the Upper Mississippi River Valley.			
19	Cortwright, Spencer, Fielding, Eileen, Werth, Robert	1994	Aquatic amphibian occurrences in the Great Marsh of the Indiana Dunes and considerations for restoration of the natural wetland	INDU
	The report focuses on the natural history, ecology, and conservation of amphibians in the Great Marsh region of the Indiana Dunes National Lakeshore. Amphibian species composition in the Great Marsh is presented with suggestions on the restoration of the Great Marsh in light of preservation of Indiana Dunes amphibian species. Amphibian call surveys were used in conjunction with dipnet sampling to estimate species abundance. The results of the surveys are compared with historical data.			
20	DonnerWright, Deahn;	1994	No Title	SACN
	The letter contains 1993 time-search, pitfall, and turtle trapping results for Marine Ferry Landing and Dunn's Cabin at the St. Croix National Scenic River. Results of time-searches at Afton and Wild River State Parks are also reported. Turtle trapping results for an area north of Highway 70, Wild River State Park, an area south of the Osceola bridge, and the Apple River confluence are included as well. Plans for future surveys are discussed.			
21	DonnerWright, Deahn Marie	1997	Distribution and abundance of turtles along the St. Croix River, Minnesota and Wisconsin	SACN
	The distribution and population densities of turtles are reported for the St. Croix River. The turtles' corresponding habitats were also studied. Forty-eight traps were set at 12 trapping sites throughout the riverway for June of 1994 and 1995. The number of traps was increased to 84 for the months of July and August in 1994 and 1995. The age, sex, weight, and size of each turtle was determined. They were then marked and released. To characterize habitats, mean and maximum water depths, channel width, bank slope, mean stream velocity, bottom substrate, area of open sand, and number of basking locations were calculated. Tables and charts reporting the results are included.			
22	Ewert, Michael A.	1985	Second year report: assessment of the current distribution and abundance of the wood turtle (*Clemmys insculpta*) in Minnesota and along the St. Croix National Scenic Waterway in Wisconsin	SACN
	The first part of the report focuses on Minnesota for a general survey and for a feasibility survey for establishment of a wood turtle refuge. The second part discusses the survey of the St. Croix National Scenic Waterway and looks at a possible correlation of survey results and recreational development.			

23	Graetz, Jennifer L., Garrott, Robert A., Craven, Scott R.; Graetz, Jennifer L., Garrott,	1994	Grand Portage inventory; faunal surveys of agate fossil beds and Grand Portage National Monuments	GRPO
	During the fall of 1992 and the summers of 1993 and 1994, a survey of terrestrial vertebrates was conducted at Grand Portage National Monument. A wide variety of methods were utilized to determine the residency status, density and/or abundance indices, and distribution by habitat for all detected species of birds, mammals, reptiles and amphibians. Data is presented in table form and management recommendations are discussed.			
24	Grim, Leland H.	1985	Reptiles and amphibians - Voyageurs National Park	VOYA
	List of reptiles and amphibians present in Voyageurs National Park. Listed by common name and species name.			
25	Hatt, Robert Torrens	1923	The land vertebrate communities of western Leelanau County, Michigan with an annotated list of the Mammals of the County; papers of the Michigan Academy of Science, Arts and Letters	SLBE
	A list of the land vertebrates in Leelanau County, Michigan, and includes what is now Sleeping Bear Dunes National Lakeshore. There is an introduction that discusses the topography and history. There is a list of habitats: Exposed Shore, Protected Shore, Stream Conditions, Meadow, Swamp, Bog, Forest, Air, Burn and Clearing, and Artificial Conditions. These habitats are subdivided into sub-habitats. The sub-habitats are described, and the vertebrates (birds, reptiles, amphibians, and mammals) occurring in each are listed: scientific and common names, and relative abundance. There is a list of all mammals occurring in Leelanau County. There are photographs showing some of the habitats in the county.			
26	Hatt, Robert Torrens, Van Tyne, Josselyn, Stuart, Laurence C., Pope, Stuart C.,	1948	Island life: a study of land vertebrates of the islands of eastern Lake Michigan	SLBE
	Multi-year study by the Cranbrook Institute of Science to identify the land vertebrates of the islands of eastern Lake Michigan. Describes and discusses the individual character of each island, the geologic and cultural histories of the archipelago, habitat modifications, and factors of distribution. In each vertebrate class (amphibians, reptiles, birds, and mammals) the species found are listed and discussed. The scientific name and common name(s) for each species are given. The appendix lists the species found by island.			
27	Hebig, Ann	1995	Checklist of amphibians of the St Croix riverway system	SACN
	A comprehensive work, each animal is listed with common name, taxonomy and general distribution. Also provided is a source list.			
28	Henderson, Carrol	1981	Priorities for nongame conservation in Minnesota	SACN
	The symposium was held to discuss the direction of the nongame program of the Department of Natural Resources. After a keynote address, introduction, and an explanation of the program, the conference attendees divided into work groups. These work groups attended sessions covering species, habitats, and program functions. A summary of each session and of the symposium are provided. Also included is a list of participants. A new symposium is scheduled for April, 1997.			
29	Hiebert, Ronald D.	1984	Forecast of resource management issues at the Indiana Dunes National Lakeshore for the rest of the 20th Century; a scientist's perspective	INDU
	The nature and extent of resource management problems faced by the Indiana Dunes National Lakeshore are summarized. Recommendations are made for the future management of park issues, including management of the park's vegetation, wildlife, water, shorelines, visitors, information, and ecosystem fragmentation, and the effects of park operations. For each topic, a summary of the situation is provided, with recommendations for future research or management. There is a suggested chronology of research and monitoring for 1985-2000 at the end of the paper.			
30	Holmberg, Kerry L., Perry, James A., Ferrin, Randy S.,	1997	Water resources management plan for the St Croix National Scenic Riverway, Minnesota and Wisconsin: Volume II	SACN
	The report is the second volume of the Water Resources Management Plan and focuses on the presentation of data taken from various reports and studies conducted over the last ten years. Data was collected for wetland vegetation, fish, a stream survey, mussels, invertebrates, and herptofauna.			

31	Indiana Dunes National Lakeshore	1997	Draft general management plan amendment environmental assessment: East Unit: Indiana Dunes National Lakeshore	INDU
	The plan provides the philosophies and goals for managing the East Unit of Indiana Dunes National Lakeshore and serves as an environmental assessment for those goals. Alternative management plans are described in relation to natural and cultural resources and visitor use. A thorough description of the affected environment is given, and the impacts of each alternative on the lakeshore are outlined.			
32	Johnson, Wendel John	1964	Letter to William Dunmire, Chief Park Naturalist, Isle Royale National Park	ISRO
	List of 8 species of amphibians and 3 species of reptiles collected on Isle Royale National Park in 1964.			
33	Johnson, Wendel John	1965	A zoogeographical analysis of the herpetofauna in northern Michigan and adjacent Isle Royale	ISRO
	The objectives of this study were: 1) to ascertain more accurately the geographic ranges of the amphibians and reptiles inhabiting northern Michigan and 2) to examine critically animals from selected areas of Isle Royale and from the Upper and Lower Peninsulas of Michigan in an effort to establish any clinical trends that may exist. The origin of the Isle Royale herpetofauna is from Canada to the north and east. Contains an account of the species found on Isle Royale. Page 75 is a table showing a listing of the herpetofauna found on the island.			
34	Johnson, Wendel John	1963	Progress report on the herpetofauna of Isle Royale	ISRO
	Report lists the species of reptiles and amphibians collected on Isle Royale in 1963.			
35	Johnsson, Robert G., Shelton,	1960	The vertebrates of Isle Royale National Park	ISRO
	An annotated checklist with keys and descriptions of Isle Royale fishes, amphibians, reptiles, birds and mammals.			
36	Johnsson, Robert G., Shelton, Philip C., Jordan, Peter A.	1982	Wildlife of Isle Royale	ISRO
	Check lists of all vertebrate animals known on Isle Royale and their current status. Includes fishes, reptiles, amphibians, mammals and birds. This is a revision of "The Vertebrates of Isle Royale National Park," by Robert G. Johnsson and Philip C. Shelton, first published in 1960, revised by Philip C. Shelton in 1964, reprinted in 1976, and revised again in 1981 by Peter A. Jordan.			
37	Kats, Lee B., Linton, Mary C., Linton, Rebecca A.	1988	*Ambystoma maculatum* (Spotted Salamander) on N Manitou Island; Herp Review	SLBE
	A short paragraph verifying the sighting of a spotted salamander (Ambystoma maculatum) on North Manitou Island, Sleeping Bear Dunes National Lakeshore, Michigan.			
38	Krenz, James	1997	Baseline of amphibians and evaluation of catastrophic deformities on Sand Island	APIS
	This research was conducted to provide a baseline inventory of amphibians and to determine if amphibian malformations occur on Sand Island. Descriptions of important habitats, relative abundance, occurrence and distributions and documentation of any rare species was provided. One hundred one frogs and toads were captured by hand. Species captured included forty-four American toads, thirty six wood frogs, sixteen spring peepers, and five green frogs. Only one malformed specimen was found, and further examination indicated that the limb was probably lost due to a predation event.			
39	Lang, Jeffery W.	1993	Reptiles and amphibians of Minnesota [draft]	SACN
	The draft provides a one page checklist of the amphibians and reptiles in the state, along with their status and scientific name. This is followed by a map of each species giving known specimens by township or county and sighting/literature records also by township or county. A one page for each species account of the Minnesota distribution, range map in North America, preferred habitat and selected references is included.			
40	Linton, Mary C., Kats, Lee B., Scharf, William C.	1988	Update of the salamanders of the Manitou Islands; jack-pine warbler	SLBE
	A brief, but detailed description of spotted salamander (*Ambystoma maculatum*) sightings on both North and South Manitou Island, Sleeping Bear Dunes National Lakeshore. These are the first sightings on the Manitou Islands.			

41	Linton, Mary C., Kats, Lee B., Linton, Rebecca A.	no date	Update on the land vertebrates of the Manitou Islands	SLBE
	The herpetofauna of North and South Manitou Islands were surveyed during the summer of 1987. A previously unrecorded species of amphibian was found. Photographs of the species were collected and are held by the University of Kentucky Museum of Zoology. The species found are described.			
42	Linton, Mary, C., Kats, Lee, B., Linton, Rebecca, A.	1988	Update on the land vertebrates of the Manitou Islands	SLBE
	Reports a previously unrecorded amphibian species and confirms the status of amphibian and reptile species on North and South Manitou Islands, Sleeping Bear Dunes National Lakeshore. The abundance of four amphibian and one reptile species is discussed. Sampling consisted of turning over rocks, downed trees and man-made debris, and identifying the uncovered animals.			
43	Ludwig, Margaret D.	1993	Anuran (frogs/toad) survey, Apostle Islands National Lakeshore	APIS
	Frog and toad surveys were begun on the mainland unit of the Apostle Islands in 1990 and expanded to include 2 sites on Outer Island, 2 sites on Stockton Island, and 1 site on Sand Island. Data from previous surveys will be used in establishing survey dates for 1993. The first recorded observations of anurans being present on the mainland unit of the lakeshore occurred during this survey. Nine species were observed on the mainland unit: American toad, spring peeper, wood frog, green frog, eastern gray treefrog, mink frog, bullforg, chorus frog and there was one observation of a Cope's gray treefrog. Spring peepers appear to be the most abundance species observed and they were heard at all 5 sites. The eastern gray treefrog was the second most abundant and was heard at all 5 sites. The American toad and green frog were third and fourth in abundance. Spring peepers were most abundant and found at the 5 island sites. The anuran surveys conducted in the lakeshore could contribute information showing that changes in water quality and adjacent land use practices may be occurring that could have an effect on environmental quality.			
44	Mccann, Robert; Paddock, Mark W.	1975	The terrestrial vertebrates of the Pictured Rocks Region of Michigan; Natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	PIRO, SLBE
	Five trap grids were set for terrestrial vertebrates in Alger County, MI from July 1-August 8, 1973. Traps were set in a variety of habitats in the evening and retrieved the following morning. Mammals trapped and preserved were woodland jumping mouse (*Napeozapus insignis*), northern short-tail shrew (*Blarina brevicauda*), woodland deer mouse (*Peromyscus maniculatus gracilis*), meadow jumping mouse (*Zapus hudsonius*), least chipmunk (*Tamius minimus*), meadow vole (*Microtus pennsylvanicus*), northern masked shrew (*Sorex cinereus*), and boreal redback vole (*Clethrionomys gapperi*). Eastern chipmunk (*Tamius striatus*) was trapped but not preserved. Observations of various vertebrates were also made. Description of range and habitat is provided for all animals trapped as well as those whose range now includes Pictured Rocks National Lakeshore. Management recommendations are included.			
45	Mccann, Robert; Paddock, Mark W.	1975	The terrestrial vertebrates of the Sleeping Bear region of Michigan; natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	SLBE
	Lists the terrestrial vertebrates found in the Sleeping Bear Dunes area. With each species listing, there is a short paragraph summarizing where it may be found, its abundance and historical accounts of sightings. There is a list of recently extinct terrestrial vertebrates from the area and historical accounts of when the species was last seen. Methods for compiling the list consisted of live trapping in all major habitats and interviewing local residents and officials. The scientific name and common name(s) are given for each species. Offers recommendations to preserve the existing fauna of the Sleeping Bear Dunes area.			
46	Michigan DNR, Fisheries and Wildlife Division	1987	Endangered and threatened species	ISRO
	The document itemizes state listed endangered and threatened species for the state of Michigan. It includes: mollusks, insects, fishes, amphibians, reptiles, birds, mammals, and plants.			
47	Michigan Technological University, Department Of	1980	The ecosystems of Pictured Rocks National Lakeshore: their attributes and limitations for visitor use activities	PIRO
	This document reviews the findings of several studies conducted at Pictured Rocks National Lakeshore, MI concerning watersheds, surface water, geology, soils, climate, wildlife, and vegetation. Emphasis is given to plant communities and succession, including dune vegetation. Following analyses of these subjects, the suitability of these resources for human activities is addressed. Recommendations are given for appropriate placement and concentration of buildings, water use, roads, trails, electrical power lines, campgrounds, and marinas. Photographs are included. Appendices provide checklists of birds, mammals, amphibians, reptiles, and vascular plants as well as a soils map.			

48	Michigan Techonological University, Department of	no date	The ecosystems of Pictured Rocks National Lakeshore: their attributes and limitations for visitor use activities	PIRO
	A summary of the physical and biotic components of the ecosystems of Pictured Rocks is presented. The geology and geologic substrate are discussed. The soils of the region are identified and their distributions are detailed, based primarily on the 1929 Alger County soil survey. The watersheds and the streams that occupy them are identified, and the hydrology of the Lakeshore is discussed. Preliminary results of acid precipitation research on 3 of the watersheds is presented. Water quality data from a study of the water resources of the Lakeshore by Limnetics, Inc. (1970) is furnished. Taxa lists of phytoplankton and zooplankton from Lake Superior and 8 inland lakes are reproduced from data gathered by Limnetics, Inc. (1970). Climate is discussed. A review of the literature about certain mammals and their associated habitats in the Pictured Rocks area is included. The vegetation and plant successional patterns within the Lakeshore boundaries are detailed. Recommendations are given concerning the factors to be considered in choosing locations for building sites, utility systems, campgrounds, picnic areas, roads, trails, and marinas.			
49	Milwaukee Public Museum	1994	Wisconsin herpetological atlas project	SACN
	This ongoing project has hundreds of observational records and thousands of specimen listings for other museums on file for amphibian and reptile occurrences throughout the state of Wisconsin. Data are not currently computerized; however, raw listings are available from museums in the St. Croix Watershed area, such as the Carnegie Museum, Universities of Wisconsin at Stevens Point, Superior, and the Bell Museum, University of Minnesota. This is an ongoing research project designed to collect occurrence data, including the St. Croix.			
50	Minnesota County Biological Survey	1995	Inventory of biological features in Fort Snelling State Park and inventory of natural communities and rare plants in Minnehaha Regional Park	MISS
	Rare plant and natural community surveys were conducted at Fort Snelling State Park and Minnehaha Regional Park in the Mississippi National River and Recreation Area. An animal survey was also conducted at Fort Snelling State Park. Rare plants and natural communities were surveyed using releve plots to obtain quantitative information. A vegetation cover map was created. In order to survey amphibians and reptiles at Fort Snelling State Park, drift fences, turtle traps, herp searches, and call surveys were used. Bird surveys were conducted during the breeding season using point count methodologies. Small mammals were captured in drift fences with amphibians and reptiles. Ultrasonic bat detectors were used to locate foraging bats.			
51	Minnesota Department Of Natural Resources	1979	Guide to the herpetofauna of northern Minnesota - Region 2	VOYA
	Report containing lists of turtles, lizards, snakes, salamanders, toads and frogs found in Northeastern Minnesota, by county. Counties within Voyageurs National Park are included.			
52	Minnesota Department Of Natural Resources	1984	Assessment of the current distribution and abundance of the wood turtle (*Clemmys insulpta*) in Minnesota and along the St Croix National Scenic Riverway in Wisconsin	SACN
	First and second year reports detailing intensive surveys conducted for this species along the St. Croix and Namekagon Rivers. Describes sites where turtles were found, habitat considerations, preservation and management strategies, and recommendations for further study. Within the St. Croix watershed no wood turtles were found in 1984, but 10 widely scattered finds were made in 1985. The researcher concluded that large populations are not currently present along the St. Croix National Scenic Riverway. However, significant populations were found in the Cloquet and Cannon River watersheds.			
53	Minnesota Department Of Natural Resources	1990	Ongoing monitoring of endangered species in upper St Croix area of Minnesota	SACN
	Ongoing survey of endangered species, including eagles, osprey, turtles, herons and other colonial water birds.			
54	Minnesota Department Of Natural Resources; Nordquist,	1990	Faunal surveys along the St Croix River in Chisago and Washington Counties, Minnesota	SACN
	As part of a state-wide effort to identify rare natural communities and their component species, the Minnesota County Biological Survey has inventoried two counties adjacent to the St. Croix River. Surveys conducted in Chisago County, 1990 and Washington County, 1988, documented the occurrence of six bird and eight herptile species listed by the state as threatened or of special concern status. Selected habitats adjacent to the St. Croix River were censused for characteristic avian, mammalian and herptilian assemblages.			
55	Minnesota Department Of Natural Resources	1991	Study of blandings, painted and snapping turtle populations around wetlands in Isanti County, Minnesota	SACN
	Study of three turtle species around wetlands with various degrees of land-use development. Includes evaluation of impacts of development on age and sex structures of turtle populations, and impacts of draw-down and reflooding of wetland areas for game management on turtle populations.			

56	Minnesota-Wisconsin Boundary Area Commission	1994	Lower St. Croix National Scenic Riverway river stewardship guide: for landowners, local government officials and others	SACN
	The report contains a description of the natural and political boundaries of the St. Croix River, a guide for citizen involvement, land use regulations, and future river scenarios. Also included are a guide for the creation of local government ordinances, a directory of useful contacts, and operational charts. The historic and current natural resource conditions are described. Many of the pages contain lists of animal and plant species that occur within the St. Croix River watershed.			
57	Necker, Walter L.	1939	Terrestrial vertebrates of the Indiana Dunes; terrestrial vertebrates of the Indiana Dunes	INDU
	This brief article lists the amphibians, reptiles, and mammals collected or observed in the area of the Indiana Dunes National			
58	Oldfield, Barney, Moriarty, John J.	1994	Amphibians and reptiles native to Minnesota	MISS, SACN, VOYA
	Book describes the history of herpetology in Minnesota, describes habitats, and provides detailed information on identification of individual species and areas of possible occurrence. Data that was collected over the years at Voyageurs National Park (pre and post establishment) is included throughout though not necessarily indicated specifically.			
59	Palmer, Joe	1988	The reptiles and amphibians of Voyageurs National Park	VOYA
	Analysis of the herpetofauna of Voyageurs National Park was performed by trapping reptiles and amphibians in pitfall traps and collecting with a dip net. Reptiles and amphibians were also collected when they were caught in trap nets and the seines used in ichthyological research. The herpetological collection of the James Ford Bell Museum of Natural History and various literature were consulted to determine what other species of reptiles and amphibians might exist in the park. In all, 7 species of amphibians and 3 species of reptiles were found in the park and an additional 10 species of amphibians and 3 species of reptiles were identified that may exist in the park.			
60	Peloquin, Robert L., Whitman, Richard L., Werth, Robert J.	1990	Ecology of Miller Woods	INDU
	An inventory of the natural resources of Miller Woods was conducted to assist the Indiana Dunes National Lakeshore in protecting the resources and informing the public about the area's diversity. A means of assessing the impact of visitation on the resources was established. This report summarizes the qualitative and quantitative data and articulates management concerns regarding four major types of natural resources occurring at Miller Woods: aquatic and terrestrial vascular plants; aquatic and terrestrial invertebrates; fishes, amphibians, birds and mammals; and geological features and erosional potential. Statistical analysis of ecological data, as well as collected material and photographic slides, are used to document species, natural habitats and special features of the area. Data tables, location maps and statistical analysis are included for each chapter.			
61	Pictured Rocks National	no date	Collection of slide transparencies	PIRO
	The collection of slide transparencies at Pictured Rocks National Lakeshore, MI is comprised of approximately 4,186 different slides about natural resource subjects. They illustrate geologic features, soils, erosion, aquatic habitats, woody plants, herbaceous plants, non-flowering plants, birds, mammals, reptiles, amphibians, fish, insects, other invertebrates, and research and monitoring programs.			
62	Pictured Rocks National Lakeshore	1979	Section on description of the environment; Resources management plan	PIRO
	The physical and biological aspects of the environment of Pictured Rocks National Lakeshore, MI are addressed in this portion of the Resource Management Plan for the Lakeshore. Descriptions of the climate (temperature, precipitation, evaporation), geology (bedrock, glacial, and post-glacial features), soils, vegetation, and animal life each compose a chapter. Maps of soils, general land use, and sand movement on the Grand Sable Dunes are provided. Included are checklists of mammals, amphibians, reptiles, birds, and plants.			
63	Premo, Dean B., Davis, Jeff	1990	A survey of the herpetofauna along the proposed Beaver Rim Road in the Pictured Rocks National Lakeshore	PIRO
	A survey of the reptiles and amphibians of the central and eastern portions of Pictured Rocks National Lakeshore, MI was conducted to provide information concerning the effect that the proposed Beaver Basin Rim Road would have on their populations. The study area was divided into 6 zones. Eight habitats were identified: northern hardwoods, mixed deciduous/coniferous, mixed coniferous, white cedar/tag alder, sphagnum bog, lakes and ponds, stream, and coniferous plains. Sampling of snakes, frogs, toads, newts, salamanders, and turtles was conducted during daytime and nighttime hours from April through August (192 hrs over 24 days). The reptiles and amphibians were collected by hand, dip net, baited minnow traps, and modified fyke nets (turtle traps). Vocalizations of frogs and toads were also used to identify and count those species. Sampling time was not equal among the zones. Abundance of each species is given for each zone, each habitat type, and in total. Nineteen of the 26 species of reptiles and amphibians known from the Upper Peninsula were collected. This included 4 salamanders, 1 newt, 4 snakes, 3 turtles, 6 frogs, and 1 toad.			

64	Resetar, Alan	no date	The amphibians and reptiles of Indiana Dunes	INDU
	no abstract available			
65	Resetar, Alan	1994	Amphibians and reptiles in the most recent land additions of the Indiana Dunes National Lakeshore	INDU
	Drift fences, funnels, and opportunistic searches were used to collect amphibian and reptile species at additions to Indiana Dunes National Lakeshore. Rare and state-listed species were especially targeted. Management concerns were noted throughout the survey and are discussed in the report.			
66	Resetar, Alan	1994	The amphibians and reptiles of the Indiana Dunes National Lakeshore	INDU
	The report is the culmination of field work in the Indiana Dunes National Lakeshore and vicinity from 1974 to 1994. Over 2,000 amphibians and reptiles were collected, and several more species were discovered through literature searches, field notes, and museum records. The report is divided into sections covering the history of herpetology in the Indiana Dunes and species accounts. Each species account includes sections on Indiana status, historical and recent locality records for areas adjacent to or within the boundaries of the park, historical and current distribution in the park, habitat preferences, threats and natural history. Distribution maps are also included with each account. The species accounts are also divided into sections by family, including Anura, Caudata, Lacertilia, Testudines, and Serpentes.			
67	Resetar, Alan	1988	Distribution and ecology of amphibians and reptiles in selected areas of Lake, Porter, LaPorte and Newton Counties, Indiana with special emphasis on state-listed species	INDU
	Drift fences, screen funnel traps, and plastic buckets were used to collect amphibian and reptile species throughout northwestern Indiana, including at Indiana Dunes National Lakeshore. Historic and current location data are given for each species. Descriptions of the habitats in which each species was found and possible threats the species may encounter are also included. Drift fence array trapping methods were also used in six habitat types to determine the habitat preferences of each species found. Maps containing the locations at which species were trapped are also included.			
68	Resetar, Alan	1985	The status of state listed herpetofauna within the Indiana Dunes National Lakeshore: draft of final report	INDU
	Drift fences were placed at nineteen sites at Indiana Dunes National Lakeshore to collect Indiana state-listed reptile and amphibian species. The data collected was used to describe historic, current, and potential distributions of each species. Habitat preferences and potential threats to each species are also discussed. Maps containing the locations at which each species was caught are also included.			
69	Rogers, Elizabeth I., Premo, Dean B., Tiller, David	1995	A baseline inventory of amphibians, reptiles, mammals, and owls on Long Island	APIS
	A baseline inventory of amphibians, reptiles, mammals and owls was conducted on Long Island during July of 1995 to provide a preliminary faunal inventory of the island. Six species of amphibians, 4 species of reptiles, 14 mammal species, one bat species, and one species of owl were identified during the survey.			
70	Rosenfield, Robert N., Morasky, Christopher M., Bielefeldt, John	1991	The potential effects of habitat fragmentation by the Beaver Basin Rim Road in the Pictured Rocks National Lakeshore: a literature review	PIRO
	The report contains an extensive bibliography of documents pertaining to habitat fragmentation, with emphasis on its effects on vertebrate species, and includes copies of 14 publications whose themes pertain to the proposed Beaver Basin Rim Road corridor at Pictured Rocks National Lakeshore, MI. Mammals, birds, fish, reptiles and amphibians are discussed in relation to edge habitat, nesting, and dispersal.			
71	Ruthven, Alexander G.	1912	The reptiles of Michigan	ISRO
	A report on the reptiles of Michigan with an annotated bibliography. Includes species collected, reported or observed from Isle Royale.			
72	Ruthven, Alexander G., Thompson, Crystal, Thompson, Crystal	1912	The herpetology of Michigan; Michigan Geological and Biological Survey Publication 10, Biological Series 3 Published as part of the Annual Report of the Board of Geological Survey for 1911	ISRO
	This volume contains three papers: (1) "The Amphibians of Michigan" by Crystal Thompson and Helen Thompson, pages 13-62; (2) "The Reptiles of Michigan" by Alexander Ruthven, pages 63-165; and (3) "Memoranda Towards a Bibliography of Archaeology of Michigan" by Harlan I. Smith, Pages 167-180.			

73	Ruthven, Alexander Grant	1909	The cold-blooded vertebrates of Isle Royale	ISRO
	Describes 17 fish species, 6 amphibian species, and one snake collected on Isle Royale.			
74	Sadinski, Walt, Roth, Mark, Monson, Leah, Fanta, Tyler, Bourassa, Sam; National Park Service	2003	Inventories of amphibians and turtles in the upper midwest via USGS's amphibian research and monitoring initiative and NPS's inventory and monitoring program; Western Great Lakes research conference and Chequamegon Bay area natural resource conference	SACN
	The U.S. Geological Survey staff at the Upper Midwest Environmental Sciences Center in La Crosse, WI conducted amphibian and turtle inventories at the Upper Mississippi National Wildlife and Fish Refuge Complex, St. Croix National Scenic River, and Voyageurs National Park. Inventories conducted on Park Service lands were done as part of an agreement with the National Park Service's Inventory and Monitoring Program. Amphibians were surveyed in random 25-ha blocks using visual and call surveys. Individuals were screened for diseases and deformities.			
75	Scharf, William C.	1973	Birds and land vertebrates of South Manitou Island; jack-pine warbler	SLBE
	The geographical location and geological features of South Manitou Island, Sleeping Bear Dunes National Lakeshore gives the island an interesting collection of fauna. There are many common mainland animals absent from the island. The origin of the South Manitou Island Fauna and the ecological effects of each land vertebrate class are discussed. A checklist of amphibians (5 species present), reptiles (5 species), birds (179 species) and mammals (10 species) found on the island is presented. The common name(s) and scientific names of the species are given.			
76	Scharf, William C.	1973	Sleeping Bear Dunes: Manitou Island animal life: birds and land vertebrates of South Manitou Island; the jack-pine warbler	SLBE
	A checklist of the birds and land vertebrates of South Manitou Island was created through a variety of survey methods. Birds were captured and banded with mist nets and by visiting nests. Small mammals were surveyed using snap and live traps. Reptiles and amphibians were also surveyed. Specimens were collected and entered into the teaching collections at Northwestern Michigan College.			
77	Scharf, William C., Jorae, Michael, L.	1980	Birds and land vertebrates of North Manitou Island; jack-pine warbler	SLBE
	The geographic location, glacial history, and habitats in relation to the fauna of North Manitou Island, Sleeping Bear Dunes National Lakeshore are discussed. A checklist of the amphibians (6 species present), reptiles (5 species), birds (164 species) and mammals (16 species) found on the island is presented. The scientific name and common name(s) are given for each species.			
78	Schulz, Robert A.	1976	Animal ecology of Bear Island, Wisconsin, Apostle Islands National Lakeshore	APIS
	A survey of the existing fauna of Bear Island, Wisconsin, Apostle Islands National Lakeshore was conducted in the summer of 1974. The island's fauna was found to consist of four species of amphibians, one species of reptiles, eighty-seven species of birds, and six species of mammals. Annotated species lists, distributions, relative abundances, home ranges, and habitat utilization were developed for the existing fauna. Theories pertaining to the dispersal of the land vertebrates are also discussed.			
79	St. Croix National Scenic Riverway	1990	Blanding's turtle species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1990. The Blanding's turtle (*Emydoidea blandingi*) is a threatened species in both Wisconsin and Minnesota, and a federal watch (C2) species. Information provided includes the date, state, county, location, observer, and notes. Also included is a field report section (Ewert) relating to this animal (biology, ecology, etc.), staff findings with site specific descriptions, and information from Cook, Vogt and Coffin.			
80	St. Croix National Scenic Riverway	1988	Bull snake or gopher snake species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1988. The bull snake (*Pituophis melanoleucus*) is a special concern species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections (Vogt, Coffin and Phanmuller, Cook) relating to this animal (biology, ecology, etc.), some distribution maps are furnished.			

81	St. Croix National Scenic	1989	Bullfrog species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1976 to 1989. Bullfrogs (*Rana catesbeiana*) are a Minnesota special concern, species. Information provided includes the date, state, county, location, observer, and notes. Also included is report section relating to this frog (biology, ecology, etc.). From the Milwaukee Public Museum, site specific descriptions are also furnished.			
82	St. Croix National Scenic Riverway	1989	Eastern milk snake species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. The eastern milk snake (*Lampropeltis triangulum*) is a special concern species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections (Vogt, and Cook) relating to this animal (biology, ecology, etc.).			
83	St. Croix National Scenic	1989	Fox snake species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1982 to 1989. The Fox snake (*Elaphe vulpina*) is a special concern species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included is a report from the Coffin and Phannmuller relating to this animal (biology, ecology, etc.), location data from the Milwaukee Public Museum, and general species information from Cook.			
84	St. Croix National Scenic	1990	Five-lined skink species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1990. The five-lined skink (*Eumeces fasciatus*) is an endangered species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included is a section (Vogt) relating to this animal (biology, ecology, etc.).			
85	St. Croix National Scenic	1996	Wood turtle species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1985 to 1996. The Wood Turtle (*Clemmys insculpta*) is a threatened species in both Wisconsin and Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included is a field report section (Ewert) relating to this animal (biology, ecology, etc.), with site specific descriptions and maps of finds.			
86	St. Croix National Scenic	1996	Species list: by district	SACN
	This document is a series of checklists, done for each of the three districts, for most major groups of flora and fauna. There is a list for vascular plants/trees, birds, fish, dragonflies, reptiles and amphibians, mammals, and mussels. Some information contains site locations.			
87	St. Croix National Scenic	1996	Species list: amphibians/reptiles	SACN
	Several checklists make up this file on amphibians and reptiles along the Riverway. Lists are broken into animal type, district location, and source author. Also included is site and species information from a survey study done on the Riverway in 1994 and 1995. Presented with this data are location maps.			
88	St. Croix National Scenic	1989	Snapping turtle species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1975 to 1989. The Snapping turtle (*Chelydra serpentina*) is a special concern species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included is a report from the National Biological Survey relating to this animal (biology, ecology, etc.), location data from the Milwaukee Public Museum, and species information in Wisconsin from Vogt.			
89	St. Croix National Scenic	1997	Riverway slide collection	SACN
	This collection contains slide photographs of all aspects of the Riverway. A limited number of photographic prints (primarily landscapes) are also included with the collection. Slide topics include plants, arthropods, fish, amphibians, reptiles, birds, mammals, geology, history, scenic, trails, recreation, park personnel and structures, park threats, energy, and miscellaneous related topics.			
90	St. Croix National Scenic	1989	Pickerel frog species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1909 to 1989. Pickerel frogs (*Rana palustris*) are a Minnesota special concern species. Information provided includes the date, state, county, location, observer, and notes. Also included is report section relating to this frog (biology, ecology, etc.). From the Milwaukee Public Museum, site specific descriptions are also furnished.			

91	St. Croix National Scenic	1989	Eastern hognose species location summary for the St Croix River	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1981 to 1989. The eastern hognose snake (*Heterodon platyrhinos*) is a special concern species in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections (Vogt, Coffin and Phanmuller, Cook,) relating to this animal (biology, ecology, etc.).			
92	Thompson, Crystal, Thompson, Helen; Ruthven, Alexander G., Thompson,	1912	The amphibians of Michigan; The herpetology of Michigan	ISRO
	A report on the amphibians of Michigan with an annotated bibliography. Includes species collected, reported or observed from Isle Royale.			
93	U.S. Army Corps Of Engineers	1997	An evaluation of the Upper Mississippi River System environmental management program: appendix A - long term resource monitoring program	MISS
	This report to Congress is designed to enlist support for funding authorization. This program is a wide reaching attempt to inventory and monitor the environmental resources of the upper Mississippi River. The report details the ecological state of the river system, outlines the long term monitoring program, provides a look at the habitat rehabilitation and enhancement projects, and gives abstracts of current research. Selected topics include invertebrates, freshwater mussels, plants, forests, fish, reptiles and amphibians, birds, water quality, hydrology, sediment, and geology.			
94	Van Buskirk, Josh, Smith,	1993	Between the devil and the deep blue Lake; Natural History	ISRO
	Chorus frogs at Isle Royale face an especially difficult challenge. Recurrent northeastern storms pound the small islands and peninsulas with waves and ice, washing the bedrock free of soil and young trees. Hundreds of washtub-size pools speckle the rocky shorelines, and these become the breeding pools for chorus frogs. Not all the rock pools are suitable nurseries because those too close to the lake will be scoured out by storm waves before the tadpoles have had sufficient time to mature. Found that roughly 15% of all tadpoles are carried into the lake by waves before where they soon perish. 10% of tadpole populations die each year in small pools that are shallow enough to dry out. Frogs do lay most of their eggs in the middle zone - just below where predatory dragon fly larvae live and just above the region washed by summer storm waves. Egg laying frogs avoid pools where dragonflies are present. Because female frogs are forces to choose among relatively few pools, crowding and food competition become the predominant features of tadpole life and regulate population size.			
95	Van Buskirk, Josh, Smith,	1991	Density-dependent population regulation in a salamander; Ecology	ISRO
	The authors studied population responses to variation in larval density in a salamander that breeds in splash pools on exposed rocky shorelines at ISRO. Population densities and size distributions were sampled in the field with little error due to clear water and pools free of sediment and vegetation. The authors manipulated salamander densities in 12 natural pools and simultaneously monitored salamander populations in 27 control pools on two islands. The experiment demonstrated that increasing density significantly reduced survival and growth, and increased the skew in the size distributions of individuals. Each of these responses was also observed in natural populations. Density effects were probably due to interference because (1) natural variation in the densities of prey taxa did not influence salamander performance in the experiment, (2) salamander density had no effect on prey availability, and (3) tail damage from attacks by conspecifics was widespread and positively correlated with density. Density dependence is commonplace in salamander larvae, and probably makes an important contribution to regulating the population size of *Abystoma laterale* at ISRO.			
96	Van Buskirk, Josh, Smith, David C.	1993	Phenotype, plasticity, and performance in tadpoles; Bulletin of the Ecological Society of America	ISRO
	no abstract available			
97	various compilers	1997	Marsh monitoring project	INDU
	This folder contains data sheets pertinent to the marsh monitoring project at the Indiana Dunes National Lakeshore. Various amphibian and bird survey routes are described in text and with maps. Data sheets for call surveys provide data on species, location, and abundance of animals surveyed along those routes. Digital photographs of specific survey stops along the routes are also provided. The general nationwide survey protocols and background information are also included.			
98	various compilers	1997	Untitled: amphibian survey data	INDU
	This document consists of a compilation of amphibian survey data sheets from various survey locations throughout the Indiana Dunes National Lakeshore. Data sheets indicate the species and location of frogs and toads encountered along specific survey routes.			

99	Vogt, Richard Carl	1981	Natural history of amphibians and reptiles of Wisconsin	MISS, SACN
	A comprehensive study of the reptiles and amphibians in Wisconsin and the upper Midwest. The book provides historical background on the state's herpetology, physiography and vegetation. There is a definition of ecotypes (including photographs of each), the role herps play in the food chain, and to the economy. There is a key to each species, followed by a natural history, which includes a description, range, habitat and habits. Photographs of each species, including, in many cases, eggs and larva are provided. There is a glossary, index and an extensive bibliography.			
100	Walker, C. F.	no date	Isle Royale Records: amphibians and reptiles from Isle Royale in the University of Michigan Museum of Zoology	ISRO
	A list of amphibian and reptile specimens kept in the University of Michigan Museum of Zoology.			
101	Warren, Steve, Crow, Thomas R., Probst, John R.	1993	Minnesota-Wisconsin Boundary Area Commission/University of Minnesota LCMR project: terrestrial habitat analysis (Deliverable B.7)	SACN
	The report describes an analysis of habitats in the lower St. Croix Riverway that was designed to understand, interpret, and predict population trends of terrestrial species. Lists of species impacted by change and species preferred habitats, forest maps, and graphs depicting changes in habitat are included.			
102	Watermolen, Dreux J.	1995	Key to the eggs of Wisconsin's amphibians, a research report	SACN
	The characteristics of amphibian eggs are discussed and a key to the eggs of Wisconsin's 19 amphibians is presented. Specimen photographs for seven species are also included.			
103	Willson, Gary D.	1990	Endangered species survey covers Midwest Region Parks; Park science: A resource management bulletin	ISRO, PIRO, SLBE
	A survey of state and federal listed species was conducted at the Midwest Region National Parks. Literature was consulted and field surveys were conducted to location rare species in the National Parks and to determine management and research requirements for each species.			
104	Wisconsin Department Of Natural Resources	1981	Leopard frog populations and mortality in Wisconsin, 1974-76	SACN
	Describes leopard frog populations statewide, including St. Croix watershed. Describes population dynamics and mortality survey.			
105	Yarrow, H. C.	1883	Check list of North American reptilia and batrachia; Bulletin No 24, U S Nat Mus	ISRO
	no abstract available			

INSECTS and SPIDERS

1	Adams, Charles C.	1909	Annotations on certain Isle Royale invertebrates; an ecological investigation of Isle Royale, Lake Superior	ISRO
	An annotated list of invertebrate species collected on Isle Royale.			
2	Adams, C.C., Ruthven, A.G.	1906	Spiders and insects from the Porcupine Mountains and Isle Royale, Michigan; an ecological survey in northern Michigan	ISRO
	no abstract available			
3	Adams, C.C., Wheeler, W.M.	1909	The ants of Isle Royale, Michigan; an ecological survey of Isle Royale, Lake Superior	ISRO
	no abstract available			
4	author unknown	no date	Insect collection	INDU
	A small collection of insects gathered at the Indiana Dunes National Lakeshore is located in the park's herbarium. Specimens are dry-mounted, and labeled with specific scientific and common names.			
5	author unknown	1994	Karner blue butterfly habitat restoration and corridor establishment at Indiana Dunes National Lakeshore	INDU
	This proposal gives a brief life history of the Karner blue butterfly (*Lycaeides melissa samuelis*), and a history of its populations at the Indiana Dunes National Lakeshore. The goal of the Karner habitat restoration project at the park is outlined, along with how it is to be implemented, benefits of the restoration project to resources, what will be done, who will do it, how the results will be evaluated, and what the budget for the 1995 activities would be.			
6	Ballard, Jr., Harvey E.	1993	Survey for federal and state listed plants and insects along the proposed access road alignment at Voyageurs National Park	VOYA
	The National Park Service has proposed to reconstruct the access road leading to the Ash River Developed Area in Voyageurs National Park. An assessment of potential environmental impacts is being made with particular concern over the potential of several rare plant or insect population occurrences along the project corridor. A survey was conducted along approximately 3 1/2 miles of the proposed access road alignment for federally listed, federal candidate, and state listed vascular plant and insect species in August of 1993. This report discusses the methods used, the survey results and a proposal of relocation of a federal candidate species of violet found within the project areas. Actual survey forms are included with this report along with a previous report on the distribution and status of the concerned violet species by the same author.			
7	Bowden, Richard Drew	1981	Benthic macroinvertebrates and chemistry of three streams on Isle Royale National Park, Michigan	ISRO
	The benthic macroinvertebrate community and chemistry of three low order streams on Isle Royale were examined in 1979. pH and alkalinity showed inverse relationships with discharge. Both pH and alkalinity were distinctly lower at the headwater areas than at downstream sites. Cation analysis revealed inverse relationships with discharge for calcium, magnesium and potassium. Sodium showed little relationship to discharge. All cations except potassium showed high streamwater concentrations. Concentrations were higher at down-stream sites than upstream sites. Diverse compositions of macroinvertebrate fauna were found in all streams with taxa generally comparable to similar Lake Superior basin streams. The majority of the invertebrates collected were in the class Insecta. Diptera was the dominant order at upstream sites, whereas Ephemeroptera, Coleoptera, Plecoptera, and Tricoptera were more prominent downstream.			
8	Bowman, Jerry	1974	Some observations and ecological considerations concerning the tiger beetles of South Manitou Island	SLBE
	Determined the number of tiger beetle species (*Cicindela* sp.) present on South Manitou Island, Sleeping Bear Dunes National Lakeshore, MI. Eight species of tiger beetles were found on the island. The field methods for collecting the specimens involved using a sweep net and killing jar. The specific habitat, associated plant types, topography, and geographic location of each collection was recorded. There are maps showing the distribution of tiger beetles in relation to soils and to physical features.			

9	Chynoweth, J.J.	1987	Supplement to the 1983 preliminary checklist of the butterflies, and skippers, of Isle Royale National Park	ISRO
	This report is to update the checklist of the Lepidoptera of Isle Royale as drafted by M. C. Nielson, et al. This list updates the genus or species name.			
10	Cockrell, B.J., Brower, L.P.	1987	Monarch butterfly voltinism: effects of temperature constraints at different latitudes; Oikos	SACN
	Tests the hypothesis that upper and lower temperature constraints may be the major factors determining the timing and number of monarch generations at differing latitudes. This is accomplished by comparing observations in Florida and Wisconsin of breeding monarchs to predictions of expected numbers of generations based on temperature data.			
11	Craig, George B.	1980	1979 investigators annual report - collection of Aedes mosquitoes for subsequent genetic research	ISRO
	The author and his students collected the rockhole mosquito, *Aedes atropalpus* , from near Rock Harbor. The group hoped, but failed, to collect *Aedes triseriatus* , the treehole mosquito.			
12	Craig, George B.	1988	1988 Investigators annual report - collection of living larvae of *Aedes atropalpus* , the Rockpool mosquito, for laboratory collection	ISRO
	Refers to the collection of mosquito larvae from Isle Royale: *Culex restuans* and *Aedes atropalpus* .			
13	Craig, George B.	1988	Letter to Robert J Krumenaker, Isle Royale National Park	ISRO
	Refers to the collection of mosquito larvae from Isle Royale: *Aedes canadensis* and *Aedes atropalpus* .			
14	Felsk, Joshua	1996	1996 investigators annual report: documentation of insect fauna found on moose carcasses in the Rock Harbor area	ISRO
	Presents a list of insects found utilizing moose carcasses on Isle Royale.			
15	Ferge, Leslie A.	1996	Baseline inventory of Lepidoptera on Long Island, Apostle Islands National Lakeshore, Ashland County, Wisconsin	APIS
	The purpose of this study was to document the *Lepidoptera* (butterfly and moth) fauna associated with the dominant plant community types on Long Island, and to determine whether any endangered, threatened or rare species occur there. The Lepidoptera are increasingly being recognized as sensitive indicators of the integrity and continuity of native ecosystems, and can provide a measure of successful habitat management and restoration. In total, 277 macrolepidoptera (16 butterfly and 261 moth species) were recorded on Long Island. Due to cold weather conditions inhibiting early and late season moth activity, it is likely that some occurring in late May-early June and September were not documented. No Federally-listed or State-listed endangered or threatened species were found on Long Island.			
16	Ferge, Leslie A.	2001	Lepidoptera of Apostle Island Sandscapes, AINL, Ashland & Bayfield Counties, WI	APIS
	The purpose of this study is to compile a baseline inventory of the *Lepidoptera* (butterfly & moth) fauna associated with sandscape communities on the Islands. Outer Island Sandspit had 108 species recorded: Stockton Island Tombolo, 105 species; Raspberry Island Cuspate Foreland, 94 species; and Rocky Island Cuspate Foreland, 85 species. No Federally-listed or State-listed endangered or threatened species were found, however, one species classified as Special Concern by the Wisconsin DNR was documented.			
17	Grim, Leland H.	1995	Lepidoptera biodiversity questionnaire	VOYA
	Memorandum and attached completed questionnaire concerning the lepidoptera species (butterflies and moths) in Voyageurs National Park, and what information is available on them.			
18	Grundel, Ralph	1996	Arthropod indicators of oak savanna status [proposal]	INDU
	This document describes a proposal to study oak habitat structure and fire history in relation to resident biological diversity. An inventory of the insects of oak habitat sites was initiated for the study at the Indiana Dunes National Lakeshore. Further analysis is proposed, including sampling of arthropods in areas of historically different fire regimes. It is also proposed to study small, isolated oak savanna fragments to determine how insects with limited versus good dispersal abilities are affected by size and isolation of oak habitats. An overview of the project to date is included, with logistical summaries of products, personnel, and costs involved. Qualifications of project personnel are also included.			

19	Grundel, Ralph, Pavlovic, Noel B., Sulzman, Christina L.	1996	The effect of canopy cover and seasonal change on host plant quality for the endangered Karner blue butterfly (*Lycaeides melissa samuelis*)	INDU
	In this paper, the possible correlation between oviposition site selection and larval growth for the Karner blue butterfly (*Lycaeides melissa samuelis*) is examined. Lupines (*Lupinus perennis*) of different phenological age, and lupines growing under different shading and soil conditions were examined for how well they supported Karner blue butterfly larval growth in the laboratory. Habitat factors that affect larval growth are identified, and suggestions for future studies of factors affecting oviposition site selection are provided.			
20	Hine, James S.	1909	Diptera of the 1905 University museum expedition to Isle Royale	ISRO
	Describes the species of Diptera (flies) collected on Isle Royale in 1905.			
21	Hodges, R.W.	1957	A qualitative insect survey of Keweenaw County, Michigan with emphasis on the biting flies	ISRO
	Lists species of biting flies collected on Isle Royale in 1957.			
22	Huang, Paul C., Arzarian, Ken	no date	Insect collections	INDU
	These extensive insect collections were donated to the Indiana Dunes National Lakeshore, and are preserved in the park's museum. Each specimen is dry-mounted, and labeled with its scientific and common name, collection location, and other pertinent information. Many specimens are not from Indiana.			
23	Hubbard, H.G., Schwarz, E.A.	1878	List of Coleoptera found in the Lake Superior Region; Proc Amer Phil Soc	ISRO
	no abstract available			
24	Isle Royale National Park	no date	Entomology collection	ISRO
	Cabinet with 200 specimens organized by family into 12 drawers. All specimens are mounted and labeled with common and scientific names. The name of the collector and/or organizer is unknown. This collection includes butterflies, moths, flies, bees, dragonflies, and beetles.			
25	Isle Royale National Park	no date	Butterfly biodiversity; Isle Royale-naturalist activities	ISRO
	The document includes a brief description of butterflies and their role as ecological indicators. I also contains a checklist showing the diverse kinds of behaviors butterflies exhibit and a list of those common to ISRO.			
26	Jennings, Sue	1994	Karner blue butterfly	SACN
	This notebook contains park related information on the endangered Karner Blue Butterfly (*Lycaeides melissa samuelis*). Provided is background information on status, distribution, biology, and identification (including photographs of male, female, underwing, and habitat). Park survey data, monitoring protocols, and habitat evaluation forms are included. Habitat maps are provided.			
27	Klubertanz, Thomas H.	1993	1993 investigators annual report	ISRO
	Two mayfly specimens were collected at Davidson Island and Wood Lake on Isle Royale. They were identified as two adult*Stenonema femoratum* (Say) (Ephemeroptera: Heptageniidae). Collected specimens were deposited in the author's research collection.			
28	Kraft, Kenneth J.	1993	1993 investigators annual report	ISRO
	Lists progress to date in monitoring thimbleberry (*Rubus parviflorus*) gall insects (*Diastrophus kincaidii*) on Isle Royale. This report says that the galls collected are discarded and the reared insects are retained at Michigan Technological University.			
29	Kraft, Kenneth J., Erbisch, Frederic H.	1990	Spring 1990 Thimbleberry report	ISRO
	Presents information the stem galls caused by the cynipid wasp, *Diastrophus kincaidii Gillette* , on thimbleberry (*Rubus parviflorus Nuttall*), the only host of this gallmaker. This insect may have arrived on the Keweenaw Peninsula of Upper Michigan within the past ten years.			

30	Kraft, Kenneth J., Erbisch, Frederic H.	1990	The thimbleberry gallmaker, *diastrophus kincaidii* (Hymenoptera: Cynipidae) in the Great Lakes region; The Great Lakes Entomologist	ISRO
	Diastrophus kincaidii , a gall wasp previously known only from California and the Pacific Northwest, is reported from the Great Lakes Region, including Isle Royale National Park. It is present on thimbleberry, *Rubus parviflorus* , in three counties in the Upper Peninsula of Michigan and in Duluth, Minnesota. It may have arrived on the Keweenaw Peninsula of Upper Michigan within the past ten years. Information about its biology, distribution and abundance is presented.			
31	Leconte, J.L.	1878	The Coleoptera of the Alpine regions of the Rocky Mountains; Bull U S Geol and Geogr Surv Terr	ISRO
	Page 463 describes *Magdalis alutacea* (armicollis Say) from Colorado and Isle Royale specimens.			
32	Leconte, J.L.	1850	General remarks upon the Coleoptera of Lake Superior	ISRO
	Describes beetle species found on Isle Royale			
33	Malcolm, S.B.	no date	Monarch butterfly voltinism: effects of temperature constraints at different latitudes; Oikos	SACN
	Reports on field observations of monarch butterfly reproductive behavior in Florida and Wisconsin as it relates to temperature constraints. Includes site observations at St. Croix Falls, Wisconsin.			
34	Maskey, Amy E.	2003	Alger County, Michigan, Lepidoptera survey - taxa list by family/subfamily	PIRO
	Butterflies and moths (Insecta: Lepidoptera) collected from 2000 through 2003 in Alger County, Michigan, are listed phylogenetically by family, subfamily, and species. General methods are reviewed. For each specimen date of collection, name of collector, location and habitat of collection site, sex of specimen, and pertinent notes are provided. Specimens collected in Pictured Rocks National Lakeshore are identified as such.			
35	Michigan Natural Features Inventory	1990	Lake Huron locust, *Trimerotropis huroniana* Walker, C2 candidate, state threatened [DRAFT]	PIRO
	The State of Michigan lists the Lake Huron locust, *Trimerotropis huroniana* Walker, as threatened. It is known from coastal sand dunes around the Great Lakes including the Lake Superior shoreline from Schoolcraft to Alger Counties. This includes the Grand Sable Dunes of Pictured Rocks National Lakeshore, MI. A description of the grasshopper-like insect, its life history, distribution, and habitat are reviewed. Current conservation and management efforts are discussed.			
36	Moore, S.	1960	A revised annotated list of the butterflies of Michigan	ISRO
	This list indicates which species were found on Isle Royale in surveys completed through 1956.			
37	Mueller, Stephen	1987	Biogeographical survey of *Lycaeides idas nobokovi* (Lepidoptera, Lycaenidae) in Michigan	ISRO
	Lycaeides idas nobokovi , the northern blue butterfly, is possibly Michigan's rarest and most restricted butterfly species with only one known breeding colony. It is listed as threatened in Michigan. It's larval host, dwarf bilberry (*Vaccinium cespitosum*), is also threatened in Michigan. Study sites are located in Michigan's Upper Peninsula and include Isle Royale National Park. Isolated northern blue butterfly individuals were found on two areas of Isle Royale previously but none were found during this study. This report includes a list of butterfly species observed at Isle Royale during the study period, including a new record, *Cercyonis pegala nephele* or the Common Wood Nymph.			
38	Mueller, Stephen	1987	Investigator's annual report - 1987	ISRO
	Author found a new butterfly species to add to the Isle Royale fauna named *Cercyonis pegala nephele* , common wood nymph.			
39	Mueller, Stephen J.	1987	Letter to Mr. Robert Krumenaker, resource management specialist, Isle Royale National Park	ISRO
	Describes status of a research project of the Northern Blue Butterfly (*Lycaeides idas nobokovi*), listed as threatened by the Michigan Department of Natural Resources. This butterfly's larval host, Dwarf Bilberry (*Vaccinium cespitosum*) is also threatened in Michigan. A significant and unrelated discovery during the 1987 research added a new butterfly species to the Isle Royale fauna, Common Wood Nymph (*Cercyonis pegala nephele*).			

40	Mueller, Steven	1987	Biogeographical survey of *Lycaeides idas nobokovi* (Lepidoptera, Lycaenidae) in Michigan	ISRO
	The Northern Blue butterfly is listed as threatened by the Michigan DNR, as is its larval host, dwarf bilberry (*Vaccinium cespitosum*). Added a new butterfly species to the Isle Royale fauna, the common wood nymph, *Cercyonis pegala nephele* .			
41	Needham, James G.	1909	Neuropteroid insects from Isle Royale, Michigan; IN: Adams, Charles C (editor) 1909 an ecological survey of Isle Royale, Lake Superior Michigan Geological Survey, annual report for 1908 Wynkoop Hallenbeck Crawford Co, Lansing, MI 468 p	ISRO
	A listing of aquatic larvae species collected in 1905 (?) including dragonflies, stoneflies, and mayflies.			
42	Nielsen, Mogens	1983	Collecting Lepidoptera on Isle Royale; Newsletter of the Michigan Entomological Society	ISRO
	Contains a list of 31 butterflies and 13 moths collected on Isle Royale during a 1982 summer trip. Includes record of *Oeneis macounii* , the Macoun's Arctic. Article states that the specimens were deposited in the insect collection at Michigan State University.			
43	Nielsen, Mogens C.	1983	Preliminary checklist of the butterflies and skippers, of Isle Royale National Park	ISRO
	Listing of butterflies and skippers found on Isle Royale during a six day collecting trip in 1982.			
44	Nielsen, Mogens C.	1983	Preliminary checklist of the butterflies and skippers, of Isle Royale National Park	ISRO
	A list of the Lepidoptera found on Isle Royale through 1983.			
45	Nielsen, Mogens	1987	Return visit to Isle Royale; newsletter of the Michigan Entomological Society	ISRO
	Lists 32 species of butterflies and moths collected on Isle Royale National Park in 1986 including interesting field notes. Specimens collected were deposited with the lepidoptera collection at Michigan State University.			
46	Nielsen, Mogens C., Ferge, L. A.	1982	Observations of *Lycaeides argyrognomon nabokovi* in the Great Lakes region (Lycaenidae); Journal of the Lepidopterists' Society	ISRO
	no abstract available			
47	Nielsen, Mogens C., Herig, Terry L., Herig, Terry L.,	1986	Investigators annual report 1986	ISRO
	Notes confirmation of the habitat of the Northern Blue butterfly (*Lycaeides idas* (*argyrognomon*) *nabokovi*) which oviposits on dwarf Bilberry (*Vaccinium cespitosum*). Both the plant and butterfly are being placed on the state's endangered-threatened species list.			
48	Nilles, Eric	1993	Emeralds, pygmies, skimmers, and snaketails: rare dragonfies in Wisconsin; Niche	SACN
	This cover article contains information about rare dragonflies found in the state, including the St. Croix Riverway. One species, the St. Croix snaketail, is confined to only three locations--two of these on the Riverway. The article outlines the animal's taxonomy, biology, status and range. Also given is information about the Bureau of Endangered Resources, and how data collected is used.			
49	Pearce, Timothy, Nielsen, Mogens, Rogers, Elizabeth	1992	Survey for listed invertebrate species along the Proposed Beaver Rim Road in the Pictured Rocks National Lakeshore	PIRO
	Terrestrial invertebrates were collected along the corridor of the proposed Beaver Basin Rim Road in Pictured Rocks National Lakeshore, MI to assess the impact that the road might have on the habitats of threatened, endangered, and special concern species of gastropods and insects. Sampling took place over 3 days in late July when the weather was dry and on 2 days in late September during rainy weather. Live and dead gastropod shells were collected from 34 sites in 5 habitat types (northern hardwoods, mixed deciduous/coniferous forest, cedar swamp, pine-dominated or grassy plains, and marshes). The insect survey was timed to coincide with the flight season of the threatened northern blue butterfly. Ultraviolet light attractant was used 1 night in July in an open pine barren, but no listed insects were found. A taxonomic list is presented of the gastropods collected. No list is provided of the insects collected. A map indicating the location of sampling sites in the corridor of the proposed road is included. Information is also included about each endangered, threatened, and special concern insect species that might be present in Pictured Rocks National Lakeshore.			

50	Perry, James, Holm, Chris	1989	Improved water quality monitoring for decision-making in the St Croix and Namakagon Rivers: an assessment based on riverine hierarchies	SACN
	The study sets out to assess water quality indicators on the Riverway, including macrobenthic invertebrates, mussels, and microbes. Also included are abiotic influences on river quality, and the interrelationship with riverine fauna. A detailed list of references, outlines of budgets, and cover letters are furnished.			
51	Pictured Rocks National	no date	Collection of slide transparencies	PIRO
	The collection of slide transparencies at Pictured Rocks National Lakeshore, MI is comprised of approximately 4,186 different slides about natural resource subjects. They illustrate geologic features, soils, erosion, aquatic habitats, woody plants, herbaceous plants, non-flowering plants, birds, mammals, reptiles, amphibians, fish, insects, other invertebrates, and research and monitoring programs. Included in the collection are maps, aerial photographs, and management plans in slide transparency format. Most (2,604) are accessioned and exist in duplicate form. Approximately 1,582 are not yet accessioned, but are labeled in slide boxes.			
52	Premo, Bette J.	1992	Beaver Basin Rim Road corridor: assessment of potential occurrence of invertebrate species listed by US Fish and Wildlife Service or State of Michigan as endangered, threatened or special concern	PIRO
	A search of the literature concerning the distribution of invertebrates that are listed by the state and/or federal governments as threatened, endangered, or of special concern was conducted to determine which species might occur in Pictured Rocks National Lakeshore, MI. The results were used in the environmental impact statement concerning the effect that the proposed Beaver Basin Rim Road might have on their populations. Habitat descriptions were taken from Premo and Davis (1990) for a 12.2 mi. strip of land 1/2 mi. wide between Legion Lake and Twelvemile Beach Campground. The vegetation communities in this area were compared to habitats of endangered, threatened, and special concern invertebrate species known to occur in this region. One endangered species and 15 threatened species are listed, along with distribution records for each. None is recorded having been collected in Pictured Rocks National Lakeshore.			
53	Rice, Heidi K.	2002	Bats, insects, and islands: predator-prey interactions and the effect of island size on abundance and species richness; Western Great Lakes research conference	SLBE
	Bats and insects at Sleeping Bear Dunes National Lakeshore were identified and the effects of island distance and size on prey availability, predator diversity, and predator diet were studied. Methods used included trapping insects, netting bats, using ultrasonic detectors to monitor bat activity, and analyzing bat feces. Data were collected on North and South Manitou Islands and the mainland.			
54	Roberts, Richard H.	1992	1992 investigators annual report: collect and identify deerflies and horseflies (Tabanidae)	ISRO
	Presents a list of 3 Tabanidae species collected in the vicinity of Isle Royale.			
55	Roberts, Richard H.; Loope,	1992	No title	PIRO
	Horse flies and deer flies (Family Tabanidae) were collected over 7 days in the summer of 1991 at Pictured Rocks National Lakeshore, MI. Fourteen species of deer flies and 9 species of horseflies were recorded. Number of each species collected and kept are noted, as well as the sex.			
56	Roberts, Richard; Lanane	1988	No title	PIRO
	Horse flies and deer flies (Family Tabanidae) were collected during the summer of 1991 at Pictured Rocks National Lakeshore, MI. Thirteen species of deer flies and 13 other species were recorded. Number of each species collected and kept are noted, as well as the sex.			
57	Ruthven, Alexander Grant	1906	Spiders and insects from the Porcupine Mountains and Isle Royale, Michigan; IN: Adams, Charles C (editor) an ecological survey in Northern Michigan a report from the University Museum, University of Michigan, published by the State Board of Geological Survey as part of the report for 1905	ISRO
	Lists of spider species, butterfly and moth species, and ant species collected by the University of Michigan survey party in 1904 on Isle Royale.			

58	Sanders, Nell Jackson, Shelford, Victor E.	1922	A quantitative and seasonal study of a pine-dune animal community; Ecology	INDU
	This is a study of the animal population (largely insects) for a pine hollow region within the Indiana Dunes National Lakeshore. The study examined quantity of the animal population and the correlation of local, especially vertical, animal distribution with temperature and evaporation. Animal collections were made and temperature and evaporation recorded in a variety of ground levels. There are lists of the number and type of animal species collected for each sampling level. Correlations were made of species and habitat types for given time and weather parameters.			
59	Schweitzer, Dale F.	1992	The status of the Karner blue butterfly (*Lycaeides melissa samuelis* Nabokov) at Indiana Dunes National Lakeshore, with special consideration of planning of prescribed burns at major	INDU
	Mark-release-recapture estimates and walk-through censuses were conducted at Indiana Dunes National Lakeshore to determine the size of the Karner blue butterfly population. Suggestions are made for future prescribed burn management.			
60	Selgeby, James H.	1974	Immature Insects (Plecoptera, Trichoptera and Ephemeroptera) collected from deep water in western Lake Superior; Journal of the Fisheries Research Board of Canada	ISRO
	Five species of aquatic insects - two splectoperans, two trichopterans, and one ephemeropteran - usually found in streams or ponds were collected in water 32-100 m deep in western Lake Superior near the Apostle Islands. All appear to be new records for the lake and all were collected from far greater depths than previously recorded for these forms.			
61	Shuey, John	1997	Definitive destination: Northwest Indiana's lakeshore communities; American butterflies	INDU
	The article describes the types of butterfly habitats found in northwest Indiana, including Indiana Dunes National Lakeshore. Specific butterfly viewing sites are described.			
62	St. Croix National Scenic Riverway	1989	Butterfly mussel species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made from 1987 to 1989. The butterfly (*Ellipsaria lineolata*) is an uncommon species along the Riverway. It is listed as endangered in Wisconsin. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this freshwater mussel (biology, ecology, etc.).			
63	Stanforth, Lynn M., Louda, Svata M., Bevill, Robert L.	1997	Insect herbivory on juveniles of a threatened plant, *Cirsium pitcheri* , in relation to plant size, density and distribution; Ecoscience	SLBE
	Results of a study of insect feeding on Pitcher's thistle (*Cirsium pitcheri*), a rare plant, endemic to dunes around the Great Lakes. The study was conducted in Sleeping Bear Dunes National Lakeshore. Looked at the frequency, magnitude and impact of feeding relative to plant size and age and to location along the lakeshore to dune continuum, and at the impact of feeding on plant population dynamics (particularly how it affected the plant's time to maturity).			
64	St. Croix National Scenic	1994	Monitoring projects - 1994	SACN
	Contained here are work plans for the 1994 field season. Monitoring for listed and exotic species are included. The endangered or threatened species include the Karner blue butterfly and gray wolf. Exotic species monitoring was planned for zebra mussels, purple loosestrife and gypsy moths. Also mentioned in the general plan (no work plans included here) are the trumpeter swans and bald eagles. Maps of gypsy moth trapping locations are provided.			
65	St. Croix National Scenic	1996	Species list: dragonfly (Namekagon)	SACN
	This file hold a checklist of dragonflies found along the riverway and in each district. All checklists are completed by taxonomy and locations are provided on all lists. An article on proposed English names for North American dragonflies is included, as is a paper on a new species found on the river.			
66	St. Croix National Scenic	1996	Species list: invertebrates	SACN
	This is a summary checklist of aquatic insects collected in the river during August of 1995. The survey was done by the Wisconsin Department of Natural Resources. Three locations were studied and results are provided by taxonomic listing.			

67	Szczytko, Stanley	1995	1995 investigators annual report: stoneflies (Plecoptera) of Isle Royale National Park	ISRO
	Though no stoneflies were found, this report includes a list of other aquatic insects that were collected from the outflow of Hatchet Lake on Isle Royale, including dragonflies and damselflies, mayflies, caddisflies, and true flies.			
68	Titus, E.G., Adams, Charles C.	1909	Annotated list of Isle Royale Hymenoptera; an ecological investigation of Isle Royale, Lake Superior	ISRO
	A list of Hymenoptera species collected on Isle Royale.			
69	Troelstrup, Nels H. Jr., Perry, James	1991	Assessing ecological integrity across spatial and temporal scales: biomonitoring on the St Croix Scenic Riverway	SACN
	The authors propose to create a system to monitor the water quality of the Riverway, by examining biological integrity. Areas of study include river sections, reaches, segments, and watersheds. Periods of as few as several days to as long as a century are examined. Several groups of fauna are sought after and the affects of biochemistry explored during the monitoring process. Microbes, aquatic invertebrates--including insects and mussels--and fishes are all used in various ways to assess the health of the Riverway.			
70	Van Buskirk, Josh	1990	Density-dependence and population regulation in dragonflies	ISRO
	For animal populations to persist for more than a few generations it is necessary for density-dependent mechanisms to regulate population size, decreasing individual performance at high density and improving performance at low density. This dissertation describes sources of density-dependence in larval dragonflies (insect order Odonata) that could contribute to population regulation. The study population was the dragonfly *Aeshna juncea* inhabiting splash pools on the shores of Isle Royale National Park.			
71	Van Buskirk, Josh	1990	Factors controlling the larval distribution of the arctic blue darner at Isle Royale, Michigan	ISRO
	no abstract available			
72	Van Buskirk, Josh	1992	Competition, cannibalism and size class dominance in a Dragonfly; OIKOS	ISRO
	This paper reports the consequences of size class interactions among larvae of the dragonfly *Aeshna juncea* inhabiting splash pools on the shores of Isle Royale, in Lake Superior. This dragonfly has a three-year life cycle, and there was a close correspondence between age and size classes. Observations of dragonfly behavior and samples of fecal contents both suggested that larvae were aggressive toward conspecifics and that cannibalism was common. Experiments in plastic containers and natural pools demonstrated that two-year-old dragonflies were more secretive and experienced higher mortality in the presence of larger three-year-old larvae. Small larvae in the field avoided encountering large larvae by feeding more often in the day and by reducing their activity. The lower activity levels of small larvae entailed a cost of reduced feeding success. There was a striking two-year cycle in the age structure of the natural pools, suggesting that only adjacent year classes interacted strongly. These results show how competition influences the behavior, larval performance, and population size structure of *Aeshna juncea* at Isle Royale.			
73	Van Buskirk, Josh	1992	The Odonata of Isle Royale, Michigan; The Great Lakes Entomologist	ISRO
	This paper presents a list of the Odonata recorded from Isle Royale National Park. Collections from Isle Royale include 38 species of Anisoptera and 12 species of Zygoptera and a listing of these species is given in the report. The author made repeated samples of larval odonates using a dip net in 22 ponds, bogs, and streams in northeastern Isle Royale. The list is typical of the boreal regions of North America, and includes nine new records for Isle Royale (*Aeshna clepsydra* , *Aeshna juncea* , *Leucorrhinia glacialis* , *Libellula pulchella* , *Pantala flavescens* , *Sympetrum costiferum* , *Sympetrum danae* , and *Sympetrum semicinctum*) and one new record for the state of Michigan (*Aeshna juncea*). *Aeshna juncea* is an abundant dragonfly in the High Arctic; at ISRO the larvae are common in small splash pools along exposed shores of Lake Superior. Isle Royale is one of the southernmost localities of this dragonfly in North America.			

74	Van Buskirk, Josh	1993	Population consequences of larval crowding in the dragonfly *Aeshna juncea* ; Ecology	ISRO
	The author studies sources of density dependence in a dragonfly population to reveal how population size is controlled. Larvae of the dragonfly inhabiting rock pools on the Lake Superior shoreline at Isle Royale, showed clear evidence of competition when natural densities were high. After 2 yr of larval growth, individuals in crowded pools were developmentally delayed and survived less than individuals in sparsely populated pools. The stunted larvae caught up with individuals in less crowded pools, but even so their final body size remained relatively small. A 5-wk field experiment in natural pools showed the causal connection between density and fitness: feeding activity and growth rates were significantly reduced under crowded conditions. In unmanipulated rock pools, however, natural increases in density from one year to the next were met with slightly overcompensatory decreases in annual survival. The results illustrate that density dependence operates in a way that could contribute to population regulation in *A. juncea* .			
75	Van Buskirk, Josh	1995	Letter to Jack Oelfke, Resource Management Specialist, ISRO	ISRO
	A graph showing nine years of population numbers for *Aeshna juncea* on two study areas at Isle Royale. This figure is a rather simple summary that ignores a lot of interesting patterns and results, but it does show the overall dynamics of this dragonfly on two of the perhaps 7-12 islands where it occurs in the park.			
76	various compilers	1994	Vegetation data on beetle release site for biological control of purple loosestrife	INDU
	These data sheets provide information on Purple loosestrife (*Lythrum salicaria*) stem counts in study plots prior to a biological control release project. In four study plots, total stem counts and herbivory on each plant were recorded before and after the release of loosestrife-eating beetles.			
77	various compilers	1996	Maps of Olympia marblewing sightings	INDU
	Topographic maps indicating sightings of rare Olympia marblewing butterfly. Areas surveyed include West Beach and Inland Marsh.			
78	Voss, Edward G.	1965	Letter to M C Nielsen of Lansing, Michigan	ISRO
	This letter contains a listing of Lepidoptera collected on Isle Royale in June of 1965. Specimens were placed in the collection of the University of Michigan Museum of Zoology.			
79	Wangberg, J.K.	1973	*Diastrophus kincaidii* Gillette (Hym, Cynipidae) and insects associated with its gall on thimbleberry (*Rubus parviflorus* Nuttall)	ISRO
	no abstract available			
80	Wangberg, J.K.	1975	Biology of the thimbleberry gallmaker, *Diastrophus kincaidii* (Hymenoptera: Cynipidae); Pan-Pac Entomol	ISRO
	no abstract available			
81	Wheeler, William Morton	1909	The ants of Isle Royale Michigan; IN: Adams, Charles C (editor) 1909 an ecological survey of Isle Royale, Lake Superior Michigan State biological survey report for 1908 Wynkoop Hallenbeck Crawford Company, Lansing, MI 468 p	ISRO
	Contains a description of ant species collected on Isle Royale.			
82	Willson, Ron	1964	Letter to Mr. William Dunmire, Chief Park Naturalist, Isle Royale National Park	ISRO
	Lists two butterflies collected from Isle Royale in 1964: *Oeneis macounii* Edwards (Satyridae), not collected since 1939; and *Euchloe ausinodes* (Pieridae), a new state record.			
83	Willson, Ronald B.	1965	Aquatic and semiaquatic insects from Isle Royale in the Michigan State University Entomology Museum	ISRO
	A listing of records available on the aquatic and semiaquatic insects of Isle Royale that are deposited in the Michigan State University collection.			

84	Wisconsin Department Of Natural Resources	1991	Surveys of rare animals: Karner blue butterfly (*Lycaeides samuelis*) and Kirtland's Warbler (*Dendroica kirtlandi*)	SACN
	Survey of Karner Blue butterfly (on federal list of endangered species) along the lower reaches of the Riverway; survey of Kirtland's Warbler will focus on the pine barrens bordering the upper Riverway.			

LAND COVER

1	author unknown	1979	Land use and land cover and associated maps for Ashland, Wisconsin, Michigan, Minnesota; Geological Survey open file report	SACN
	no abstract available			
2	author unknown	1979	Land use and land cover and associated maps for Stillwater, Minnesota, Wisconsin; Geological Survey open file report	SACN
	no abstract available			
3	author unknown	1980	Land use and land cover, 1976, Stillwater, Minnesota; Wisconsin; land use land cover maps, L Ser	SACN
	no abstract available			
4	author unknown	1980	Land use and land cover and associated maps for Duluth, Minnesota, Wisconsin; (Geological Survey 1978) open file report	SACN
	no abstract available			
5	author unknown	1980	Land use and land cover, 1976, Ashland, Wisconsin; Michigan; Minnesota; land use land cover maps, (United States Geological Survey) open file report	SACN
	no abstract available			
6	author unknown	1982	Land use and land cover and associated maps for Rice Lake, Wisconsin; (United States Geological Survey) open file report	SACN
	no abstract available			
7	author unknown	1982	Land use and land cover and associated maps for International Falls, Minnesota; U S Geological Survey open file report	SACN
	no abstract available			
8	author unknown	1983	Land use and land cover and associated maps for Eau Claire, Wisconsin; Minnesota; Geological Survey open file report	SACN
	no abstract available			
9	author unknown	1983	Land use and land cover and associated maps for Cheboygan, Michigan; Geological survey open file report	SLBE
	no abstract available			
10	author unknown	1983	Land use and land cover and associated maps for Traverse City, Michigan; U S Geological Survey open file report	SLBE
	no abstract available			
11	Burns & McDonnell Engineers-Architects-Consultants	1995	Environmental resource inventory for the Upper Mississippi River, Lower Missouri River and major tributaries	MISS
	The report provides an inventory of the natural resources in the floodplains of the Upper Mississippi and Lower Missouri River basins as part of the Floodplain Management Assessment (1995). Data was gathered from databases, literature, and agency contacts. Information was collected on soils, land use/land cover, threatened and endangered species, aquatic resources, fisheries, wildlife, Fish and Wildlife Management Areas, natural areas, and recreation areas. The impacts of flooding on natural resources are also discussed.			
12	Dunevitz, Hannah	1996	St. Croix River stewards fact sheet: what did the St. Croix Valley look like 200 years ago?	SACN
	This short data sheet outlines the work of the Minnesota County Biological Survey (Minnesota Department of Natural Resources) along the St. Croix Valley. An overview of the significant biological features of the watershed, conservation efforts, and details about the survey and additional information are presented. Side-by-side land cover maps offer a dramatic look at the loss of native vegetation on the Minnesota side of the St. Croix watershed.			

13	Great River Greening	no date	National Park Service islands inventory results	MISS
	The report describes the vegetation cover types found on the National Park Service islands in the Mississippi National River and Recreation Area during a September 2002 ecological inventory. Aerial photos and lists of plant species for each island are included.			
14	Johnston, Carol A., Bonde, John	1989	Quantitative analysis of ecotones using a geographic information system; photogrammetric engineering and remote sensing	VOYA
	"GIS techniques were developed and evaluated for analyzing ecotones, zones of transition between adjacent ecological systems. Raster-based GIS techniques were used with remotely sensed data to detect, classify and measure ecotones. The ecotones of six general land cover classes were identified using a moving window GIS technique to scan a classified 324 km2 Landsat thematic mapper image of north central Minnesota." (excerpt from authors' abstract)			
15	Pitt, David G., Neckar, Lance, Richardson, Bart, Anderson, Veronica, Westrum, Vera, Smith, Lynette, Ma, Xaio-wei	1994	Technical completion report for deliverable C.3: identification of visual character types in the lower St. Croix National Scenic Riverway and evaluation of the impact of land use change on the riverway's visual character	SACN
	The main objective of this study plan is to map and analyze the nature and distribution of landscape character changes that have occurred in the Riverway since 1976 and to determine what affects those changes have had on the visual character of the river.			
16	U.S. Army Corps of Engineers	1995	Floodplain management assessment of the Upper Mississippi River and Lower Missouri Rivers and tributaries	MISS
	A costly flood disaster in 1993 in the Upper Mississippi and Lower Missouri River basins led to the re-evaluation of methods used in floodplain management and control. The report describes the study aimed at assessing the effectiveness of floodplain management in these two river basins. Objectives included describing the land and water resources in the basins and the impacts on those resources. The alternatives for floodplain management are discussed.			

LICHEN

1	Albrecht, Nancy Jean	1987	Temporal variation in the elements of three lichen species of Voyageurs National Park	VOYA
	Three species of lichens, *Cladina rangiferina, Parmelia sulcata* , and *Evernia mesomorpha* were collected on a monthly basis for two years in Voyageurs National Park, Minnesota. Data from the first twelve months indicated that few, if any, seasonal changes in lichen element content (P, K, Ca, Mg, Al, Fe, Na, Mn, Zn, Cu, B, Pb, Ni, Cr,Cd, S) occurred. Although significant month-to-month differences did occur in several elements, these were not correlated with available weather and wet deposition data. The three species showed no correlation for any given element for the twelve month period. This observation was discussed in the context of potential microhabitat and/or physiological differences between the three species.			
2	Bennett, James P.	1995	Abnormal chemical element concentrations in lichens of Isle Royale National Park; Environmental and Experimental Botany	ISRO
	This study of two lichen species, *Hypogymnia physodes* and *Evernia mesomorpha* , in Isle Royale compares the concentrations and ranks of elements with the concentrations and ranks of the elements in the earth's crust, changes in element concentrations over a nine year period, and the geography of element concentrations in the park. Sulfur, Zn, Pb, Cd and Se were all elevated in both species and higher in rank compared to the concentrations and ranks in the earth's crust. Toxic elements increased 123% in *Hypogymnia* and 62% in *Evernia* over nine years, compared to increases of 45% and 59% for non-toxic elements in each species respectively. Geographically, the lichens at certain localities with higher exposures experienced higher than average element concentrations. Finally, tissue concentrations of Mn, S and Se at some localities are above levels known to be either toxic or similar to those found in polluted areas. These four lines of evidence suggest that Isle Royale National Park is experiencing the onset of chronic air pollution stress from a number of sources.			
3	Bennett, James P., Loope, Walter L.	1992	Chemical analyses of lichens from collection along a hypothetical pollution gradient, Pictured Rocks National Lakeshore	PIRO
	no abstract available			
4	Bennett, James P., Loope, Walter L.	1993	Element concentrations in three lichens at Pictured Rocks National Lakeshore	PIRO
	Three species of lichens, *Cladina rangiferina* (reindeer lichen), *Evernia mesomorpha* , and *Hypogymnia physodes* , were collected from 4 locations in Pictured Rocks National Lakeshore. This is the first follow-up monitoring of element concentrations in lichen thalli (body) since an initial study by Wetmore (1988). Whole thalli of each species, enough to fill a 12" x 7" cloth soil bag, were collected from each location. *Cladina rangiferina* specimens were collected from the ground, and *Evernia mesomorpha* and *Hypogymnia physodes* were collected from maple (*Acer*) and pine (*Pinus*) tree branches. Samples were analyzed for concentrations of 20 elements (Al, B, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, P, Pb, S, As, Co, Mo, Se, and Zn) using a spectrophotometer. Data on concentrations of the elements were analyzed using analysis of variance. Results were analyzed and compared to those of Wetmore (1988). Seven elements were considered at background levels, 9 at moderate levels, and 4 (As, Pb, Mg, and Se) at high levels.			
5	Bennett, James P., Thomson, John W., Will-Wolf, Susan	1990	Lichen survival at Indiana Dunes National Lakeshore (scope of work)	INDU
	This scope of work contains tasks to carry out the objective of determining whether air pollution is or is not a factor in lichen distribution and diversity. The hypothesis that air quality is no longer a factor in lichen survival at the Indiana Dunes National Lakeshore was to be tested by following the performance and survival of healthy lichens that would be transplanted into the park. Recommendations could then be developed for restoration of the original lichen flora if needed. A criterion for species of lichens to be transplanted is given, along with a description of response measures to be used.			
6	Bennett, James P., Van Stappen, Julie	1996	Abnormal chemical element concentrations in lichens of Isle Royale National Park. Abstract in Proceedings of the Lake Superior National Parks research conference	ISRO
	This study of two lichen species, *Hypogymnia physodes* and *Evernia mesomorpha* , in Isle Royale National Park, compares the concentrations and ranks of elements with the concentrations and ranks of the elements in the earth's crust, changes in element concentrations over a nine year period, and the geography of element concentrations in the park. Evidence suggests that Isle Royale National park is experiencing the onset of chronic air pollution stress from a number of sources.			
7	Bennett, James P., Wetmore, Clifford M.	1996	Chemical element concentrations in four lichens on a transect entering Voyageurs National Park	VOYA
	A three factor transect study was conducted to test the hypothesis that air emissions in the vicinity of International Falls, Minnesota could be detected in lichens along a 24 km transect reaching into Voyageurs National Park.			

8	Bennett, James P., Wetmore, Clifford M.	2004	Elemental changes in *Punctelia rudecta* in St. Croix National Scenic Riverway over thirteen years; Third annual western Great Lakes research conference: Abstracts	SACN
	The lichen species *Punctelia rudecta* was sampled from the St. Croix National Scenic Riverway and analyzed for 16 elements in 1990 and again in 2003 to determine the changes in air quality in the park.			
9	Brodo, Irwin M.	1967	Lichens collected in Wisconsin on the 1965 foray of the American Bryological Society; The Bryologist	APIS
	An excursion to one locality in the Driftless Area of southern Wisconsin and to several in Ashland and Bayfield Counties of northern Wisconsin resulted in the collection of 234 species of lichens. The southern locality, a calcareous sandstone bluff, yielded 93 species, many of them characteristic of dry lime-rich conditions. Maple-birch forests, grading into spruce-fir, characterized the northern localities where 183 species were collected. One species, *Arthonia granosa B.* de Lesd. , is new to North America, and two new combinations, *Micarea gelatinosa* (Florke) and *M. viridescens* (Schrad.) are made.			
10	Fink, B.	1896	Contributions to a knowledge of the lichens of Minnesota (3) - the rock lichens of Taylors Falls; Minnesota Botanical Studies	SACN
	Provides identification and life cycle information concerning the lichens found in the Taylors Falls area. This area has dramatic geologic features which provide good habitat for lichens. Lichens are used as pollution indicators, as they are highly sensitive to air quality.			
11	Fink, Bruce	1910	XVIII Contributions to a knowledge of the lichens of Minnesota VII lichens of the northern boundary; Minnesota Botanical Studies	VOYA
	In 1901, a survey of the lichens of northern Minnesota was conducted. Three hundred and twelve species were identified and collected. This paper presents a list of these species with narratives that include species locations that are now within Voyageurs National Park boundaries.			
12	Hedrick, Joyce, Lowe, J. L.	1936	Lichens of Isle Royale, Lake Superior; The Bryologist	ISRO
	Record of 296 lichen species collected within the conifer forest zone of the northeastern part of Isle Royale by members of the University of Michigan Botanical Survey Party of 1930.			
13	Heiman, Karin A., Apfelbaum, S. I.	1984	Initial lichenological investigations and establishment of a monitoring program for the Indiana Dunes National Lakeshore, Porter, Indiana	INDU
	This report summarizes the first study of lichens for the Indiana Dunes National Lakeshore. The report gives a brief history of the area, and a description of the dune region. Lichens from study trees at Miller Woods, the Visitor Center, West Beach, and the easternmost region of the park were sampled. Lists of lichen species collected is given, along with lists of cover and frequency for all lichens sampled, and species of trees in the study areas. A permanent monitoring base for future study was also established. A summary of lichen species found, and related ecological data is provided, with recommendations for future study and management.			
14	Michigan Natural Features Inventory	1990	Alger County element list	PIRO
	The list includes federal and state listed species as well as plant communities and geological features of concern. All species, communities, and features either currently exist or historically existed in Alger County.			
15	Michigan Natural Features Inventory	1994	Alger County element list	PIRO
	The 1994 checklist identifies vascular plants, plant communities, vertebrate animals, invertebrate animals, and physical features that are endangered, threatened, of special concern, or considered appropriate for preservation (but are as yet unlisted) in Alger County, MI. Twenty-eight vascular plant species, 7 plant communities, 8 vertebrate species, 3 invertebrate species, and 13 geologic features are included. Some of the plants listed grow on the Grand Sable Dunes of Pictured Rocks National Lakeshore, MI.			
16	Peoples, Avery Glenn	1972	The effect of SO2 emission on populations of four lichen species	PIRO
	no abstract available			
17	Schuster, James	1985	Lichens of Pine County	SACN
	Taxonomic survey of lichens of Pine County, Minnesota. Includes survey work at St. Croix State Park and on nearby islands in the St. Croix River.			

18	Schuster, James	1990	Lichen floristic studies in Washington and Chisago Counties, Minnesota	SACN
	Work includes a population census of lichens in Washington and Chisago Counties, developing a list of species present in the counties and their distribution. Information was provided to the Minnesota Department of Natural Resources for its County Biological Surveys.			
19	Schuster, James	1991	Lichen survey at Crex Meadows Wildlife Area, Burnett County, Wisconsin	SACN
	Research includes a survey of lichens at Crex Meadows, to catalog the species present and their distribution. Research will be provided to the Wisconsin Department of Natural Resources and Crex Meadows staff.			
20	Thomson, J.W.	1954	Lichens of the 1951 Foray to the North Shore of Lake Superior; Bryologist	ISRO
	no abstract available			
21	Thomson, John	1976	Lichens collected on Stockton Island, Apostle Islands, October 9, 1976	APIS
	List of lichens collected on Stockton Island, Apostle Islands National Lakeshore Oct. 9, 1976.			
22	U. S. Geological Survey	no date	Lichens of Voyageurs National Park	VOYA
	Includes U.S.G.S. topo maps with lichen specimen locations penciled in. Specimens were collected by Clifford Wetmore.			
23	Various Compilers	no date	Collection of lichens and mosses	INDU
	Lichens and mosses collected from the Indiana Dunes National Lakeshore and surrounding areas are located in the herbarium. For each sample, there is information on its common and scientific name, collector, and location and date of collection.			
24	Wetmore, Clifford M.	1978	Bruce Fink's lichen collections in Minnesota; The Michigan Botanist	VOYA
	"Between 1896 and 1902, Bruce Fink collected about 5,500 lichens throughout the state of Minnesota for his PhD degree and as part of the Botanical Survey of Minnesota. A complete set of these collections is in the University of Minnesota herbarium and a representative set is in his personal herbarium, now owned by the University of Michigan. This report is presented to supplement the label data on his collections to aid in future reference to them." (from author's intro)			
25	Wetmore, Clifford M.	1980	Lichens of Voyageurs National Park	VOYA
	A complete inventory of the lichen flora in Voyageurs National Park was conducted in order to provide a listing for the park to use in formulating development plans. Since lichens are extremely sensitive to habitat changes, particularly air pollution, the data will also provide a baseline from which to determine if development, both inside and outside park boundaries, degrades the quality of air and precipitation. Over 8,000 lichens of 403 taxa were collected at 128 different localities during 11 weeks in 1978 and 1979. Several areas of special interest to the lichen flora are noted. Numerous new state records were found within these collections and all but seven of the species collected by Bruce Fink in 1901 were recollected. Some of the rare lichens noted are probably rare because of the logging and forest fires during the past 80 years. The scarcity of the orange lakeshore lichen, *Xanthoria elegans* , was studied and is probably due to lack of wave splash. The lichen flora is rich in fruticose lichens, which suggests that no air pollution is present. Recommendations are presented regarding the location of campsites and trails, and establishment of more detailed monitoring programs using the lichens.			
26	Wetmore, Clifford M.	1982	Lichen decomposition in a black spruce bog; The Lichenologist	VOYA
	Nylon mesh litter bags containing six various lichen species were placed on the floor of a black spruce bog in northern Minnesota to study the rates of decomposition. Most of the lichen species had completely decayed after 13 months and species with usnic acid decayed as rapidly as those without.			
27	Wetmore, Clifford M.	1984	1984 investigators annual report - lichens and air quality in Isle Royale National Park	ISRO
	Includes information on new lichen records for the park's flora: *Pseudocyphellaria crocata, Lobaria scrobiculata* , and *Cetraria nivalis* .			
28	Wetmore, Clifford M.	1984	Lichens and air quality in Voyageurs National Park - final report, chemical analysis supplement	VOYA
	This supplemental report presents the chemical analysis data on lichens collected from four localities within Voyageurs National Park. This analysis data was not available when the original report was submitted (See NRBIB Record # 30) Concentrations of P, K, Ca, Mg, Al, Fe, Na, Mn, Zn, Cu, B, Pb, Ni, Cr, Cd, and S are presented for each sample.			

29	Wetmore, Clifford M.	1985	Lichens and air quality in Isle Royale National Park - final report	ISRO
	The objectives of this study were to survey the lichens of Isle Royale National Park, produce a lichen flora, collect and analyze lichens for chemical contents and evaluate the lichen flora with reference to the air quality. This study establishes baseline data for future restudy and determines the presence of any air quality problems as might be shown by the lichens at the time of the study. The report contains a listing of all lichen species (482 species) found on Isle Royale and indicates each species' sensitivity to sulfur dioxide. The report also contains the results of chemical analysis (of five different lichen species from ten differing localities in the park) for sixteen elements; all were within typical limits. However, the elemental analyses do show abnormal accumulations of polluting elements at some localities, especially on the ridgetops of the northeastern half of the island. Chemical analysis shows that there is sublethal sulfur pollution in the park that bears monitoring.			
30	Wetmore, Clifford M.	1986	Lichens and air quality in Indiana Dunes National Lakeshore - final report	INDU
	This report lists all lichen species known from the Indiana Dunes National Lakeshore, gives species lists from several areas, and evaluates the impacts of air pollution on the lichen flora. Lichens were surveyed at the park, collected, analyzed for chemical contents and evaluated with reference to air quality. Species lists for individual localities are included, along with maps indicating locations where each species was found. An executive summary at the beginning of the report includes management recommendations.			
31	Wetmore, Clifford M.	1988	Lichens and air quality in Apostle Islands National Lakeshore	APIS
	Lichens of Apostle Islands National Lakeshore were surveyed, a lichen flora was produced, and lichens were collected and analyzed for chemical contents and evaluated with reference to air quality. This study established baseline data for future restudy. There is no indication that the lichens of Apostle Islands NL are being damaged by air quality. The lichen flora is quite diverse and the areas with greater diversity are more due to vegetation and substrate than air patterns. There is no impoverishment of the lichen flora in any part of the park. The maps of the distributions of the more sensitive species do not show any significant voids that are not due to normal ecological conditions. There is no evidence of damaged or dead lichens in any area where healthy ones are not also present. The elemental analyses do not show abnormal accumulations of polluting elements at any locality.			
32	Wetmore, Clifford M.	1988	Lichens and air quality in Pictured Rocks National Lakeshore - final report	PIRO
	Lichens were collected from 24 locations at Pictured Rocks National Lakeshore, MI and from Kingston Lake near the lakeshore boundary. Sampling locations included various vegetation types throughout the park and targeted sites expecedt to be rich in lichens. Collections were made from disturbed and undisturbed areas. At some locations additional lichen thalli (bodies) were collected for chemical analyses. Field observations were made concerning the general health of the lichens. A species list includes 235 taxa with notes concerning the species' sensitivities to sulfur dioxide. The 13 species that are the most sensitive to sulfur dioxide are listed and discussed. Chemical analyses were done to detect the presence of several elements in 3 species. Specimens were dried and ground before analysis. Determination of levels of Ca, Mg, Na, K, P, Fe, Mn, Al, Cu, Zn, Cd, Cr, Ni, Pb, and B was made by Inductively Coupled Plasma (ICP) Atomic Emission Spectrometry. Sulfur was determined by infrared absorption. The lichen flora in Pictured Rocks National Lakeshore was found to be diverse and not damaged by air pollution.			
33	Wetmore, Clifford, M.	1988	Lichens of Sleeping Bear Dunes National Lakeshore; The Michigan Botanist	SLBE
	Lists 180 taxa of lichen, their relative abundance, and where they can be found in Sleeping Bear Dunes National Lakeshore (SLBE). There is a discussion (distributions, rare species, human influences, and ranges) concerning the taxa listed. A map shows and describes the collecting locations (27 sites) within SLBE. There is a listing of a new record for North America (*Arthonia fuliginosa*) and a significant extension to the range of *Heterodermia obscurata* .			
34	Wetmore, Clifford, M.	1988	Lichens and air qualiy in Sleeping Bear Dunes National Lakeshore - final report	SLBE
	Provides baseline data on the lichen flora in reference to air quality in Sleeping Bear Dunes National Lakeshore (SLBE), Michigan. General observations on the health and distribution of lichen species were noted. Two species collected from 5 locations were analyzed for sulfur or other pollutants. No indication of air pollution was found in the lichen flora of SLBE. There is a list of lichen taxa collected in SLBE, and maps showing the collection locations and the locations of species sensitive to sulfur dioxide.			

35	Wetmore, Clifford M.	1990	Lichens of Apostle Islands National Lakeshore, Wisconsin; Michigan Botanist	APIS
	This report includes a list of 271 lichen species collected in August of 1987. An additional 12 unidentified taxa were collected, some of which are not described. The lichens at different localities in the Apostles are quite variable. On some islands with dense hardwood forests the lichen flora is not diverse but on other islands (especially Devils Island) there are many lichens. The lack of abundant rock outcrops limits the lichen flora significantly. Most of the rock that is available is soft sandstone with only a limited lichen flora. Most of the lichens in the hardwood forests are common further south, but on Devils Island numerous northern species occur. The majority of the species in the park are also known from northern Michigan and northern Minnesota. Some species found only once are rare wherever they are found throughout their distributional range and might be found at other localities with further searching. Others may require special substrates that are rare in the park.			
36	Wetmore, Clifford M.	1991	Lichens and air quality in St. Croix National Scenic Riverway	SACN
	Two-hundred sixty-five species of lichen were collected at 77 sites along the St. Croix National Scenic River. *Parmelia rudecta* samples were collected at ten sites and were used to measure the amount of sulfur and other elements in the lichen tissues. The amount of sulfur absorbed by the lichen sample is an indication of air quality.			
37	Wetmore, Clifford M.	1991	Lichens and air quality in the St Croix National Scenic Riverway	SACN
	A study of lichens collected in 24 locations along the Lower St. Croix was conducted to assess air quality. Species presence and absence is noted, including rare and endangered species. Results of chemical analysis will be presented in the paper. Parts of the park are downwind or near sources of pollution and lichens may indicate the level of air quality. In 1988 and 1990, 2327 collections were made at 77 locations. Some chemical analysis was done on collected material and the general health of lichens was observed. A species list of 265 species collected, including some rare species, is included in the report.			
38	Wetmore, Clifford M.	1993	Lichens and air quality in Voyageurs National Park	VOYA
	Evaluation of lichen flora was done by comparing present lichen flora with historical records and with lichen flora of nearby areas with similar ecological conditions. Species diversity and distribution of sensitive species was also evaluated. This report is based on the previous thorough lichen collecting done in the park by the present author and a restudy of the historical collections made by Fink in 1901. By all methods of analysis of the lichen flora there is no indication of air pollution on the lichens of the park. The lichen flora is diverse, shows no voids in the distributions of the most sensitive species and the flora includes the sensitive species normally found in comparable areas nearby. Suggestions are made for the establishment of permanent plots for quantitative study to provide a more sensitive baseline as further pollution sources become established.			
39	Wetmore, Clifford M.	1994	The lichen genus *Caloplaca* in North and Central America with brown or black apothecia; Mycologia	VOYA
	This paper describes in detail a recently discovered species of rare lichen. Some specimens of this rare lichen occur in parts of Voyageurs National Park and are discussed.			
40	Wetmore, Clifford M., Bennett, James P.	1996	1995 lichen studies in Apostle Islands National Lakeshore	APIS
	This study of Apostle Islands lichens was conducted in two parts. Part one surveyed the lichens on Long Island in all vegetation types, noting the species sensitive to sulfur dioxide and the substrates on which the lichens grew. Part two created collections for elemental analysis on Long Island and at the three localities sampled in 1987, and compared the results of elemental analysis in 1987 with those from 1995. The lichen flora of Long Island is quite diverse with 88 species found, including 14 new species records for the park. There were four species very sensitive to sulfur dioxide. The new species records are mainly due to the abundance of jack pine and red oak. The lichens studied by elemental analysis show normal ranges of all elements in 1995 with no correlation between elements and localities. In comparison of the 1995 data with the 1987 data there are several noticeable changes. Recommendations are made for protection of Long Island, for moving the elemental monitoring site on Raspberry island and for periodic (5 years) restudy.			

41	Wetmore, Clifford M., Bennett, James P.	2001	2000 elemental analysis of lichens in Sleeping Bear Dunes National Lakeshore and George Washington Carver National Monument - final report	SLBE
	Monitoring of air quality through lichen analyses began at Sleeping Bear Dunes National Lakeshore, MI in 1987 (Wetmore, 1988). This second monitoring effort was conducted in August 2000 at the same 3 collection locations as the previous 1987 study. Four lichen species were collected: *Cladina rangiferina, Hypogymnia physodes, Evernia mesomorpha,* and *Parmelia sulcata* . The latter 2 species were added to the lichen flora of the Great Lakes region. Lichen specimens were analyzed for 23 elements and ash. Statistical analyses show that levels of chromium and sodium increased significantly while cadmium significantly decreased. The author discusses the implications of elemental accumulation in lichens of the area, and also provides details of a similar study at George Washington Carver National Monumnet, MO.			
42	Willson, Gary D.	1987	Lichen specimens; lichen collection from Pictured Rocks National Lakeshore, MI	PIRO
	A survey of state and federal listed species was conducted at the Midwest Region National Parks. Literature was consulted and field surveys were conducted to locate rare species in the National Parks and to determine management and research requirements for each species.			
43	Woodruff, Laurel G., Cannon, William F., Dicken, Connie L., Bennett, James P., Nicholson, Suzanne W.	1990	Endangered species survey covers Midwest Region Parks; Park science: A resource management bulletin	ISRO PIRO SLBE
	This is a digital report of geochemical data from various media collected on Isle Royale, a large island in northeastern Lake Superior. Isle Royale became a national park in 1940 and was designated as a wilderness area in 1976. USGS sampling began in 1996 as a part of a larger project on the Midcontinent Rift in the Lake Superior region. Data are given in nine Microsoft Excel spreadsheets. All of the data are newly acquired by the USGS.			

BATS

1	Kurta, Allen, Jablonski, Pat	2000	Final report for *Chiroptera* studies in Sleeping Bear Dunes National Lakeshore	SLBE
	Bat (*Chiroptera*) studies were conducted on 5 separate days in July 2000 at Sleeping Bear Dunes National Lakeshore, MI to identify which species were present and to determine their abundance and roost site preferences. Methods included nocturnal mist netting and searches in older barns and buildings for recent guano. Locations and abundance of species captured are reported by date and location. Of 19 buildings and study sites, 9 yielded more than a few bats. Management recommendations are provided for buildings that may have human activity in and around the buildings in the next few years.			
2	Minnesota Department Of Natural Resources	1986	Distribution and status of bats in Minnesota	SACN
	Population and distribution information was gathered during 1982-85 for the seven species of bats found in Minnesota. Within the St. Croix drainage, evidence of use by four species of bats was found at Leslie Cave, Washington County.			
3	Myers, Philip, Svendsen, Gerald	1990	Survey of mammals along the Beaver Rim Road right-of-way, Pictured Rocks National Lakeshore	PIRO
	Mammal populations were sampled in the right-of-way of the proposed Beaver Basin Rim Road at Pictured Rocks to determine if threatened, endangered, or special concern species were present and if they would be affected by the road. Efforts were concentrated on small mammals (rodents, bats, and shrews). Seven habitats (maple/beech, birch forest, mixed hardwoods/conifers, pine forest, pond/marsh edge, beaver basin, and old field/swamp) were identified. Trapping effort varied among habitats. Direct observations of animals, tracks, and scat were also used to identify species. Trap success was greatest in the birch forest. Of the 572 animals trapped none were endangered, threatened, or of special concern in the State of Michigan. Fourteen species of small mammals were captured, which included 9 species of rodents, 4 species of shrews, and 1 species of carnivore. Also included is a discussion of the potential for the presence of certain mammals not trapped in this study and/or their likelihood of having inhabited the area in the past. Placement of the road as it pertains to mammals is addressed. A copy of field notes is included.			
4	Smith, David C., Van Buskirk, Josh	1987	Herring gull predation on migrating bats; Jack-Pine Warbler	ISRO
	No Abstract			
5	St. Croix National Scenic Riverway	1987	Keen's bat species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the riverway, from observations made in 1987. The Keen's bat (*Myotis keenii*) is a rare species along the riverway, and is listed as special concern in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this mammal (biology, ecology, etc.).			

BEARS

1	author unknown	no date	The black bear (*Ursus americanus*)	INDU
	The report discusses the historic distribution and habitat preferences of the black bear, a species that has not occupied Indiana Dunes National Lakeshore since the late 1800s. Reasons for not restoring the black bear to its previous habitats in northwest Indiana are outlined.			
2	Bauer, Pat	1984	Calendar year 1983 - bear confiscations	VOYA
	Memorandum presenting data on the numbers of bears confiscated by county. Reasons for confiscation are given in totals (not by county). Accompanying chart presents similar data for 1975-1984. Includes counties surrounding Voyageurs National Park.			
3	Belant, Jerrold L.	2003	Pictured Rocks National Lakeshore status report; 17th eastern black bear workshop	PIRO
	The status report discusses the black bear monitoring and research activities that have been occurring at Pictured Rocks National Lakeshore.			

4	Benedict, James P.	1986	Bear-proofing campsites at Voyageurs National Park; Minnesota Volunteer	VOYA
	Article describes Voyageurs National Park's recent actions to "bear-proof" campsites by installation of food lockers and storage poles, and increasing public awareness. This is the published version of Jim Benedict's: "Black Bear Management in Voyageurs National Park" (NRBIB record # 356).			
5	Benedict, James P.	1986	Black bear management in Voyageurs National Park	VOYA
	Article describes Voyageurs National Park's recent actions to "bear-proof" campsites by installation of food lockers and storage poles, and increasing public awareness.			
6	Benedict, James P.	no date	Bear food survey, 1985	VOYA
	Actual data sheets from 1985 bear food survey conducted by Voyageurs National Park staff member. This survey presents data			
7	Brown, Robert T., Linn, R.M., Kowalski, William L., Larsen, William C., Schulz, Robert A.	1979	Baseline ecological studies and planning in the Apostle Islands National Lakeshore; Proceedings of the First Conference on Scientific Research in the National Parks II	APIS
	The project described here has two aims: 1. Accumulate a database of ecological information, including knowledge of soil factors. This database can then be used in park planning and development; 2. Provide information which can be used in the interpretive aspects of the park. In the summer of 1974 research at Bear Island in the Apostles group was initiated toward fulfilling these goals. This study included the following: 1. Identification, distribution and relative abundance of vascular plants. Mapping of the vegetation; 2. Identification, distribution and relative abundance of terrestrial vertebrate animals and correlation with vegetation; 3. Identification of soil types and construction of a soils map; and 4. Development of maps depicting soil use limitations with regard to trails, camping areas, and sewage disposal.			
8	Cole, Glen F.	1981	Black bear and white-tailed deer removals	VOYA
	Brief report to the superintendent presenting data on known removals of black bear and white-tailed deer from Voyageurs National Park. Includes data from hunting on private lands within the park, removals by park staff, and other kills.			
9	Debruyn, Terry D.	1992	Home range size, food habits and habitat use of female black bears in the central Upper Peninsula of Michigan	PIRO
	citation only			
10	Erickson, Albert W., Petrides, George A.; Erickson, Albert W., Nellor, John, Petrides, George A.	1964	Population structure, movements, and mortality of tagged black bears in Michigan; The black bear in Michigan	PIRO
	Black bears (*Ursus americanus*) were studied, for the most part, in a 400 mi2 area (11 townships) of Alger and northern Schoolcraft Counties, MI from 1952-57. Some of the study area is now part of Pictured Rocks National Lakeshore. Bears were captured with large box traps made of steel culvert pipe or with no. 4 1/2 jaw-spring steel traps that were placed near bear scat. One hundred fifty-nine bears were captured 182 times in the summer months, and 137 of them were tagged (marked) and released. They were classified by age as cubs (5-8 mo.), yearlings 17-20 mo.), or older animals, based on evidence from dentition, penile extrusion, and mammilary teat measurements. Trapped bears were also classified by behavior as wild, dump, or nuisance animals. Population estimates were derived from the ratio of marked to unmarked bears (Lincoln Index) killed by hunting. Practical limitations were recognized. Sex and age ratios, movements, and mortality of captured bears were reported. Age distribution was not evenly distributed between the 2 sampling methods. Movement distances differed between the sexes.			

11	Fleming, Kieran C.	1997	A demographic comparison of a hunted and an unhunted population of black bears in northern Wisconsin	APIS
	We studied black bear (*Ursus americanus*) population dynamics on a hunted and an unhunted population in northern Wisconsin. One hundred thirty three bears were captured, marked, and followed from 1984-1994. The unhunted population increased to a density of 0.76 bears/km2 in 1994, then began to decline. The hunted population density was 0.36 and 0.34 bears/km2 in 1990 and 1992 respectively. Bears in the unhunted population had significantly smaller home range size, older age of primiparity, and lighter weights than those in the hunted population. We documented 4 cases of skipped breeding cycles in the unhunted population after 1992 and none in the hunted population. Survivorship rates were lowest for yearlings (45%) in the unhunted population and attributed to natural mortality (n=8). Cannibalism is suspected in many of these cases. One yearling in the hunted population died from natural mortality and cannibalism was also suspected in this case. Survivorship in the hunted population was lowest for subadult males (29%) and was due to harvest; two subadult males died from natural factors, perhaps cannibalism or starvation, in the unhunted population.			
12	Garshelis, David L., Noyce, Karen V.	1983	Summary of bear food surveys, 1983	VOYA
	Forty-two wildlife managers and foresters rated the abundance of fourteen wild foods and 2 agricultural crops in various places within the bear range during 1983. Mean rating values for each type of food were calculated for each of the five Bear Permit Areas and for the bear range as a whole. These values were used to compare the abundance of bear foods among areas and between years. Report also provides some information on nuisance bear reports.			
13	Garshelis, David L., Noyce, Karen V.	1984	Bear problem reports, 1983 summary	VOYA
	Report presents and discusses data on bear complaints reported and investigated in 1983. Information on temporal and spatial distribution of complaints, types of complaints and damages, and disposition and sex-age composition of nuisance bears. A listing of the DNR bear problem reports is included which specifies dates, county, number of bears, type of complaint, and disposition for each incident reported.			
14	Garshelis, David L., Noyce, Karen V.	1984	Minnesota bear hunter surveys, 1980-84 - a five-year summary report	VOYA
	A survey of Minnesota bear hunters was initiated in 1980 in order to determine trends in hunting methods and to gain insights into impact of hunting on the bear population. Information is presented on: 1) types of hunting (weapons used) 2) hunting success 3) hunting effort 4) bears seen 5) behavior of bears and hunters and 6) registration compliance.			
15	Garshelis, David L., Noyce,	1984	Results from bear bait-station routes, 1984	VOYA
	Twenty-one bait station index routes were run in the Minnesota bear range in 1984 to test their validity as an index to bear density and distribution. Data on yearly changes in visitation rates, and geographical differences in visitation rates is presented and discussed along with general conclusions.			
16	Garshelis, David L., Noyce, Karen V.	1984	Nuisance bear complaints, 1984 summary	VOYA
	Report presents and discusses data on bear complaints reported and investigated in 1984. Information on temporal and spatial distribution of complaints, types of complaints and damages, and disposition and sex-age composition of nuisance bears. A listing of the DNR bear problem reports is included which specifies dates, county, number of bears, type of complaint, and disposition for each incident reported.			
17	Garshelis, David L., Noyce, Karen V.	1985	Summary of bear food surveys, 1984	VOYA
	Surveys of bear food abundance were conducted in 1984 in all five bear permit areas (includes areas adjacent to Voyageurs National Park), using a modification of the survey conducted in 1982 and 1983. In 1984, the abundance of each of the fourteen species was rated separately from its fruiting success and these two parameters were combined to obtain an index of fruit abundance. Geographic and yearly trends, bear food diversity, and relation of bear food abundance to nuisance activity is discussed, along with graphical representations of total bear food index, and food abundance.			

18	Garshelis, David L., Noyce, Karen V., Coy, Pamela L.	1989	Ecology and population dynamics of black bears in North-Central Minnesota	VOYA
	The Minnesota DNR initiated an intensive study of black bears in 1981 near the center of the Minnesota bear range. The study was designed to examine population dynamics (including density, natality and mortality), habitat relationships (especially food habits, food availability, and habitat use), and space-use patterns (movements and social organization). Many of the findings have been reported in previous annual work summaries. This report summarizes work conducted between March 1988 and March 1989, and updates some of the information presented previously. (Abstract by authors). Data from Voyageurs National Park areas is included.			
19	Garshelis, David L., Schaberl, James P.	1996	Black bear population dynamics and interactions with humans in Voyageurs National Park	VOYA
	This is a proposal for a two-year study of black bears in Voyageurs National Park which concentrates on the population dynamics and bear-human interactions. Specific objectives of the study are to: 1) Assess the population dynamics of black bears in Voyageurs including estimates of abundance and density, rates and sources of mortality, rates of reproduction, dispersal outside the park, projected population trend; and 2) Identify causes and propose solutions to the growing number of complaints of nuisance bears in campsites.			
20	Garshelis, David L., Visser, Larry G.	1997	Enumerating megapopulations of wild bears with an ingested biomarker; Journal of wildlife management	PIRO
	An orally administered biomarker, tetracycline hydrochloride, was used to monitor black bear (*Ursus americanus*) populations in northeastern Minnesota and the Upper Peninsula of Michigan. Preliminary experiments were conducted to determine appropriate dosage for markings on teeth and bones to appear and the percentage of bears (distinguished from fisher and raccoon) ingesting the bait. Nine 500 mg capsules of tetracycline were placed in each bait (0.5 kg of bacon). Trees were checked to determine the number taken by bears, and more than 3,400 measurements of claw mark spacing were taken. An average of 31% of baits were eaten by black bears and an average of 7% were ingested by other animals. A total of 4,784 premolar teeth from bears killed by hunters or in automobile accidents were analyzed for pigmented bands from ingested tetracycline from 1989-94. Each bear's age was also determined from teeth. Population estimates were determined using a modified Lincoln-Peterson Index. Results are reported on the basis of age and gender of the bears for each year of the study. Management implications are provided.			
21	Gurtin, Scott D.	1996	Bear incident report for 1996, Voyageurs National Park, Minnesota	VOYA
	In-house report details the number and type of bear-human incidents that occurred throughout Voyageurs National Park in 1996. Incidents also include property damage reports where there was no actual human/bear contact. A map depicting incident locations and a bar graph illustrating location trends by district are attached. For actual bear incident reports see Natural Resources Files: N2623 - Bear Incident Reports.			
22	Isley, Tom	1988	How we set the black bear hunting season; Minnesota Volunteer	VOYA
	Article describes the black bear research findings for the area and how they are utilized to determine hunting quotas and other restrictions.			
23	Johnson, Laurie A.	1996	Black bear myrmecophagy in the Central Upper Peninsula of Michigan	PIRO
	no abstract available			
24	Jones, Susan	1987	Black bear ecology, hunting history, conflicts with humans, and management in Wisconsin and the Apostle Islands National Lakeshore	APIS
	This document is a compilation of available information on black bear (*Ursus americanus*), in Wisconsin and the Apostle Islands National Lakeshore in particular. Part I contains information on the natural history of black bears. Part II covers the history of bear hunting and resultant population trends in Wisconsin; human/bear conflicts and black bear management strategies in general; and current research, population levels, history of human/bear conflicts, and management proposals for the Apostle Islands National Lakeshore in particular.			

25	Kenner, Brian C.	1991	Recent wildlife management problems	PIRO
	Porcupines (*Erethizon dorsatum*) and black bears (*Ursus americanus*) have displayed pest behavior in early summer 1991. Porcupines have gnawed at plywood components of the backcountry outhouse at Chapel Beach. Black bears have raided some campsites in the backcountry. Integrated Pest Management policies are reviewed and prescriptions given for preventing further problems, some requiring immediate action.			
26	Larsen, Karen A.	1995	Black bear incidents in Voyageurs National Park, 1995	VOYA
	Collection of data printouts and in-house reports on the numbers, locations, and other details of black bear/human incidents in 1995.			
27	Larsen, Karen A.	no date	Bear incidents summary reports, 1988 -1995	VOYA
	Data printouts of bear/human incident report summaries for each year from 1988 to 1995. Summaries include information on descriptions and behavior of the bears involved, location of the incidents, and any management actions taken.			
28	Larsen, Karen A.	no date	Potential bear attractants, Voyageurs National Park	VOYA
	Listing of locations in Voyageurs National Park where possible food sources or other attractants present potential for bear problems. Includes locations of dumpsters, trash cans, and campsite food lockers throughout the Park.			
29	Massopust, Jack L.	1984	Black bear homing tendencies, response to being chased by hunting dogs, reproductive biology, denning behavior, home range, diel movements, and habitat use in northern Wisconsin	APIS
	Homing tendencies of translocated nuisance black bears (*Ursus americanus*) were studied by radiotelemetry in 6 counties of northern Wisconsin during 1981-82. General nuisance complaints result from landowners seeing bears around their residences or barnyards. Nineteen nuisance bears were translocated 20 times during 1981-82. All bears were translocated an average distance of 65.9 km (range: 9.3-120.7); relocation distance for returning and nonreturning bears averaged 65.0 and 65.3 km, respectively. Seven of 11 females and 5 of 7 male bears returned to their original home range; 3 bears (1 male, 2 females) returned to the exact nuisance site. A yearling male was the only bear that established a home range in the vicinity of the release site. Persistent nuisance behavior, either on the way to their home range or upon return, was verified for 11 of 18 bears.			
30	Maxwell, Robert K., Thorkelson, Jeffrey, Rogers, Lynn L., Brander, Robert B.	1988	The field energetics of winter-dormant black bear (*Ursus americanus*) in Northeastern Minnesota; Canadian Journal of Zoology	VOYA
	Black bears (*Ursus americanus*) can spend half their lives in a severe winter climate using only internal sources of energy and exchanging energy only as heat with their external environment. This paper presents the energy requirement to maintain a bear, and the magnitude of the heat transfer pathways to the bear's surroundings. Flux rate densities of the heat budget were measured for two denning black bears. It was found that the surface area of an oblate spheriod simulating the shape of the curled-up bears balanced the budgets.			
31	Noyce, Karen V.	1992	Minnesota bear food survey: 10-year summary report, 1982-1991	VOYA
	The availability of high quality food is known to influence many aspects of the biology and behavior of black bears, including growth rates, reproduction and survival, seasonal movements, nuisance behavior and vulnerability to hunting. As part of an effort to monitor the size of Minnesota's bear population and to better understand harvest trends and nuisance bear activity, a survey of bear foods was initiated in 1982 to document distribution and year-to-year fluctuations in supplies of wild berries and nuts utilized by bears. This report contains 10 years of data including data from Voyageurs National Park.			
32	Noyce, Karen V.	1987	Minnesota bear food survey, 1982-1986, 5-year summary report	VOYA
	A statewide survey of bear food abundance was conducted from 1982 to 1986. Differences between areas and between years were due to variations in fruiting success rather than abundance of the species surveyed.			

33	Noyce, Karen V.	1994	Summary of bear food surveys, 1993	VOYA
	Surveys of bear food abundance were conducted in 1993 in all five bear permit areas (includes areas adjacent to Voyageurs National Park). The abundance of each of the fourteen plant species was rated separately from its fruiting success and these two parameters were combined to obtain an index of fruit abundance. Geographic and yearly trends, bear food diversity, and relation of bear food abundance to nuisance activity is discussed, along with graphical representations of total bear food index, and food abundance.			
34	Ontario Ministry Of Natural Resources	1989	Black bear harvest	VOYA
	Unpublished report detailing approximate numbers of black bears harvested in areas of Ontario directly adjacent to Voyageurs National Park. Report presents # bears taken, # hunters, and resulting % success.			
35	Pease-Davis, Jennifer	1994	Visitor survey on the effectiveness of human/bear management techniques in Voyageurs National Park	VOYA
	During the summer of 1989, ninety-six surveys were administered at both designated and undesignated camping sites within Voyageurs National Park to evaluate the effectiveness of the park's human/bear management plan. The survey posed questions related to food storage methods, opinions regarding park-provided food lockers, encounters with bears, and distribution of information. Information obtained is presented and management recommendations are made.			
36	Pease-Davis, Jennifer	no date	Visitor survey on the effectiveness of human/bear management techniques in Voyageurs National Park - research prospectus	VOYA
	Early bear management in the National Parks consisted mainly of shooting or relocating nuisance bears. New human/bear management plans incorporate new practices such as removal of artificial food sources, public education, enforcement of park regulations, and bear research and monitoring programs. This study attempts to assess the effectiveness of the human/bear management techniques being used at Voyageurs National Park through visitor surveys.			
37	Pictured Rocks National Lakeshore	no date	Bear management file	PIRO
	File folder contains sightings of black bear (*Ursus americanus*), bear activity reports, nuisance bear complaints, bear mortality and handling forms, and case incident reports of black bear in campgrounds in Pictured Rocks National Lakeshore, MI. Interoffice letters document management suggestions in dealing with the behavior of black bear attracted by improperly secured food in the backcountry and frontcountry settings. Documents pertaining to this project from researchers and governmental units are also included.			
38	Pictured Rocks National Lakeshore	1993	Bear tetracycline data sheet	PIRO
	Population census of black bear (*Ursus americanus*) in Pictured Rocks National Lakeshore, MI was carried out in 1992, 1993, and 1995 as part of a larger census project by the Michigan Department of Natural Resources. Nine bait stations, evenly spaced throughout the Lakeshore, were established. The bait contained tetracycline which, when ingested, becomes a biomarker on teeth. Data forms include information on date when bait was set; date checked; township, range, and section location; description of overstory, understory, and ground cover; presence of claw marks; and whether or not the bait was visited by bear. Detailed, written directions to each baiting site are provided. Maps of the Lakeshore illustrate the locations where bait was set out. Records of kills by bear hunters will provide the census data over the years.			
39	Rogers, Lynn L.	no date	Bear diet and habitat in the Great Lakes region, 1988 progress report	VOYA
	Three hundred thirty-five black bear scats were collected across the Great Lakes Region and thirty-six food surveys forms providing information on the distribution of major berry species and their productivity in 1988 were analyzed. Results from Voyageurs National Park are included in this report.			
40	Rogers, Lynn L.	no date	Effects of food supply and kinship on social behavior, movements, and population growth of black bears in Northeastern Minnesota; Wildlife Monographs	VOYA
	Black bears (*Ursus americanus*) were studied in northeastern Minnesota from 1969 through 1985 to determine (1) the annual cycle of foraging and social behavior, (2) changes in mother-offspring relationships from birth through maturity, (3) the influence of food availability on social behavior, movements, and population growth, and (4) important habitat components.			

41	Rogers, Lynn L.	1970	Black bear of Minnesota; Naturalist	VOYA
	In 1969, 53 bears were live-captured in Lake County just south of the Boundary Waters Canoe Area in order to study the sex ratio and age structure of the population, general health of the animals, growth rates, and seasonal weight changes and movements. Select bears were fitted with radio-collars to obtain data on habitat use and movement patterns.			
42	Rogers, Lynn L.	1978	Social relationships, movements, and population dynamics of black bears in Northeastern Minnesota; Dissertation Abstracts International	VOYA
	"Social relationships, movements, and population dynamics of black bears were studied in northeastern Minnesota during 1969-1977. One hundred and six bears were fitted with radio-collars and some of them were radio-tracked nearly throughout the 9 years of study. Observed behavior of bears accorded with predictions of kinship theory in that behavior differentially enabled close kin to compete for food and space despite solitary living habits." (from author's abstract)			
43	Rogers, Lynn L.	1986	Long-term survival of adopted black bear cubs in suboptimal habitat; Wildlife Society Bulletin	VOYA
	Previous studies have shown that in Pennsylvania, where natural foods and foods provided by humans are abundant and black bears show the highest growth and reproductive rates reported for the species, litters with adopted cubs have shown high survival rates in their first year. This study examined the long-term survival of adopted cubs and the effects of adoptions on foster families in the Superior National Forest where food is less abundant and black bear growth and reproduction rates are much lower.			
44	Rogers, Lynn L.	1989	Progress report: 1988 Great Lakes bear habitat study	VOYA
	In 1988, 335 black bear scat samples were collected from across the Great Lakes region and analyzed for content. Results are presented by area, including data from samples collected in Voyageurs National Park.			
45	Rogers, Lynn L.	1989	Progress report: 1989 Great Lakes bear habitat study	VOYA
	In 1989, 795 black bear scat samples were collected across the Great Lakes Region and analyzed for content. This report presents the data by area, including an analysis specific to scat collected in Voyageurs National Park.			
46	Rogers, L.L., Allen, A.W.	1987	Habitat suitability index models: black bear upper Great Lakes region	PIRO
	citation only from thesis by Johnson, Laurie A. (1996)			
47	Rogers, Lynn L., Mech, L. David	1981	Interactions of wolves and black bears in Northeastern Minnesota; Journal of Mammalogy	VOYA
	Wolves and Black bear co-inhabit large parts of Canada, Alaska, and Minnesota. This paper reports on documented observations of interactions between black bears and wolves.			
48	Schaberl, James P.	1996	Bear food survey, Voyageurs National Park, 1996	VOYA
	Copy of the Voyageurs National Park data sheet completed for the Minnesota Department of Natural Resources Annual Bear Food survey. Rates species-specific food availability for the 1996 summer/fall season.			
49	Schad, Dave	1983	1983 Minnesota black bear harvest	VOYA
	Report summarizing black bear harvest totals for Minnesota in 1983. Provides information by county. Includes areas surrounding and directly adjacent to Voyageurs National Park.			
50	Schneeweis, James C.	no date	Bear food survey, 1984	VOYA
	Actual survey data sheet for the International Falls area. Provides information on the plant abundance rating, and fruit production rating for 14 species of plants preferred by black bears as food sources.			

51	Trauba, David R.	1996	Black bear population dynamics, home range, and habitat use on an island in Lake Superior	APIS
	Social mechanisms regulating black bear (*Ursus americanus*) populations in a density-dependent manner are poorly known. Most bear studies are of hunted populations, making it difficult to determine the influence maximum density may have on reproduction and mortality. During 1984-92, I radio-collared 27 black bear on an island in Lake Superior to determine the population dynamics of an unhunted black bear population. Age of primiparity for 3 females was 5 years. Mean litter size for 8 litters was 2.6 cubs (14 M: 7 F). Annual survival rates for cubs, yearlings, subadults, and adults were 0.69, 0.33, 1.00, and 0.97, respectively. Black bears first colonized Stockton Island in the 1970's. The population steadily increased to a high of 24 bears (59 bears/100 km2). In 1992, the population declined as the result of cannibalism. Yearling weights declined, and the age of primiparity increased as the density increased. This study suggests that social interactions and intraspecific killings may be regulating the black bear population in a density-dependent fashion. Also included in the thesis is a paper on home range and habitat use by black bears on Stockton Island.			
52	author unknown	no date	Total bear incidents reported at Voyageurs National Park from 1976 to 1989	VOYA
	Single sheet with computer generated graph depicting number of bear incidents reported, by year, from 1976 to 1988.			
53	Van Stappen, Julie F.	1997	Bear management plan, Apostle Islands National Lakeshore	APIS
	The goals and objectives of the Bear Management Plan are to: maintain the natural integrity, distribution, abundance and behavior of the endemic black bear population; provide for visitor safety by minimizing bear/human conflicts by reducing human-generated food sources and by regulating visitor use activities; and to provide opportunities for visitors to understand and appreciate the black bear in its natural habitat.			
54	Voyageurs National Park	no date	Bear incident locations, Voyageurs National Park, 1978 through 1984	VOYA
	Collection of general orientation maps depicting the whole Voyageurs National Park with campsite locations marked and locations of bear incidents penciled in. Each map depicts one year’s incidents.			
55	Voyageurs National Park	1977	Bear incidents, 1977 - current	VOYA
	Collection of files containing bear incident reports from each year beginning in 1977 and continuing to the present year. Each incident report form describes the bears involved, the location and situation of the incident, damages done, and information on the reporting party. For summary reports on these incidents see NRBIB record # 414.			
56	Voyageurs National Park	1986	Human/bear management plan	VOYA
	Black bears inhabit much of the land area within Voyageurs National Park with an estimated population density of one bear per square mile. Vegetation, especially grasses and sedges, make up most of the bear's diet, but they are also very opportunistic feeders. Easy availability of garbage, inadequate storage of food, and deliberate feeding of bears in the park and surrounding areas have led to alternation the bears' natural feeding habits, changes in natural behavior, and ultimately conflicts between bears and people. Although no human injuries or deaths have occurred as a result of theses conflicts, thousands of dollars of property damage, and the relocation or killing of nuisance bears has resulted. The primary goals of the human/black bear management plan are to prevent the causes of human/bear conflicts and reduce the number of annual bear control actions to almost zero.			
57	Voyageurs National Park	1994	Bear food surveys, 1994	VOYA
	Completed data form and instructions for the annual bear food survey done in 1994. This data sheet is for the Voyageurs transects only and may not have ever been submitted to the DNR for inclusion in their annual report to Voyageurs.			
BEAVER				
1	Adams, Charles C.	1909	Notes on Isle Royale mammals and their ecological relations; An ecological investigation of Isle Royale, Lake Superior	ISRO
	An annotated list of mammals occurring on Isle Royale in 1904; the list includes for each species ecological notes and geographical range. This article comments on the absence of otter (*Lutra hudsonica hudsonica*) and the apparent extinction of beaver (*Castor canadensis*) at this time. The list includes historical sightings of woodland caribou (*Rangifer caribou*), Canada lynx (*Lynx canadensis*), and marten (*Mustela americana*). It also contains a list of old fur trading posts found on Isle Royale.			

2	Aldous, Shaler E.	1938	Beaver food utilization studies; Journal of Wildlife Management	ISRO
	no abstract available			
3	Allen, Durward L.	1957	A proposal for studies of the timber wolf and other wildlife in Isle Royale National Park	ISRO
	This is a copy of the first proposal to initiate a long-term ecological study of the mammalian species of Isle Royale, primarily the wolf, moose, beaver and snowshoe hare.			
4	author unknown	no date	Beaver survey	ISRO
	This map shows locations of dead (visited), active (visited), and status unknown (plane spotted) beaver colonies from a survey of unknown date. The name of the person conducting this survey and the date of the survey are not found on this map.			
5	Basey, John M., Jenkins, Stephen H.	1995	Influences of predation risk and energy maximization on food selection by beavers (*Castor canadensis*); Can J Zool	VOYA
	Deterministic models were developed to generate predictions for three hypotheses: beavers (*Castor canadensis*) select food on the basis of (1) maximization of energy return, (2) minimization of predation risk, or (3) minimization of the ratio of predation risk to energy return. To test predictions, beaver were provided with a choice of two sets of quaking aspen, 1.5 or 3.0 cm in diameter, with the 3.0 cm stems placed at distances from the pond equal to or greater than those of the 1.5 cm stems. Selection of aspen was consistent with hypothesis 3. Beavers primarily stripped bark of aspen for consumption in water, and the stripping rate increased as the water temperature decreased. Size-distance relationships in selection of aspen and the stripping location in relation to water temperature were consistent with the hypothesis that beavers were trading off maximization of profitability against minimization of predation risk. (abstract by author)			
6	Belovsky, Gary E.	1984	Summer diet optimization by beaver; American Midland	ISRO
	Foraging data collected for beaver (*Castor canadensis*) at Isle Royale National Park, during the summer of 1973 provided basic natural history information pertaining to diet, food preferences, rates of consumption and activity cycle. Beaver foraging was consistent with a linear programming model of herbivore optimal foraging. The model was used to predict beaver diet, the maximum distance a beaver foraged from its pond and the manner in which the minimum and maximum diameters of beaver-cut woody vegetation changed with distance from the pond.			
7	Berg, William	1996	Aerial beaver lodge survey, 1996	SACN
	This fact sheet is a summation of an annual aerial beaver lodge survey. Eleven routes, including the St. Croix, are checked. Data results are expressed by live colonies per survey mile, and are presented in raw form and by graph. Also included is a map of survey routes.			
8	Bradt, G.W.	1947	Michigan beaver management	ISRO
	no abstract available			
9	Buech, Richard R., Rugg, David J., Miller, Nancy L.	1989	Temperature in beaver lodges and bank dens in a near-boreal environment; Canadian Journal of Zoology	VOYA
	"The thermal environment of selected lodges and bank dens of beavers (*Castor canadensis*) was studied in northeastern Minnesota to evaluate determinants of chamber air temperature. Mean air temperature was higher while the range in mean air temperature was smaller inside the chamber than outside in all months. Seasonal temperature extremes in lodges were generally within the thermoneutral zone of beavers year round. Thus, shelters allow beavers to exploit environments that would otherwise be physiologically unsuitable to them. Data were consistent with our hypothesis that temperature of the soil or water substrate has a dominant influence on chamber air temperature. Two bank dens were cooler than an open-water lodge; hence onshore shelters may offer better protection against heat stress during hot weather. In winter, it appears that (i) total insulation (lodge walls plus snow) is sufficient to counter the influence of outside air temperature, (ii) temperature of the substrate underlying a lodge largely determines chamber air temperature, and (iii) heat produced by beavers raises the temperature of lodges above that derived from the lodge substrate." (abstract by author)			
10	Daues, Tom V., Payne, Neil F.	1990	The status of beaver and muskrat in Pictured Rocks National Lakeshore	PIRO
	Three aerial surveys over Pictured Rocks National Lakeshore, MI were conducted to estimate the populations of beaver (*Castor canadensis*) and muskrat (*Ondatra zibethica*). Browse piles and lodges were counted. Vegetation along waterways in the Park is not the preferred food of either species. The beaver population is estimated to be 160, assuming 5.5 beaver per lodge. Muskrat appear to be rare; only 1 muskrat house was observed. Monitoring prescriptions are included.			

11	Dustin, Fred	1931	An archeological reconnaissance of Isle Royale, Michigan survey of Isle Royale, Michigan, by direction of the fifty-fifth legislature of Michigan Anthropological reports	ISRO
	Presents locations, descriptions and findings of excavations of ancient copper mining pits, villages, and campsites on Isle Royale. Some of the findings include bones of moose and beaver.			
12	Ferrin, Randy	1997	Beaver	SACN
	Contained here are documents related to the beaver management plan being developed for the St. Croix Riverway. The plan will be a cooperative effort between the state Departments of Natural Resource, Great Lakes Indian Fish and Wildlife Commission, and the Park Service. This file has the background information, meeting notes, a working outline, state and Native operational guidelines, work proposals, and data tables and digitally produced maps of beaver activity on the Riverway. Also included are state management plans and a draft of the riverway plan.			
13	Fuller, Todd K., Markl, Judy A.	1987	Beaver, *Castor canadensis* , colony density in the Bearville study area, Northcentral Minnesota; Canadian Field-Naturalist	VOYA
	Densities of active beaver (*Castor canadensis*) colonies, determined from aerial searches of the same 362.6 km2 quadrats each year in the 839 km2 Bearville Study Area in north-central Minnesota during 1981-1985, increased from 0.58/km2 to 0.86/km2 (X = 0.72/km2).			
14	Gensch, Robert H.	1946	Progress report, observations on the beaver of Isle Royale National Park, Michigan from May 8 to June 4, 1946	ISRO
	no abstract available			
15	Gilbert, Karl T.	1945	Beaver colony map	ISRO
	A 19 inch by 24 inch map of Isle Royale showing locations of beaver colonies as surveyed in October of 1945. Shows active colonies, dead colonies and those of unknown status.			
16	Gilbert, Karl T.	1946	Memorandum for the superintendent, Isle Royale National Park	ISRO
	no abstract available			
17	Gilbert, Karl T.	1946	General statement giving coverage to the beaver on Isle Royale	ISRO
	no abstract available			
18	Hammerson, Geoffrey A.	1994	Beaver (*Castor canadensis*): ecosystem alterations, management, and monitoring; Natural Areas Journal	VOYA
	This Element Stewardship Abstract (ESA) for beaver (*Castor canadensis*) discusses ecosystem alterations induced by beaver, beaver impacts, biological monitoring, and management needs and procedures.			
19	Hebig, Ann M.	1995	Beaver monitoring, 1995	SACN
	This is the first annual report that hopes to provide baseline data concerning beaver population dynamics on the Namekagon. A summary of the data, gathering methods, and concerns are provided. Also included are tables of surveyed sections by miles, number of lodges and dams, activity and beaver sightings.			
20	Hebig, Ann M.	1996	Beaver monitoring, 1996	SACN
	This annual report, begun in 1995, hopes to provide baseline data concerning beaver population dynamics on the Namekagon. A summary of the data, gathering methods, and concerns are provided. Also included are tables of surveyed sections by miles, number of lodges and dams, activity and beaver sightings. A map of the Namekagon river shows the beaver lodges surveyed.			
21	Jennings, Sue	1997	Interagency beaver management notes	SACN
	Contained here are handwritten notes from an interagency meeting concerning the growing conflicts between beavers and humans along the riverway. Areas of greatest conflict would get the most intense management consideration under the proposed plan. Included are the Park Service goals and policies concerning problem animals, a meeting agenda and list of participants.			
22	Johnston, Carol A., Pastor, J., Naiman, R. J.	no date	Effects of beaver and moose on boreal forest landscapes; IN: S H Cousins, R Haines-Young and D Green, editors Landscape Ecology and Geographic Information Systems Taylor and Francis, London, In press	ISRO
	no abstract available			

23	Johnston, Carol A., Naiman, Robert J.	1987	Boundary dynamics at the aquatic-terrestrial interface: the influence of beaver and geomorphology; Landscape Ecology	VOYA
	"Beaver (*Castor canadensis*) impoundments are used to illustrate the effect of large animals on the boundary dynamics of 'patch bodies', volumetric landscape units which have surficial boundaries with upper and lower strata, and lateral boundaries with adjacent patches within the same stratum." (excerpt from author's abstract)			
24	Johnston, Carol A., Naiman, Robert J.	1989	Predicting beaver colony density in boreal landscapes; Journal of Wildlife Management	VOYA
	We propose a method to quantitatively relate the proportion of beaver (*Castor canadensis*) created impoundments to beaver numbers and population trends. Stepwise multiple regression retained 4 of 11 beaver impoundments as positively or negatively related to colony density: shallow marsh (+), seasonally flooded meadow (-), pond (+), and wet deciduous shrub (-). The independent variables of shallow marsh and seasonally flooded meadow provided the best estimate of beaver colony densities. This model can be used in wildlife management and research as a technique to census historical beaver populations and to assess the effect of beaver on aquatic and terrestrial ecosystems. (abstract by author)			
25	Johnston, Carol A., Naiman, Robert J.	1990	Aquatic patch creation in relation to beaver population trends; Ecology	VOYA
	The creation of aquatic patches by beaver between 1940 and 1986 in northern Minnesota, was studied in relation to changes in beaver population. The rate of patch formation was much higher during the first two decades of colonization than during the subsequent two decades. The average area of all pond sites, which included both filled and drained ponds, remained at about 4 ha throughout the time period, but the average area of new ponds decreased significantly over time. Ponds established by 1961 constituted 75% of the total number and 90% of the total pond site area as of 1986. When pond sites of similar age but different decade of establishment were compared, the average area per pond site was always significantly larger for the earlier cohort. Although the rate of pond creation paralleled the increase in number of beaver colonies 1961-1986, the rate of new pond creation prior to 1961 greatly exceeded the increase in number of beaver colonies. We conclude that the rate of patch formation after the first two decades of beaver colonization was constrained by geomorphology, which limited the availability of sites at which a beaver dam could impound a large area of water.			
26	Johnston, Carol A., Naiman, Robert J.	1990	The use of a geographic information system to analyze long-term landscape alteration by beaver; Landscape Ecology	VOYA
	A Geographic Information System (GIS) was used to analyze how beaver (*Castor canadensis*) have altered the hydrology and vegetation of Voyageurs National Park, Minnesota over a 46-year period. Maps of beaver ponds prepared from 1940, 1948, 1961, 1972, 1981, and 1986 aerial photographs were analyzed with a raster-based GIS to determine impoundment hydrology and vegetation distributions for each map date. Overlay and classification techniques were used to quantify hydrologic and vegetation changes between map dates. Total area impounded increased from 1% to 13% of the landscape between 1940 and 1986, as the beaver population increased from near extirpation to a density of 1 colony/km2. Most of the impoundment area increase occurred during the first two decades, when 77% of cumulative impoundment area was flooded. Once impounded, greater than or equal to 60% of the area maintained the same water depth or vegetation during any decade. GIS procedures were combined with field data to show that available nitrogen stocks nearly tripled between 1940 and 1986 as a result of beaver impoundment. (excerpt from abstract)			
27	Johnston, Carol A., Naiman, Robert J.	1990	Browse selection by beaver: effects on riparian forest composition; Can J For Res	VOYA
	Beaver (*Castor canadensis*) herbivory was studied on two ponds in the headwaters of Amity Creek near Duluth, Minnesota and was found to have both immediate and long-term effects on biomass, structure and composition of riparian forests. Selective foraging by beaver decreased the relative importance of preferred species (i.e., *Populus tremuloides*) and increased importance of avoided species (i.e., *Alnus rugosa* [Du Roi] Spreng., *Picea glauca* [Moench] Voss), with long-term implications to forest succession and dynamics.			
28	Krefting, Laurits W.	1963	Beaver of Isle Royale; Naturalist	ISRO
	Describes early observations of beaver at Isle Royale beginning around 1847 when old beaver dams were found along stream or river locations on the island. A study of food habits show that beaver utilize both aspen and paper birch, in addition mountain ash and other species, but prefer aspen over paper birch. Describes the beaver population decline in the 1940's probably due to lack of food, though predation by coyote likely had a secondary role. Since 1958, the population appears to have increased.			
29	Krefting, Laurits W., Lee, Forrest B.	1948	Progress report, beaver food investigation of Isle Royale National Park, May 2-26, 1948	ISRO
	no abstract available			

30	Pastor, John, Bonde, John, Johnston, Carol A., Naiman, Robert J.; Gardner, R.H.(Ed.)	no date	Markovian analysis of the spatially dependent dynamics of beaver ponds; some mathematical questions in biology: predicting spatial effects in ecological systems	VOYA
	The mathematical properties of Markov chains are reviewed and applied to an analysis of beaver pond dynamics in the boreal landscape during a period of population growth. Markov chains were constructed with the use of geographical information systems from a historic sequence of air photos. The eigenvalues and eigenvectors of these matrices demonstrate that the landscape is governed by three rules: 1) eventually all valley bottoms will be converted permanently to beaver ponds, 2) seasonally flooded wetlands associated with these ponds are a minor component of the landscape, and 3) the dynamics of the landscape are governed by an inverse relation between dominance by flooded ponds and moist meadows as beaver ponds are occupied and abandoned. A model is suggested in which riparian forest succession is coupled to wetland succession in beavers ponds by using Markov chains linked through their state vectors. (abstract by author)			
31	Pastor, John, Downing, Amy, Erickson, Heather E.	1996	Species-area curves and diversity-productivity relationships in beaver meadows of Voyageurs National Park, Minnesota, USA; Oikos	VOYA
	Species richness (S) increased with area (A) as shown in the well-known power function proposed by Arrhenius: S = cAz . We show that the exponent of the species area curves, z, was negatively correlated with aboveground annual biomass but the coefficient of the curves, c, was positively correlated with production in two communities dominated by grasses and sedges in beaver meadows in n. Minn. The parameters of the species-area power function were not correlated with water table depth nor with soil nutrient availabilities. We then show that the often-reported unimodal relationship between richness and productivity can be derived from the negative correlation of z and the positive correlation of c with productivity. We also show that the productivity corresponding to maximum richness declines with increasing area sampled. The relationships between richness and productivity depend on the area censused and the correlations of the coefficient and exponent of the species-area curve with productivity. Interpretations of diversity-productivity relationships are sensitive to plot size and require specification of the species-area relationship for the community in question.			
32	Peterson, Rolf O.	1984	1984 Winter study data	ISRO
	Includes raw data gathered during annual observation of the wolf and moose populations on Isle Royale National Park, during the winter study period. Information included: 1984 Dead Moose map, Moose census, flying conditions, kills/carcasses, wolf observations, travels and kills, moose aerial observations, twin moose observations, fox information, otter and beaver information, flight maps showing locations of wolves and autopsy records.			
33	Seitz, William K.	1964	Ecological study of the beaver in Isle Royale National Park	ISRO
	The emphasis of this study was on trapping beaver and on observations of their life history, food habits, and relationships with muskrats. Observations described are copulation and mating behavior, calling, daily activity and shelter, food habits, population, and movement. Other animals observed in this study were mink, fox, and bald eagle.			
34	Shelton, Philip C.	1961	The beaver of Isle Royale National Park, Michigan - first annual report, 1960	ISRO
	This is the first summary report of a three-year study of the beaver and associated vertebrates of Isle Royale National Park. Emphasis is places on relationships of the beaver to the two most influential mammals on the island, timber wolves and moose. Presents a history of the beaver on Isle Royale. Present status of the beaver by aerial survey shows the presence of 29 active sites. At eleven other sites, a single beaver was seen or reported or fresh signs were found. There is some quantitative support to the contention that beaver numbers have declined drastically in the last 10 years. There is no indication of the role wolves have played in this decline. Young beaver were reported from only two sites. If it is true that young are seldom produced, this could indicate that a shortage of winter food is the major limiting factor. Food requirements of beaver and food availability are poorly understood.			
35	Shelton, Philip C.	1975	Beaver studies, 1973 and 1974; IN: Peterson, Rolf O and Durward L Allen April 30, 1975 ecological studies of the wolf on Isle Royale, annual report (Covering the seventeenth year in the Isle Royale Studies) 1974-1975 Purdue University, Lafayette, Indiana 20 p	ISRO
	(This actually is an unpublished report.) Information regarding Isle Royale's beaver (*Castor canadensis*) population was up-dated through aerial surveys live-trapping, and studies of food utilization and availability. An estimate for the number of active beaver colonies was 300 by aerial survey in 1973. The 1974 aerial survey yielded 315 sites. The increase in beaver population is found mostly in stream habitats.			

36	Shelton, Philip C.	1979	Beaver studies, fall 1978; IN: Peterson, Rolf O, Joseph M Scheidler, and Philip C Shelton 1979 ecological studies of wolves on Isle Royale, annual report - 1978-1979 (Covering the twenty-first year of research) Michigan Technological University, Houghton, MI 20 p	ISRO
	An aerial survey to assess the beaver population at Isle Royale was conducted in October of 1978. 156 sites were identified and were classified by habitat and presence of activity. Beavers were live trapped and examined. An increase in the presence of the parasitic beetle, *Leptinillus validus Horn* , was noted.			
37	Shelton, Philip C.	1979	Population studies of beavers in Isle Royale National Park, Michigan; IN: Linn, R M (ed) proceedings of the first conference on scientific research in the National Parks, New Orleans, LA, Nov 9-12, 1976 transactions and proceedings series, National Park Service, No 5, Washington 1:353-357	ISRO
	Summarizes the history of the Isle Royale beaver populations through 1974, based on historical records and recent investigations. The history of beavers on ISRO is one of probable extermination by trapping, followed first by habitat changes highly favorable to beavers, and later by abundantly successful natural reestablishment. The future of beavers in this dynamic community will depend upon their continued ability to forage from water in the face of increased wolf predation, and on their ability to depend increasingly on less preferred food species.			
38	Shelton, Philip C.	1980	Beaver studies, fall, 1980	ISRO
	This report is also found in: Peterson, Rolf O., Philip W. Stephens, and Philips C. Shelton, 1981. Ecological Studies of Wolves on Isle Royale, Annual Report - 1980-1981 (Covering the twenty-third year of research). Michigan Technological University, Houghton, MI. 24 p. Discusses results of the 1980 aerial survey and ground work to assess the population of Isle Royale beaver. The population continued to decline from previous counts. 122 sites were identified and classified by habitat. Sites were observed for signs of recent activity. Beavers were live trapped and examined.			
39	Shelton, Philip C.	1987	Beaver studies, Isle Royale National Park, 1986	ISRO
	Total colonies with food piles were 204 and they were sized in an attempt to quantify food pile size for comparison with surveys done in Voyageurs National Park and for comparison in future studies at Isle Royale. The total number of beaver present on Isle Royalein the fall of 1986 was calculated to be approximately 1400 animals. Beaver numbers are thought to be influenced primarily by wolf predation. Report lists tree and shrub species cut by beaver for use as food. Report speaks of the complexity of the effect of beaver activity on plant succession. Contains maps showing locations of active beaver colonies. The library's bound copy of this report includes a series of color prints and duplicate slides. These prints and slides illustrate changes in vegetation, including those influenced by beaver, on the northeast portion of Isle Royale from the 1960s and 1970s through the mid 1980s.			
40	Shelton, Philip C.	1984	Results of aerial beaver survey, Voyageurs National Park, 1984 October 27-31	VOYA
	In 1984 an aerial beaver survey was done for Voyageurs National Park. Food cache size, total food caches, and habitat were tallied and summarized. Structure type and count were recorded and tallied by wetland community type. Included is a 1:50000 scale metric topographic map of Voyageurs National Park. Field notes, sites, and legend have been written directly on the map.			
41	Shelton, Philip C.	1985	Beaver studies, Isle Royale National Park, 1984	ISRO
	Report has a table summarizing beaver surveys from 1962 to 1984. Fluctuations in beaver numbers during this period are thought to be influenced primarily by wolf predation. The beaver population in 1984 rose to 204 animals. The correlation between beaver and wolf numbers is remarkable, although the role of beavers in influencing wolf numbers is less clear. Distribution of beavers by habitat indicates that most of the change in population was in stream-dwelling beavers; harbor beavers continue to decline. Trapping was not extensive enough to indicate whether there were any changes in number of beavers per colony.			
42	Shelton, Philip C.	1989	Beaver on Isle Royale	ISRO
	Presents the history of the beaver on Isle Royale. On Isle Royale, beavers have exerted a tremendous influence on the landscape by their damming of virtually every available stream and swamp, and by systematically removing aspen and birch trees from slopes near water all over the island. The author also presents information on the biology and behavior of the beaver.			
43	Shelton, Philip C.	1989	Beaver studies, Isle Royale National Park 1988-1989	ISRO
	This report contains results of studies conducted during fall off 1988 and late spring 1989. Included in these studies are live trapping during which beaver were handled and released, and an aerial survey of the entire island flown in October 1988 to locate active beaver colonies. Additional groundwork both in fall and in spring included extensive notes on woody food utilization and availability.			

44	Shelton, Philip C.	no date	Results of aerial beaver survey, Voyageurs National Park, 2000 October 23-28	VOYA
	In 2000 an aerial beaver survey was done for Voyageurs National Park. Food cache size, total food caches, and habitat were tallied and summarized. Structure type and count were recorded and tallied by wetland community type. Included is a 1:50000 scale metric topographic map of Voyageurs National Park. Field notes, sites, and legend have been written directly on the map.			
45	Smith, Douglas W.	1988	Natural winter body temperature fluctuations in the beaver (*Castor canadensis*)	VOYA
	Five adult beavers were radio implanted in northern Minnesota and Upper Michigan to determine if core body temperature (Tb) fluctuated through winter. Beavers were captured in live-traps, then sedated and surgically implanted with temperature/activity sensitive transmitters. An automated, continuously operating radio system monitored beavers either simultaneously or individually from late autumn through early spring. Beaver Tb was found to fluctuate daily and seasonally. Daily Tb fluctuations were greatest during winter (2.6 C), and as much as 5.7 C over several days. Tb fluctuations were only moderate in late autumn (1.5 C). Seasonally mean body Tb declined through winter reaching the lowest Tb in early February (32.5 C). During fall Tb was highest at night, and beavers from the same lodge showed synchronous Tb fluctuations. In winter Tb fluctuations of these same beavers was asynchronous, and did not have a consistent day-night pattern. Lowered wintertime Tb is interpreted as being a physiological adaptation to a seasonally restricted food supply. (abstract by author)			
46	Smith, Douglas W.	1991	Extinction probability and recolonization potential of beavers on Stockton Island, Wisconsin	APIS
	Beaver (*Castor canadensis*) are present in Apostle Islands National Lakeshore, Wisconsin because of logging activity in the 1920s - 30s. According to National Park Service policy, beavers are then classified as an exotic. The park would like to reestablish white pine-hemlock on Stockton Island, its pre-logging forest type. The purpose of this study was to examine the present status of beaver on Stockton Island and to predict future population trends to aid park planners with management (i.e., possible beaver removal). Beavers have been declining on Stockton at a rapid rate since 1979; poor habitat is partly responsible, but predation on beaver by bears is probably hastening the population decline. If current trends continue (high predation, low recolonization), beavers have a slight change (12%) of becoming extinct on the island. If colonization from other islands or the mainland takes place, beavers will persist on Stockton at least until the year 2000 and perhaps beyond. Declining habitat may reduce the viability of the population, but I was not able to quantify this variable in the model. In short, if beaver extinction is desired, trapping and dam removal will be necessary.			
47	Smith, Douglas W.	1991	Earthwatch fall field report 1991 - dispersal strategies and cooperative breeding in beavers of Voyageurs National Park	VOYA
	Twenty-three Earthwatch volunteers participated in studies of beaver (*Castor canadensis*) in Voyageurs National Park during the fall of 1991. The primary objectives of the study were to continue ongoing studies in beaver population dynamics, and to better understand why and when beaver disperse. Volunteers live-trapped 153 beavers, radio-instrumented 17 dispersal-aged beavers, and quantified habitat conditions at 43 active and inactive beaver ponds. These data will be used as a test of the hypothesis that beavers disperse on the basis of habitat quality. Results will not be available until the spring when beaver dispersal normally occurs. Preliminary data seem to indicate a correlation between beaver family size and reproduction and the conditions of the pond where they live. Family size tended to be smaller and reproduction less at ponds that were lacking aspen, or where beavers had to travel further on land to access aspen. Aquatics also seem to be important, but quantitative results are not available at this time.			
48	Smith, Douglas W.	1992	Isle Royale beaver study -- October 1992	ISRO
	The number of active beaver (*Castor canadensis*) colonies in Isle Royale National Park was determined by aerial survey. This is the tenth population count in a series of surveys begun by Philip Shelton in 1962. Total number of beaver colonies with food cashes and other sites with beaver sign were observed and counted. The population continues to decline since the late 1980s probably due to continued wolf predation combined with habitat exhaustion. For the first time since surveys began, no beaver colonies were recorded on Lake Superior harbors. A new habitat type, flooded woods, was observed from the air in five places and likely represents new beaver colonization, but was not recorded because beaver sign was not positively identified.			
49	Smith, Douglas	1992	1992, 1994, and 1996 beaver survey maps	ISRO
	These three maps show the results of biannual aerial surveys to locate beaver lodges. The 1992 and 1994 legends shows active lodges with food caches, fresh beaver lodges with no cache, and areas of fresh cutting with no lodge or cache. The 1996 legend shows active lodges, inactive lodges, drained, inactive sets of ponds, and fresh houses with mud and peeled sticks.			

50	Smith, Douglas W.	1992	Apostle Islands beaver survey 1992	APIS
	The number of active beaver (*Castor canadensis*) colonies in the Apostle Islands was determined by aerial survey on 24 October 1992. Outer and Stockton Island were intensively surveyed, while Hermit and Sand were checked for beaver activity but not systematically sampled. The number of active colonies increased on Outer Island to a five year high of 30. This population increase is likely due to dispersers from established colonies occupying sites that do not have enough water during dry years. Active beaver colonies continued to decline on Stockton Island to an all time (since 1978) low of one. Bear predation may continue to play a role in this population decline. No beaver pond or lodge was observed on Hermit Island, and Sand Island had one drainage where beaver sign was observed.			
51	Smith, Douglas W.	1993	Earthwatch fall field report 1993, dispersal strategies and cooperative breeding in beavers	VOYA
	Twenty-one Earthwatch volunteers assisted with studies of beaver (*Castor canadensis*) in Voyageurs National Park, Minnesota during fall 1993. Research objectives were to continue long-term goals of studying beaver dispersal, family size, and habitat quality. A record number of 231 beavers were captured in 49 different colonies. Thirty colonies were completely trapped for an average colony size of 5.7 beavers. Mean family size for all 76 beaver colonies completely trapped during the three years of the study was 5.6 beavers. Kit production for 1993 was 1.4 kits per family, which was very close to the three year average of 1.3. Colonies in 1993 averaged 2.7 adults which was the highest of any year, slightly above the three year mean of 2.3 adults per colony. Twenty-one beavers from 19 ponds were radio implanted. All of these beaver remained at the ponds where they were radioed, except the beaver at Quarter-mile pond that was missing in late October. Studies of beaver habitat continued. DNA fingerprinting of 30 beavers last year revealed the presence of step-parents in beaver families.			
52	Smith, Douglas W.	1994	Isle Royale beaver studies 1994	ISRO
	The number of active beaver (*Castor canadensis*) colonies in Isle Royale National Park was determined by aerial census 9-11 October 1994. This is the eleventh population count in a series of surveys begun by Philip Shelton in 1962. Total number of beaver colonies with food caches was 137, and 6 other sites had beaver sign (fresh cutting or mud on lodge) for a total of 143 active sites. This was a decline in total active sites (-11%), but a stabilization in colonies with food caches compared to the 1992 census. Analyzed by habitat, all habitats (stream, lake, harbor, and 1936 burn) were stable except for a slight decline in colonies located in the 1936 burn area. Beaver colonies located on the inland lakes moved at a rate of 62% from 1990-92 and 60% from 1992-94. Only two colonies on the inland lakes were in the same location for all three surveys (1990, 1992, & 1994). There was one harbor colony on Duncan Bay.			
53	Smith, Douglas W.	1994	Earthwatch fall field report 1994, dispersal and cooperative breeding in beavers	VOYA
	Objectives this fall were to finish habitat surveys, radio track, observe beavers at their ponds, and trap certain source limited colonies to test the prediction that they would not have kits two years in a row. With their assistance, a total of 62 active beaver colonies were completely trapped and surveyed for habitat conditions (vegetation sampling); 31 more inactive ponds were surveyed for habitat conditions. Another fall activity was to sample vegetation at 12 ponds. A total of 534 beavers were captured and handled. Mean colony size for the entire study was 5.6, and mean reproduction/colony was 1.3 kits. Thirty-four beavers were radio-marked. Thirteen of 34 dispersed (38%); 11 dispersed as two-year-olds, and two dispersed as three-year-olds. Four of the 13 beavers left and were not contacted again. The other nine of 13 dispersers were contacted as they traveled, and of these, five have settled and are alive at new ponds. Of the remaining 21 radio-marked beavers, one moved with its entire colony, and 20 did not disperse; three (15%) of these philopatric beavers were killed by predators (wolves). Fifteen philopatric beavers are still alive.			
54	Smith, Douglas W.	1994	Beaver, Voyageurs National Park, Minnesota 1991-1993	VOYA
	Since 1991, Earthwatch teams have gathered data on beaver colony size, recruitment through immigration and births, habitat quality, and dispersal behavior. Crews live-trapped beavers, radio-marked them, monitored their movements, and counted trees and shrubs to measure habitat condition. Through repeated trapping, we have been able to determine physical measurements of each beaver age class - kit, yearling, and adult. We have found that age structure varies greatly. When aspen (primary food source) is scarce, beavers have fewer young or none at all. The Voyageurs beaver population has grown to such a level that they have saturated the area. As a result, the population has begun to decline.			
55	Smith, Douglas W.	1996	Isle Royale beaver study - 1996	ISRO
	The number of active beaver (*Castor canadensis*) colonies in Isle Royale National Park was determined by aerial census in 1996. This is the twelfth population count in a series of surveys begun in 1962. 143 actives sites were found; same number of active beaver sites as in 1994, but a decline in colonies with food caches was found. Colonies in all habitats declined slightly, except that there was an increase in harbor colonies.			

56	Smith, Douglas W.	1997	Dispersal strategies and cooperative breeding in beavers	VOYA
	"The population dynamics of beavers (*Castor canadensis*) have long been studied. Through these studies a dogma has emerged that "good" beaver habitat has plentiful aspen (*Populus tremuloides*). More recently some emphasis has been placed on the importance of aquatic vegetation (water lilies; Family *Nymphaeaceae*) to beavers. Little work, however, has gone into quantifying beaver habitat and relating it to beaver population phenomena to examine critically what really is "good" or high quality beaver habitat. A major focus of my study was to determine beaver habitat quality and relate it to beaver population dynamics, winter ecology, dispersal, and colony size and composition for two northern beaver populations in Wisconsin and Minnesota." (Partial abstract from author).			
57	Smith, Douglas W., Drummer, Thomas D., Peterson, Rolf O.	1994	Reply - Studies of beaver activity and body temperature: A historical perspective (1); Can J Zool	VOYA
	Bovet claims that Smith et al. (1991, Can. J. Zool. 69:2178-2182) and Dyck and MacArthur (1992, Can. J. Zool. 70: 1668-1672) analyzed their data on activity and body temperature of beavers (*Castor canadensis*) incorrectly because they ignored the likelihood that northern beavers in winter have activity rhythms with periods >24 h. The analysis by Smith et al. was in fact appropriate for demonstrating seasonal changes in body temperature and its correlation with activity. These are important issues because researchers have obtained conflicting results and because seasonal changes in activity and body temperature have implications for colony energetics in the context of food-hoarding behavior and social organization. (abstract)			
58	Smith, Douglas W., Peterson, Rolf O.	1988	The effects of regulated lake levels on beaver in Voyageurs National Park	VOYA
	Beavers in VOYA were studied to determine the effects of a winter water drawdown of 2 meters (3 meters annually) behind hydroelectric dams. Beaver lodges were counted from aircraft, and beavers were live trapped and radio implanted to examine the effects of drawdowns and vegetation on beaver. Active beaver lodge density was greatest on the drawdown lake Kabetogama, and was increasing at a higher rate on Kabetogama than on the slight drawdown lake Rainy. Beavers living in the drawdown environment abandoned their lodges overwinter. Food cache utilization and usage of aquatic vegetation was less in the drawdown areas. Above-ice foraging in winter and spring abandonment of the fall-winter homesite was more common in the drawdown locations. Variability and low sample sizes obscured interpretations, but beavers living in the drawdown environment came through winter in poorer condition. Overwinter mortality was not widespread. Springtime wolf predation due to low water levels was thought to be the major beaver mortality factor. Management recommendations were to change water management to approximate a more natural fluctuation.			
59	Smith, Douglas W., Peterson, Rolf O.	1991	Beaver ecology in Apostle Islands National Lakeshore	APIS
	Beavers (*Castor canadensis*) in the Apostle Islands National Lakeshore were studied from November 1987 to May 1990. Research objectives were to determine productivity, habitat quality, and recolonization potential of the islands in the event beavers were removed. Additionally, basic population parameters (mortality, movements, family size, physical measurements, and water conditions) were evaluated. The following statements characterize beaver ecology in the Apostle Islands: 1) low fecundity, 2) poor food resources, 3) seasonally variable water levels, 4) lodge site instability, and 5) probable bear predation on Stockton. If this is a valid assessment, beaver recolonization of depopulated Outer and Stockton Islands would be slow, but possible, given sufficient time. We offer 5 beaver management options: 1) no intervention - trapping prohibited, 2) trap beavers within state quotas, 3) controlled trapping, 4) beaver removal - zero population level, and 5) beaver removal in selected areas. We discuss these alternatives, their probable outcome and implementation.			
60	Smith, Douglas W., Peterson, Rolf O.	1991	Behavior of beaver in lakes with varying water levels in northern Minnesota; Environmental Management	VOYA
	We studied the effects of winter drawdowns (2.3 m) on beavers in Voyageurs National Park. Our study was designed to sample areas within the park that differed in water drawdown regime. Lodges were counted and beavers were live-trapped and radio-implanted to study behavior, movements, and mortality. Active beaver lodge density, determined by aerial survey in 1984 and 1986, was greatest along the shoreline of the drawdown reservoir. In winter beavers living on the drawdown reservoir spent less time inside their lodges than did beavers from stable water environments, foraged more above ice, and they were unable to fully store food. Only one case of starvation in the drawdown reservoir was documented, but beavers in reservoirs that were drawn down survived winter in poorer conditions than did beavers living in areas in which water levels remained high. In spite of an increasing population and lack of widespread mortality, winter water drawdowns did alter beaver behavior. To reduce these impacts, total annual water fluctuation should not exceed 1.5 m, and winter drawdown should not exceed 0.7 m. Possible management alternatives and costs are discussed.			

61	Smith, Douglas W., Peterson, Rolf O., Drummer, Thomas D., Sheputis, Daniel S.	1991	Over-winter activity and body temperature patterns in northern beavers; Can J Zool	VOYA
	Transmitters were implanted in three adult, one yearling, and one kit beaver (*Castor canadensis*) in northern Minnesota and upper Michigan to determine if core body temperature (Tb) declined in winter. In late October through early November, mean daily Tb of adults was 36.3 degrees C (range 34.5-37.6 degrees C), with a mean daily Tb fluctuation of 1.4 degrees C. From fall to winter adult beaver Tb declined at a mean rate of 0.01 C/day, and the mean daily winter (17 November - 15 April) Tb was 35.3 C (range 32.5 - 38.8 C). Mean daily winter Tb fluctuations 2.5 C. In early March, mean adult daily Tb began increasing at a rate of 0.03 C/day. Tb and activity were positively correlated, except for the kit beaver, which did not undergo a significant Tb decline during winter. The yearling beaver Tb declined at a slower rate than adult Tb, and its Tb was intermediate between that of the kit and the three adults. Continued body growth in winter in young beavers is probably enhanced by high body temperature. For adult beavers, reduced body temperature in winter may be an adaptation that facilitates survival during extreme resource scarcity. (abstract by author)			
62	Smith, Douglas W., Shelton, Philip C.	1990	Beaver survey Oct 16 & 19 1990	ISRO
	An original Isle Royale National Park 1:62500-scale topographic map with legend showing penciled in locations of active beaver colonies located by aerial survey in 1990.			
63	Smith, Douglas, W., Shelton, Philip, C.	1991	Isle Royale beaver studies 1990	ISRO
	The major focus of this work and the subject of this report were an aerial survey of active beaver colonies and visitation of 26 active sites along with live-trapping animals at two colonies. Poor flying conditions during this survey period prohibited accurate population counts. Contains maps showing locations of active beaver colonies.			
64	Smith, Douglas W., Thurber, Joanne M., Peterson, Rolf O.	1985	Studies of beaver and muskrat response to over-winter water drawdowns in Voyageurs National Park	VOYA
	Quarterly progress report summarizing activities pertaining to the second season of muskrat-beaver research being conducted in Voyageurs National Park. Animals were live-trapped and fitted with radio transmitters in order to gain information on colony sizes, specimen weights, kit production, and body temperatures.			
65	St. Croix National Scenic Riverway	1993	*Castor Canadensis*	SACN
	This file contains information from many different sources on various aspects of beaver biology. A guide to finding beaver information is provided in memo form, along with a general paper on beaver life in Wisconsin. Other information includes the impacts of beaver dam removal on summer water temperatures in a Northeastern Wisconsin trout stream, general ecology, articles and hand notes on beaver facts, water level management, stream alteration, wolf predation on beaver populations, and beaver damage complaint trends in Wisconsin.			
66	Wisconsin Department Of Natural Resources	1990	Beaver management plan	SACN
	This report gives a general overview of the program, the various management zones (with map), regional population estimates and population dynamics, and goals and methods of the plan. It includes funding and education efforts. The St. Croix/Namekagon rivers are a feature of the program.			
67	Wisconsin Department Of Natural Resources	1994	An update on beaver management in Wisconsin	SACN
	This is an update of the plan developed in 1990. An overview of the need for management, the history of beaver/human use, and the plan are presented. Also included are survey results and current research, harvest surveys and management, beaver control program, and future actions. There is a map of the four state zones and three graphs which shows beaver harvests, resident trapping licenses, and average beaver pelt price.			
DEER				
1	author unknown	1985	Slash set in Manitou deer herd; the Leelanau enterprise	SLBE
	The article discusses the National Park Service's plan to increase the white-tailed deer harvest limit to three for the 1985 North Manitou Island deer hunt.			

2	author unknown	1991	155 Deer are taken in N Manitou hunts; The Leelanau enterprise	SLBE
	The article summarizes the deer hunt statistics for the first half of the 1991 deer hunt on North Manitou Island.			
3	author unknown	1995	White-tailed deer surveys at Indiana Dunes National Lakeshore	INDU
	Tables showing results of spotlight and aerial surveys for white-tailed deer (*Odocoileus virginianus*) at Indiana Dunes National Lakeshore between January 1988 and February 1995. Short paragraph describing deer population movements and trends.			
4	author unknown	1996	Deer spotlight survey data	INDU
	These maps indicate deer seen during spotlight surveys carried out on five separate days in various locations throughout the park. Deer numbers and sexes were marked at their appropriate locations on the maps.			
5	author unknown	1999	National Lakeshore tells deer count results; Chesterton tribune	INDU
	The article discusses the nine-year results of the spotlight deer survey conducted at Indiana Dunes National Lakeshore annually. The article also mentions the new deer exclosure monitoring study and rare plants study.			
6	Balgooyen, Christine P.	1994	Monitoring impacts of white-tailed deer: indicators of grazing and browsing pressure on the Apostle Islands and adjacent mainland	APIS
	In the summer of 1993 we investigated the response of northern Wisconsin plant species to a range of recent (1980s - 90s) and historical (1950s - 60s) deer densities. We examined both woody and herbaceous species, focusing particular attention on bluebead lily (*Clintonia borealis*). The frequency of several woody species apparently declined in response to recent deer browsing, including mountain maple (*Acer spicatum*), yellow birch (*Betula allegheniensis*) and mountain ash (*Sorbus decora*). Both past and present deer browsing affected the frequency of Canada yew (*Taxus canadensis*). The frequencies of herbaceous species, including wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), and *Clintonia* , declined in response to estimated historical deer densities. The frequency and percent cover of *Clintonia* , however, also declined in response to recent deer density, as did species richness. In areas where *Clintonia* is present, monitoring its populations may serve as a reliable and efficient indicator of grazing damage to both common and rare species. Deer have both immediate and lasting effects on herbaceous community structure.			
7	Beals, Edward	1958	The phytosociology of the Apostle Islands and the influence of deer on the vegetation	APIS
	Sixty-six stands of forest vegetation on the Apostle Islands were studied. The stands were sampled for tree, sapling, and available browse data, by the point-centered quarter method; and for herb and shrub frequency by the one-meter quadrat method. Damage to the browse by deer was also recorded.			
8	Beals, Edward, Cottam, Grant, Vogl, R.J.	1960	Influence of deer on vegetation of the Apostle Islands, Wisconsin; Journal of Wildlife Management	APIS
	Seventy-six stands of forest vegetation on the Apostle Islands were sampled for browse stems by the point-centered quarter method. Damage to the browse by deer was also recorded. The stands represented a number of vegetation types, including pine, aspen, oak, hemlock, sugar maple, and yellow birch-white cedar forests. The last-mentioned type predominated in the region. Indices were prepared for browse pressure, and density of browse. Cedar saplings and yew tend to decrease in density with increased browse pressure, while mountain maple tends in increase. Yew was preferred by deer to any other coniferous food. Deciduous foods such as mountain maple are an important part of the cervine diet, and these may be much more heavily browsed than cedar if yew is plentiful enough to provide sufficient coniferous food. The best habitat for deer appears to be the unbrowsed yellow-birch-white cedar stands. When these stands are subjected to moderate or heavy browsing, however, their food value diminishes rapidly.			
9	Berner, A.H., Simon, D.E.	1993	The white-tailed deer in Minnesota's farmland: The 1960's	SACN
	A brief history of white-tailed deer populations and management in Minnesota's farmlands from settlement to 1970. Prior to the 1960's the overview is very general. However, from 1961, as deer management has become more intensive, harvest data are more detailed.			
10	Bienz, Craig S.	1981	A telemetric appraisal of daily and seasonal activity of female white-tailed deer in a northern Michigan enclosure	PIRO
	no abstract available			

11	Campbell, Al	1983	Study urges public hunt of N Manitou deer herd; The Leelanau enterprise	SLBE
	The article discusses the future purchase of North Manitou Island by the National Park Service. It also describes the need for a special hunt on the island to reduce the number of white-tailed deer. Winter starvation and damage to vegetation are cited as impacts of high population numbers.			
12	Case, David J., Mccullough, Dale R.	1982	The white-tailed deer of North Manitou Island, Michigan	SLBE
	Studied the implications concerning white-tailed deer (*Odocoileus virginianus*) and the vegetation of North Manitou Island, Sleeping Bear Dunes National Lakeshore. Data were collected concerning habitat condition, the production of woody vegetation within deer reach, and the impact of deer feeding on recovering vegetation. Vegetation types were mapped and described. The history, size, composition, reproduction, winter mortality, seasonal food habits, and physical condition of the deer population were studied. Recommendations are provided for the management of the deer herd and habitat, and future monitoring of the deer population and the condition of the habitat.			
13	Case, David J., Mccullough, Dale R.	1987	White-tailed deer forage on alewives; Journal of Mammalogy	SLBE
	An observation of white tailed deer (*Odocoileus virginianus*) foraging on dead alewives (*Pomolobus pseudoharengus*) on beaches on North Manitou Island, Sleeping Bear Dunes National Lakeshore, Michigan. The number of visits, the length of visits, and the number of alewives consumed were recorded for a total of 15.6 hours from May 28 to June 12, 1982. The nutritional value of alewives is compared to natural deer food.			
14	Case, David J., Mccullough, Dale R.	1987	The white-tailed deer of North Manitou Island; Hilgardia	SLBE
	A study of the white-tailed deer (*Odocoileus virginianus*) population on North Manitou Island, Sleeping Bear Dunes National Lakeshore, Michigan. A total of nine white-tailed deer were introduced to the island in 1926. The population size and demographics were estimated by line-transect and pellet-group methods in the 1970's. Surveys of winter mortality were taken. The physical condition of the population was determined by conducting autopsies on 32 collected deer. Rumen analysis was conducted on 31 of the 32 collected deer. The vegetation of the island was studied. Vegetation was measured in a deer exclosure constructed in 1962. The effect of deer on the rate of old field succession was studied. There are maps showing vegetation, transect locations, count routes, areas of census, and deer winter concentration areas.			
15	Case, Dave, Seng, Phil	1999	Dunes region deer study committee: Final report	INDU
	The report describes the concerns of the Dunes Region Deer Study Committee and their suggestions for future management and control of the population. The area of concern included land east of Michigan City, west of the industrial complex, north of Interstate 94, and south of Lake Michigan. Indiana Dunes National Lakeshore, Indiana Dunes State Park, Dune Acres, and Beverly Shores all fall within this area and were included for consideration. Suggestions for future monitoring were also made.			
16	Cole, Glen F.	1981	Black bear and white-tailed deer removals	VOYA
	Brief report to the superintendent presenting data on known removals of black bear and white-tailed deer from Voyageurs National Park. Includes data from hunting on private lands within the park, removals by park staff, and other kills.			
17	Cole, Glen F.	1981	Alternative hypothesis on ecological effects of meningeal parasite (*Parelaphostrongylus tenuis*); Journal of the Minnesota Academy of Science	VOYA
	Parelaphostrongylus tenuis is a ubiquitous parasite of white-tailed deer (*Odocoileus virginianus*) that can cause mortality in woodland caribou (*Rangifer tarandus*) and moose (*Alces alces*). A hypothesis that *P. tenuis* prevents overlapping distributions of these species in southern boreal regions was inconsistent with distribution records. A revised hypothesis that *P. tenuis* does not prevent overlapping distributions if deer exist at natural densities was consistent with these records but did not state the parasite's ecological effects. A hypothesis that *P. tenuis* allows deer to outcompete woodland caribou or moose on portions of natural environments or in man-modified environments where deer densities are relatively high appeared to be consistent with published accounts of mortality from the parasite and other reviewed literature. Thus, statements that *P. tenuis* either does or does not prevent or restrict overlapping distributions of woodland caribou and or moose with white-tailed deer need to be further qualified. (Abstract by author) Article draws on species distribution information obtained in areas of Voyageurs National Park.			

18	Cole, Glen F.	1985	Changes in interacting species with disturbance	VOYA
	A system of sixteen interacting native herbivores and carnivores became less diverse, less stable and less productive over an 85 year period after uncontrolled hunting eliminated woodland caribou (*Rangifer tarandus*) and elk (*Cervus elaphus*) and reduced moose (*Alces alces*). Declines in total cervid biomass and food for carnivores were deferred for about 40 years by compensating increases in deer as other cervids became less abundant or absent. Deer subsequently declined as succession on previously logged and burned areas reduced low shrub areas. Increased competition for reduced food caused carnivores to reduce their own diversity and abundance and overexploit some prey species. The system's diversity in species with different abilities to maintain or change the stability of their own or other populations suggested a possible solution to the problem of predicting the stability of populations in disturbed systems. The changes in diversity, stability and biomass of the studied fauna are used to develop generic hypotheses for initially predicting and subsequently measuring the effects of disturbance or restoration programs on interacting species.(Abstract by author)			
19	Cole, Glen F.	1987	Changes in interacting species with disturbance; Environmental Management	VOYA
	Human-influenced changes in the diversity and abundance of native wildlife in a southern boreal forest are used to develop working hypotheses for predicting and measuring the effects of disturbance on groups of interacting species. Changes began with early 1900 hunting, which eliminated woodland caribou (*Rangifer tarandus*) and elk (*Cervus elaphus*), and reduced moose (*Alces alces*) to the low numbers which still persist. Increases in white-tailed deer (*Odocoileus virginianus*), as these other cervid species became less abundant or absent, provided enough alternative food to sustain the system's carnivores until plant succession on previously burned or logged areas also caused deer to decline. With increased competition for reduced food, carnivore species also became less abundant or absent. The abilities of interacting species to maintain dynamically stable populations or persist varied with their different capacities to compensate for increased exploitation or competition. The hypothesis that the increased protection of wildlife from exploitation in a national park would restore a more diverse, abundant, and productive fauna had to be rejected.			
20	Columbus Aerial Mapping	no date	Untitled: Purdue University deer vegetation sites	INDU
	These topographic maps show locations of vegetation plots used by Purdue University researchers for a deer browsing study. Each mark on the map indicates a plot where vegetation was sampled.			
21	Corinth, Russell L.	2002	Vegetation and white-tailed deer in beaver basin, pictured rocks national lakeshore, 1996-1999	PIRO
	The objectives of the study were to determine the change in vegetation in Beaver Basin since 1980, to analyze the vegetation that was being used by white-tailed deer as browse, and to estimate the deer population in an historic deer yard. It was found that the vegetation in Beaver Basin had changed very little since 1980, the deer preferred mountain maple (*Acer spicatum*), American beech (*Fagus grandifolia*), and striped maple (*Acer pennsylvanicum*) as browse, and no deer were detected wintering in the historic deer yard.			
22	Corinth, Russell, Robinson, William L.	1997	The status of vegetation and white-tailed deer on Beaver Basin, Pictured Rocks National Lakeshore. Lake Superior National Parks research conference. (Abstract)	PIRO
	White-tailed deer (*Odocoileus virginianus*) are being studied over a 3 yr period in Beaver Basin of Pictured Rocks National Lakeshore, MI as part of a continuing study begun in 1974. Winter deer population and changes in amounts of browse have been measured. Researchers are also seeking evidence of wolf (*Canis lupus*), a prey species. Preliminary results indicate a 3-fold increase in available browse since 1980. Winter track surveys indicated zero deer in Beaver Basin during the winter of 1996-97.			
23	Davich, Jerry	1999	Aerial deer survey set for next year at Dunes; The Times	INDU
	The article mentions an upcoming aerial, infrared deer survey to be conducted at Indiana Dunes National Lakeshore. Deer culling activities at Indiana Dunes State Park are also discussed and opinions on deer management were obtained from hunters.			
24	Davich, Jerry	1999	Deer study committee re-outlines its objectives; Vidette times	INDU
	The article discusses the reasons used for choosing the urban deer zone boundaries in the area including Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres. The boundaries were chosen by the Dunes Region Deer Study Committee, a group formed to aid in the determination of appropriate deer control methods in the area.			

25	Davich, Jerry	1999	Surveys offer potential data; Vidette times	INDU
	The article discusses the results of the 1999 white-tailed deer spotlight survey and how they relate to the deer overabundance debate occurring in the area at the time. It was determined by park staff that this survey alone would not aid in designing a deer management plan for the Lakeshore or the surrounding communities. In order to determine the effects the deer population had on the vegetation of the area, a deer exclosure and a rare plant study were begun.			
26	Davich, Jerry	1999	Deer group misses tough issues; Vidette times	INDU
	The article discusses the controversies encountered during the Dunes Region Deer Study Committee's final meeting. The committee was formed to determine the preferred white-tailed deer control methods to be used in the area including Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
27	Davich, Jerry	2000	Aerial 'snapshot' gives idea of deer population; The Times	INDU
	The article discusses the results of the March 23, 2000 aerial, infrared white-tailed deer survey at Indiana Dunes National Lakeshore. Other survey methods and the possibility of a contraceptive program at Beverly Dunes, IN are also mentioned.			
28	Davis, Larry	2000	Aerial infrared deer count report: Beverly Shores, IN	INDU
	The document reports the results of an aerial, infrared deer count conducted over Beverly Shore, IN. Deer were counted using a high-resolution thermal imager with a video encoder-decoder (VED). Data collected included GPS positions, time, date, speed, and altitude. Methods and assumptions are described.			
29	Davis, Larry	2000	Aerial infrared deer count report: Indiana Dunes National Lakeshore, Indiana Dunes State Park & Beverly Shores, IN	INDU
	The document reports the results of an aerial, infrared deer survey flown over Indiana Dunes National Lakeshore, Indiana Dunes State Park, and Beverly Shores, IN. A high-resolution thermal imager with a video-encoder-decoder was used to count deer. GPS positions, time, date, speed, and altitude were also collected. The methods and assumptions are described in the report.			
30	Davis, Larry	2001	Aerial infrared deer count report: Indiana Dunes National Lakeshore	INDU
	The report describes the methods used in conducting an aerial infrared deer count at Indiana Dunes National Lakeshore. Surveys were flown using a high-resolution thermal imager with a video output. GPS-derived positions, time, date, speed, and altitude were all recorded by the video encoder-decoder (VED). Assumptions are discussed and the results are reported. Maps of deer locations are included.			
31	Deal, Ulysses S.	1978	Metabolic indicators of habitat differences in four Minnesota deer populations; Journal of Wildlife Management	VOYA
	"Blood samples were collected from 40 white-tailed deer (*Odocoileus virginianus*) from 4 winter yards in Northeastern Minnesota. Results from the blood assays were examined for the effects of age, sex, capture date, capture method, disease and location." (Excerpt from author's abstract) Study area was in Superior National Forest, adjacent to Voyageurs National Park.			
32	Delgiudice, Glenn D., Mech, L. David, Kunkel, Kyran E., Gese, Eric M., Seal, Ulysses S.	1992	Seasonal patterns of weight, hematology, and serum characteristics of free-ranging female white-tailed deer in Minnesota; Canadian Journal of Zoology	VOYA
	"Weights, hematology, and serum profiles of white-tailed does in the central Superior National Forest of northeastern Minnesota were examined year-round to determine seasonal patterns of nutritional condition and metabolism." "Seasonal patterns were most evident for hemoglobin concentration, red blood cells, packed cell volume, serum total protein, urea nitrogen, creatinine, the urea N to creatinine ratio, triiodothyronine, cortisol, and potassium. Wide seasonal variations of these characteristics were indicative of shifts in the deer's metabolic physiology." Findings are compared with data from deer on more southern ranges. (Quotes from author's abstract)			
33	Dorrance, Michael J., Savage, Patrick J., Huff, Dan E.	1975	Effects of snowmobiles on white-tailed deer; Journal of Wildlife Mangement	VOYA
	This paper reports on the effects of snowmobile traffic on home range size, daily activity, and movement of white-tailed deer during the winters of 1972-73 and 1973-74 in Minnesota.			

34	EDAW, Inc.	2003	Deer management plan: Final internal scoping report	INDU
	The scoping report identifies the impacts an overabundance of white-tailed deer may have on other wildlife at the park, vegetation and rare plants, cultural resources, and the socioeconomics of the surrounding area. Policies and legislation that may affect future deer population management are explored, and objectives in taking action to control the population are outlined. Six possible action alternatives are described, and six rejected alternatives are briefly mentioned. The appendix includes the Dunes Region Deer Study Committee Final Report.			
35	Engquist, Dale B.; Bacone, John A.	1998	no title	INDU
	The letter discusses the studies being conducted to determine the general abundance of white-tailed deer at Indiana Dunes National Lakeshore and their effects on plant species. Methods for a deer exclosure survey are described. An ongoing spotlight survey is also mentioned. The letter from Mr. Bacone requesting information on studies at the park is attached.			
36	Fanter, Lloyd H.	1977	A study of populations and behavior of white-tailed deer in Beaver Basin, Michigan	PIRO
	Field studies were conducted on a population of white-tailed deer (*Odocoileus virginianus*) in Beaver Basin (acquired by Pictured Rocks National Lakeshore, MI in 1974) from 1974-76. The herd had been artificially maintained with supplemental feeding during the winter months from 1960-76 with a reduced feeding program the last two winters. Results of a browse survey were used to show utilization patterns by tree species and to calculate the carrying capacity of the basin. Winter mortality from malnutrition, predation, hunter-inflicted wounds, and drowning was estimated by averaging the results of two methods: modified King's method and continual search for dead deer. Fat content of femur bone marrow was calculated. Behavioral observations about dominance and aggression (ear drop, hard look, sidle, rush, strike, strike-lunge, and flail) were made as competition for food resources diminished. Photographs of deer behavior are included as well as aerial photographs of Beaver Basin. Summer range information and management recommendations are also provided.			
37	Flaspohler, David, Bassett, Audra, Hurley, Peter, Rosemier, Justin, Beachy, Brian	2003	The ecological legacy of historically high white-tailed deer densities at Sleeping Bear Dunes National Lakeshore. Western Great Lakes research conference and Chequamegon Bay area natural resource conference (Abstract)	SLBE
	Historically, white-tailed deer populations were maintained at high levels on North Manitou Island while South Manitou Island has remained relatively deer-free. Features likely to be affected by deer browse were studied on both islands and the mainland, and the results were compared.			
38	Foster, W.H.	1917	Review of wildlife - Isle Royale - 1916-1917; Michigan Sportsman	ISRO
	A commentary on the wildlife present on Isle Royale during a 1916 visit including sightings of "wolves" (probably coyotes), caribou, white-tailed deer, pintail grouse, lynx, prairie chicken, mink, and marten. The author estimates that 67 lynx and 25 "wolves" were taken by trappers in 1916 in an attempt to eliminate predators from the island.			
39	Fuller, Todd K.	no date	Deer-wolf interaction study - annual project summaries, summer, 1985	VOYA
	Summaries of ongoing research concerning the interactions of white-tailed deer, wolves and hunters in north central Minnesota that was initiated in fall 1980 by the Minnesota Department of Natural Resources. Describes capture results and radio-collar data collected on wolves and their prey habits.			
40	Fuller, Todd K., Coy, Pamela L., Peterson, William J.	1986	Marrow fat relationships among leg bones of white-tailed deer; Wildlife Society Bulletin	VOYA
	"This paper presents equations to predict femur marrow fat content from other leg bones and compares the apparent sequence of marrow fat mobilization in white-tailed deer with that of other species." (Excerpt from authors Intro). Study was conducted utilizing deer carcasses from the areas surrounding Voyageurs National Park.			
41	Gallagher, Brian	1999	No trend seen in deer population; News-dispatch	INDU
	The article describes the monitoring being conducted by Indiana Dunes National Lakeshore to determine the size of the deer population at the park and the extent of damage caused to plants by browsing. No trends were detected via spotlight surveys. The possibility of conducting deer exclosure and rare plant surveys is also discussed.			

42	Gill, James S., McLean, Robert G., Shriner, Ronald B., Johnson, Russell C.	1994	Serologic surveillance for the Lyme disease spirochete, *Borrelia burgdorferi* , in Minnesota using white-tailed deer as sentinel animals; Journal of clinical microbiology	SACN
	The article discusses a study conducted to confirm that white-tailed deer may be used as sentinel animals in serologic surveillance programs. Samples were collected during the regular firearms hunting season by hunters.			
43	Gogan, Peter J.P.	1989	The role of white-tailed deer in forest system ecodynamics - a pre-proposal	VOYA
	Research proposal submitted for approval. This study proposes to evaluate the impact of white-tailed deer on the vegetation of Voyageurs National Park within the context of an evaluation of the minimal size area/boundary ratio required to protect native plant species from deer feeding. The proposal consists of three elements: 1) census techniques 2) measuring the status of native plant species relative to deer density, and 3) deer food habits.			
44	Gogan, Peter J.P.	1992	NPS ungulate questionnaire, Voyageurs National Park (*Odocoileus virginianus*)	VOYA
	Completed ungulate questionnaires on white-tailed deer for a study conducted by the University of Idaho Cooperative Park Studies Unit. Peter Gogan, Research Wildlife Biologist, Voyageurs National Park filled in the requested information. Questionnaire covers a wide variety of topics relating to habitat, predation, mortality factors including hunting pressures, management techniques utilized, management concerns, and general comments.			
45	Gogan, Peter J.P., Kozie, Karin D., Olexa, Edward M., Duncan, Nancy S.	1997	Ecological status of moose and white-tailed deer at Voyageurs National Park; Alces	VOYA
	"We examined the status and recent trends in numbers and distribution of moose and white-tailed deer along with prevalence of meningeal worm in both species at Voyageurs National Park, Minnesota. Aerial counts indicated deer occurred at a winter density of 8.37/km2 throughout the park in 1992 while moose occurred at a density of 0.23/km2 with a more limited distribution. Meningeal worm larvae occurred in 80% of the deer pellet groups examined in 1978 and 76% of the pellet groups examined in 1988 and 1989. Adult meningeal worms were found in 80% of the deer heads examined. A single doral-spined larva was recovered from 1 of 22 moose fecal samples. We conclude that white-tailed deer and moose have occurred sympatrically at VNP though at least the 1980s. There is no direct evidence that meningeal worm is a mortality factor in adult moose at the park." (Abstract by authors)			
46	Gordon, Charles	1991	798 North Manitou hunters got 414 deer; Traverse City record-eagle	SLBE
	The success rate of the 1991 white-tailed deer hunt on North Manitou Island is discussed. The policies of the park pertaining to the hunts and management of white-tailed deer on the island are also described.			
47	Hall, Nelson Clarence	1971	The Hall outdoor journals of the Beaver Lake Basin, 1912-1966	PIRO
	Nelson Clarence Hall (1891-1980) kept a diary of his experiences and observations at his family's cabin near the mouth of Beaver Creek in what is now Pictured Rocks National Lakeshore, MI from 1912-1966. There are only a few years without a journal entry. Beginning in 1925 most of the entries are from November and relate to deer and bear hunting, the weather and storms, excursions from the camp, and the state of the cabin. There were occasional summer visits. Included are photographs of Pictured Rocks cliffs (1912 and 1921), Beaver Lake (1912 and 1946), Beaver Creek (1912, 1922, 1931, and 1938), Kingston Lake in 1922, and Grand Island in 1928. Visual effect of logging is evident in some of the photographs. Photographs document a footbridge that the family constructed across Beaver Creek in 1912; it was replaced in 1938. Mention is made of a load of pulp logs from Canada that escaped the boom and landed ashore near the mouth of Beaver Creek on Lake Superior in May of 1960.			
48	Holden, Max W.	1998	South Manitou Island white-tailed deer elimination program	SLBE
	South Manitou Island contains a number of rare and threatened plant species, some not found anywhere else in Michigan. When white-tailed deer species were found to have invaded the island, the National Park Service decided to eradicate the population before it did any damage to the vegetation as the North Manitou Island population did. The report outlines the participants, time frame, communications, methods, and risks of the elimination program.			
49	Holmes, Michelle	1999	Report covers deer survey, watercraft; News-dispatch	INDU
	The article discusses a report released by the National Park Service at Indiana Dunes National Lakeshore containing a number of changes and improvements to be made at the Lakeshore. An increase of deer surveys, a possible deer management plan, a ruling on personal watercraft use within the Lakeshore, and a number of structural improvements are described.			

50	Irwin, Larry W.	1975	Deer-moose relationships on a burn in northeastern Minnesota; Journal of Wildlife Management	VOYA
51	Jensen, William F.	1982	Vegetation analysis and an analytical model of the Beaver Basin deer yard	PIRO
	The effects on vegetation of browsing by deer were studied at Beaver Basin in Pictured Rocks National Lakeshore, MI following years of supplemental winter feeding that resulted in a population that exceeded its carrying capacity. Browse production at 60 sample plots in each of 3 vegetation types (conifer swamp, mixed conifer-hardwoods, and hardwoods) was determined using the cut-dry-weigh method. Canopy vegetation was also analyzed. Presence or absence of herbivory, herbivory by hare or deer, and species of browse were noted. Rumen contents were analyzed from deer carcasses when possible.			
52	Jones, Steven L., Jensen, William F., Robinson, William L.	1979	Final report on deer research in Beaver Basin, winter 1978-79	PIRO
	The white-tailed deer (*Odocoileus virginianus*) population was studied in Beaver Basin, Pictured Rocks National Lakeshore, from 1978-79 after years of supplemental winter feeding. Deer movement was monitored and estimates of their numbers were made using self-attaching collars, mark-recapture techniques, and observation of distinct individuals. Lincoln Index and a modified Schnabel formula were used to estimate a deer population of 193. Mortality numbers were estimated by systematic searches, chance encounters, and follow-up on scavenger and predator activity. Jaw and femur bones were taken to determine age from the teeth and general health from the fat content of the marrow. Rumen samples were examined, when possible, for information on diet just prior to death. Data on browse availability and utilization from 60 plots are presented. Deer population paralleled the reduction of the supplemental feeding and declined from an estimated 624 animals in 1974-75 to 106 animals in 1978-79. Notes about 15 other mammal species observed are included, as well as data on 23 bird species and the first sightings of migratory birds in the spring.			
53	Kozie, Karin D.	1988	Absent and declining wildlife at Voyageurs National Park summer 1988 field work progress report	VOYA
	The white-tailed deer population in Voyageurs National Park is believed to be declining due to changes in land use practices. Previous fire suppression and the abolishment of logging in VNP has caused vegetation to return to more climax stages, resulting in sub-optimal habitat for white-tailed deer. However, no reliable census data exists. Current research in VNP involves estimating white-tailed deer numbers through aerial census and pellet group counts. Work accomplished during June - September 1988 involved field checking and sampling vegetation along pellet group transects in preparation for spring 1989 counts. [This report] describes methods used in selecting transects and sampling vegetation. Aerial census will be done during winter months. (Abstract by author)			
54	Kozie, Karin D.	1989	Absent and declining wildlife at Voyageurs National Park	VOYA
	Voyageurs National Park is currently collecting baseline data on the population status and habitat use of white-tailed deer within the park. This progress report focuses on census results from spring 1989 pellet group counts. Results on the incidence of meningeal worm in deer and moose pellets and deer craniums, fecal nitrogen content in deer and moose pellets, and spring movements and survival of radio-collared deer are also presented.			
55	Kwilosz, John, Knutson, Randy	1999	White-tailed deer: how many are too many?; Singing sands almanac	INDU
	The article describes white-tailed deer management efforts at Indiana Dunes National Lakeshore. Different attitudes toward deer are discussed, and the lakeshore's enabling legislation requirements are mentioned. Two studies, the spotlight survey and deer exclosure vegetation monitoring, are also discussed.			
56	Lenarz, Mark S.	1992	The white-tailed deer of Minnesota's forested zone: harvest, population trends, and modeling, 1992	VOYA
	Annual report presenting data on population trends, model projections, and buck harvest/sq. mile. Includes data from the counties of and surrounding Voyageurs National Park.			
57	Lenarz, Mark S.	1993	White-tailed deer of Minnesota's forested zone: harvest, population trends, and modeling 1993	VOYA
	Annual report presenting data on population trends, model projections, and buck harvest/sq. mile. Includes data from the counties of and surrounding Voyageurs National Park.			

58	Lenarz, Mark S.	1995	White-tailed deer of Minnesota's forested zone: harvest, population trends, and modeling 1995	VOYA
	Summary report which details numbers of hunters registered, harvest statistics, and population densities in areas surrounding Voyageurs National Park for the 1994 harvest season.			
59	Lenarz, Mark S.	1996	White-tailed deer of Minnesota's forested zone: harvest, population trends, and modeling 1996	VOYA
	Summary report which details numbers of hunters registered, harvest statistics, and population densities in areas surrounding Voyageurs National Park for the 1995 harvest season.			
60	Mason, Dan	2003	Cowles bog floristic resources restoration	INDU
	Indiana Dunes National Lakeshore worked with numerous partners and participants to restore native vegetation to Cowles Bog. Methods used included building deer exclosures, propagating white cedar, reducing shrub cover and hybrid cattails, installing native plants, recovering orchids, and analyzing seed banks.			
61	Mccann, Robert	1973	Field notes on mammals and amphibians of Pictured Rocks National Lakeshore area	PIRO
	Five trap lines were set for small mammals using 100 "museum special" traps, baited with peanut butter and oatmeal, in Alger County, MI from July 30-August 8, 1973. One trap line was within the "fee zone" of Pictured Rocks National Lakeshore at the Twelvemile Beach Campground area. Another site near the Mosquito River was in the Inland buffer Zone of the Lakeshore. Notes were made on sex, breeding condition, molt, ectoparasites, abnormalities, and the "standard measurements".			
62	Mccullough, Dale R., Case, David J.	1980	Progress report: the white-tailed deer of North Manitou Island, Michigan	SLBE
	A comprehensive progress report of white-tailed deer (*Odocoileus virginianus*) research conducted on North Manitou Island in Sleeping Bear Dunes National Lakeshore. Systematic deer counts were made to determine population size and demographics. Dead deer were counted to estimate the winter mortality rate. Deer were collected and analyzed to determine the health of the population. There is a description of the vegetation found on the island. The future plans of the study are presented. There is a map showing the routes used for deer counts.			
63	Mccullough, Dale, R., Case, David, J.	1982	Supplemental report : the white-tailed deer of North Manitou Island, Michigan	SLBE
	A survey of dead white-tailed deer (*Odocoileus virginianus*) on North Manitou Island was conducted to determine the winter mortality during the winter of 1981-82. The high mortality is due to a high deer population and no natural predators. The method of counting consisted of searching an area totaling 106 hectares and searching 15, 50 x 1000 m (totaling 75 hectares) plots to make estimates at the total deer mortality on the island.			
64	Mech, L. David	1992	Prevalence of antibody titers to *Leptospira* spp in Minnesota white-tailed deer; Journal of Wildlife Diseases	VOYA
	Blood samples were taken from 124 white-tailed deer in northeastern Minnesota from 1984 to 1989 and tested for antibodies to six serovars of *Leptospira interrogans* . Results showed a wide variability in exposure of Minnesota deer to this disease.			
65	Mech, L. David, McRoberts, R. E., Peterson, Rolf O., Page, R. E.	1987	Relationship of deer and moose populations to previous winter's snow; Journal of Animal Ecology	ISRO, VOYA
	Linear regression was used to relate snow accumulation during single and consecutive winters with white-tailed deer (*Odocoileus virginianus*) fawn:doe ratios, moose (*Alces alces*) twinning rates and calf:cow ratios, and annual changes in deer and moose populations. Data was collected from Isle Royale National Park and the Superior National Forest (directly adjacent to Voyageurs National Park).			

66	Minnesota Department Of Natural Resources	1977	Deer-moose relationships (with emphasis on *Parelaphostrongylus tenuis*); Minn Wildl Res Q	VOYA
	Paralaphostronglus tenuis, a parasitic nematode normally found in white-tailed deer (*Odocoileus virginianus*), is the etiological agent of cerebrospinal nematodiasis in moose (*Alecs alces*) and other cervids. Deer heads collected from central and northern Minnesota during the 1965 deer season and examined for adult worms showed that the greater incidence of the parasite was in the central portion of the state, an area with a relatively high deer population. Random collections of deer feces and examination of deer heads from northeastern Minnesota showed the same distribution of the parasite. Moose pellets from northeastern Minnesota and Isle Royale, Michigan indicated an incidence of less than 1% of this parasite in "normal" moose, but larvae were present in only 29% of the diseased moose examined. A suitable gastropod population exists in northern Minnesota for the development of *P. tenuis* in deer and moose. High deer populations with their attendant parasites serve as a limiting factor to the expansion of the moose range and the reintroduction of woodland caribou in Minnesota.			
67	Minnesota Department Of Natural Resources	1990	Aerial census of deer populations in Washington County	SACN
	Annual census of deer population in Washington County. Ongoing monitoring.			
68	Minnesota Department Of Natural Resources	no date	Assessment of effect of deer browse on native vegetation	SACN
	Ongoing assessment of the effects of deer on native vegetation in Metro area state parks.			
69	Mooty, Jack J., Karns, Patrick D., Fuller, Todd K.	1987	Habitat use and seasonal range size of white-tailed deer in north central Minnesota; Journal Wildlife Management	VOYA
	"Seventeen radio-collared female white-tailed deer (*Odocoileus virginianus*) were monitored during 1968-74 in north central Minnesota to determine their use of plant communities. During January -October, the Balsam Fir (*Abies balsamea*) -Trembling Aspen (*Populus tremuloides*) -Paper Birch (*Betula papyrifera*) Community was used by deer more than expected. It probably provided the best winter cover and was a floristically rich community that provided high quality food. Home range size was largest in April-May and smallest in January. " (Excerpt from author's abstract)			
70	National Park Service and Michigan Department of Natural Resources	1985	Manitou Islands deer management plan, Sleeping Bear Dunes National Lakeshore, Michigan	SLBE
	The report discusses the history of white-tailed deer on North Manitou Island, the impact the population has had on the island vegetation, and the management objectives for controlling the herd. The reduction of the herd through recreational hunting is outlined, as well. White-tailed deer management on South Manitou Island is also discussed.			
71	Nelson, Michael E., Mech, L. David	1984	Home-range formation and dispersal of deer in northeastern Minnesota; Journal of Mammalogy	VOYA
	"Eleven white-tailed deer (*Odocoileus virginanus*) does and their offspring (10 male and 6 female fawns) were radio-tracked for up to 56 months (2,725 total deer locations) in Minnesota's Superior National Forest from November 1974 through August 1983. All fawns wintered in yards with their does and migrated in spring to their does' summer ranges where they then separated from the does. By 17 months of age, seven males had established new summer ranges up to 9.6 km away, whereas the other three used the same summer ranges as their does, up to at least 29 months of age. One male established a new winter range, but six others continued to use the winter ranges of their does. The female fawns used the same summer range as their does, or areas immediately adjacent, and migrated to and from the same winter ranges, some with their does, for up to 3 years of age. The one female we followed beyond this age migrated separately to and from the same winter yard during her fifth year. The data fit the hypothesis that non-incestuous inbreeding is common in vertebrates." (Abstract by author)			
72	Nelson, Michael E., Mech, L. David	1986	Mortality of white-tailed deer in northeastern Minnesota; Journal of Wildlife Management	VOYA
	Two-hundred and nine white-tailed deer were radio tracked in the central Superior National Forest, Minnesota from 1973 through winter of 1984-85. Eighty-five deaths were recorded, with most mortality occurring from January through April when gray wolf predation was an important mortality source for all cohorts.			
73	Nelson, Michael E., Mech, L. David	1986	Deer population in the central Superior National Forest, 1967-1985	VOYA
	This report documents the deer population trend from 1976 through 1985 in a part of the central region of the Superior National Forest and compares the recent trend with past estimates.			

74	Nelson, Charles M., Stevenson, Richard, Mitchell, Andrew, Lutz, Bret, Wallace, Brenda, Aurino, Anthony, Stoppel, Mark, Ackerman, Kim	1986	Profile of 1985 deer hunters on North Manitou Island	SLBE
	The report provides information on hunter perspectives during the 1985 white-tailed deer hunt on North Manitou Island. Goals of the report were to determine how hunters learned about the hunt, estimate the hunting effort, estimate the number of deer seen and harvested per unit of effort, determine the opinions of hunters about regulations, discover factors leading to hunter satisfaction and dissatisfaction, provide hunter demographics, and determine why some permitees did not hunt and whether they intended to hunt the next season.			
75	Newman, Alexandra	2000	Lakeshore deer survey results released without much comment; Chesterton tribune	INDU
	The article discusses the findings of the March 23, 2000 aerial, infrared deer survey conducted at Indiana Dunes National Lakeshore, Indiana Dunes State Park, and Beverly Shores, IN. The white-tailed deer population in the area has been controversial in the past, and the survey was conducted to determine the number of deer in the area and to describe some of the population's seasonal movements.			
76	Norton, Mike	1985	Deer limit may triple on Manitou; Traverse City record-eagle	SLBE
	The article discusses the history of the white-tailed deer population on North Manitou Island. The purpose of commencing a special hunt on the island is also discussed.			
77	Oastler, Frank R.	1929	A survey of Isle Royale - Lake Superior Survey for the National Park Service	ISRO
	Copy in Detroit News collection, Michigan historical Collections, Ann Arbor. Citation found in "Woodland caribou restoration at Isle Royale National Park - a feasibility study" by Jean Fitts Cochrane, September 1996. Survey to determine whether island met national park standards. Jean Cochrane's notes on this survey mention that on page 8 speaks of caribou, white-tail deer, moose, marten, and coyotes. A photocopy of a portion of this report is found in the Park Archives (Cabinet 3, Drawer C, folder titled "Information on Bill Lively"). Pages 1, 2, 3, and 8 are all that is available.			
78	Olexa, Edward M., Gogan, Peter J.P.	1991	White-tailed deer pellet group census at Voyageurs National Park, Spring 1991	VOYA
	In 1989, K. Kozie established and sampled a system of white-tailed deer pellet group plots. This report presents the results of the spring 1991 pellet group count and compares them to results in 1989.			
79	Ozoga, John J.	1968	Variations in microclimate in a conifer swamp deeryard in northern Michigan; Journal of Wildlife Management	PIRO
	Coniferous swamps are sought as shelter by white-tailed deer (*Odocoileus virginianus*) during winter deeryarding in Alger County, MI. Six habitats within a 40 mi2 conifer swamp at the Cusino Deeryard complex were studied during 1965-66 to determine differences in microclimate. Weather stations were established within 5 types of vegetation which provided food and cover (mature swamp conifers, pole-sized swamp conifers, sapling swamp conifers, mixed hardwood-conifers, and northern hardwoods), and another station was located in an upland opening. Results showing relationship between snow depth and its support quality, in addition to results of the above mentioned weather data, are provided. Complexity of effects of winter weather on deer is addressed. Body heat loss under different types of cover, distance from cover to suitable browse conditions, and the cumulative effects of winter conditions as winter progresses (snow support quality and depth, reduction in volume of browse) are discussed. Vegetation habitats that provide optimal winter deeryard survival are described.			
80	Poparad, Paulene	1999	Committee makes final deer recommendations; News-dispatch	INDU
	The article describes the decisions made during Dunes Region Deer Study Committee meeting on white-tailed deer management in the area contain Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
81	Poparad, Paulene	1999	Ohio park official encourages deer committee; News-dispatch	INDU
	The article discusses the goals of the Dunes Region Deer Study Committee. The committee was created to aid in the determination of appropriate white-tailed deer control methods to be used in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			

82	Poparad, Paulene	1999	Deer study group faces crunch time; News-dispatch	INDU
	The article describes the issues covered by the Dunes Area Deer Study Committee in past meetings and those that will be covered in future meetings. The committee was formed to determine which deer control methods would be most appropriate for the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
83	Robinson, William L., Corinth, Russell; Kenner, Brian C.	1997	The status of vegetation and white-tailed deer in Beaver Basin, Pictured Rocks NL (ABSTRACT); Lake Superior National Parks research conference	PIRO
	History of Beaver Basin as a winter deeryard is reviewed. Previous studies examined changes in the white-tailed deer (*Odocoileus virginianus*) populations when commercial feed was provided by private landowners in the 1960's and 1970's and after artificial feeding was terminated. The systematic assessment of browse vegetation of this study is the first in 16 yrs in Beaver Basin and utilizes transects established by Jensen in 1979-1980. In its final form the study will also estimate present populations of deer and assess the possibility that gray wolves (*Canis lupus*) will use Beaver Basin.			
84	Robinson, William L., Fanter, Lloyd H., Spalding, Albert G., Jones, Steven L.	1981	Biological impacts of political mismanagement of white-tailed deer in Pictured Rocks National Lakeshore	PIRO
	A review of the white-tailed deer population (*Odocoileus virginianus*) in Beaver Basin of Pictured Rocks National Lakeshore, MI from 1974 to 1979 includes information about supplemental winter feeding, browse availability, malnutrition, predator species, mortality, and the political activity that delayed and derailed management decisions.			
85	Robinson, William L., Fanter, Lloyd H., Spalding, Albert G., Jones, Steven L., Jensen, William F.	1982	The deer of Beaver Basin: ecology and politics of a man-made irruption	PIRO
	Dynamics of the deer population in Beaver Basin, Pictured Rocks National Lakeshore, MI, are summarized from several studies over the period 1974-80. Population exceeded the carrying capacity of the winter yard due to supplemental feeding in the years prior to the acquisition of Beaver Basin by the National Park Service. Densities, physical condition, and mortality of deer during and after supplemental feeding are described. Data about coyote predation, size of the winter yard, browse analyses, winter severity indices, aggression of deer, and distribution of deer in the summer are also presented. Recalculations produced some changes in the estimates of deer populations from the earlier studies. A history of the local politics that augmented the numbers of deer dying of starvation and the further deteriorization of cedar browse is given. Maps of vegetation types, summer ranges, and winter yard sizes are included.			
86	Robinson, William L., Spalding, Albert G.	1977	A report on deer populations in Beaver Basin, Pictured Rocks National Lakeshore, winter 1976-77	PIRO
	The white-tailed deer (*Odocoileus virginianus*) population was studied in Beaver Basin of Pictured Rocks National Lakeshore, MI following years of supplemental winter feeding. Deer movement was monitored and estimates of their numbers were made using self-attaching collars and live-trapping. Mortality numbers were estimated by systematic searches, random encounters, following up on reports made by other people, and investigating predator and scavenger activities. The jaw and femur were taken, when possible, to determine the age of the deceased deer and the fat content of the bone marrow (an indication of general physical condition). Data on browse availability and utilization from 57 plots are presented. Lincoln Index and Schnabel calculations were used to estimate a deer population of 443, a decline from 651 during the winter of 1975-76. A winter severity index is provided. Maps depict population densities at intervals from January through April 1977, locations of dead deer, and deer movement.			
87	Rogers, Lynn L., Mech, L.David, Dawson, Deanna K., Peek, James M., Korb, Mark	1980	Deer distribution in relation to wolf pack territory edges; Journal of Wildlife Management	VOYA
	Studies conducted in the Superior National Forest in Northeastern Minnesota show that densities of white-tailed deer are higher in areas of overlap between territories of wolf packs than in territory centers.			
88	Rowe, Rick J.	1978	The incidence of *Parelaphostrongylus tenuis* and other helminth parasites in cervids of Voyageurs National Park 1977-1978	VOYA
	The incidence of *Parelaphostrongylus tenuis* and other helminth parasitism was studied in white-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*) during 1977 and 1978. The results presented in this report are based on the analysis of 382 deer and 16 moose pellet samples collected by Voyageurs National Park officials. Organisms, other than *P. tenius* and other helminths, detected during analysis were rotifers and tardigrades. A reference collection of permanently mounted slides containing samples of all species observed during analysis was prepared for future use.			

89	Schelling, Lee	2000	Aerial survey shows 444 deer in dunes National Lakeshore; News-dispatch	INDU
	The article discusses the results of the March 23, 2000 aerial, infrared deer survey at Indiana Dunes National Lakeshore. Some citizens in the nearby community of Beverly Shores, IN feel that the white-tailed deer population is too high, and are considering various management tactics to reduce their numbers including special hunts and contraceptives.			
90	St. Croix National Scenic Riverway	1989	Deer aging - 1989	SACN
	This one page document contains information on five animals taken along the lower section of the St. Croix river. Date, sex, age, points, location hunted and checked are included.			
91	Stoll, Albert Jr.	1926	Isle Royale: an unspoiled and little known wonderland of the north; American Forests	ISRO
	A brief introduction to Isle Royale. The paragraphs on fauna include caribou, moose, Virginia white-tailed deer, sharp-tailed grouse, and fox.			
92	Stromberg, Burt, Laursen, Jeffrey	1990	Liver flukes in deer	SACN
	Objectives of the study are to determine distribution of liver flukes in Minnesota and how to better control them. Research conducted on animals taken in deer hunt at St. Croix State Park and at Fort Ripley during the past 8-9 years. Control of liver flukes is a concern due to spread to cattle, sheep and goats in same area.			
93	U.S. Forest Service, Rogers, Lynn L.	1987	Seasonal changes in defecation rates of free-ranging white-tailed deer; Journal of Wildlife Management	VOYA
	Defecation rates of 7 free-ranging white-tailed deer were studied in a coniferous-deciduous forest in northeastern Minnesota in order to determine any seasonal changes in the numbers of pellet groups deposited per day.			
94	Urbanik, Vicki	1999	Marathon meeting fails to find consensus on deer controls; Chesterton tribune	INDU
	The article discusses some of the controversy encountered during the Dunes Region Deer Study Committee's final meeting in August 1999. The committee was attempting to reach consensus on white-tailed deer control methods to be used in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
95	Urbanik, Vicki	1999	Deer panel favors feeding bans, opposes trapping and relocation; Chesterton tribune	INDU
	The article describes the white-tailed deer control possibilities discussed by the Dunes Region Deer Study Committee. The committee was formed to determine the preferred forms of deer control methods to be used in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
96	Urbanik, Vicki	1999	Deer panel debates counting deer before killing them; Chesterton tribune	INDU
	The article describes a debate that occurred among the Dunes Region Deer Study Committee on whether or not it would be necessary to conduct a white-tailed deer survey prior to utilizing control methods. While some committee members felt it was important to determine the number of deer in the area of interest, others thought that proving that deer populations were damaging the vegetation in the area was enough information to begin management. The committee was created to determine which deer control methods would be most appropriate for the area including Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
97	Urbanik, Vicki	1999	Purdue biologist defends deer kill; Chesterton tribune	INDU
	The article describes the Dunes Area Deer Study Committee's meeting with Purdue University biologist, Dr. George Parker. Dr. Parker discussed the deer control plan that he thought would be most effective in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres. Future white-tailed deer research and management plans at the Lakeshore are also mentioned.			
98	various compilers	no date	Aerial deer census maps; Aerial deer census maps	INDU
	This series of maps represents the efforts of various biologists to record the number and location of white-tailed deer seen during aerial surveys between 1988 and 1993 at the National Lakeshore.			

99	various compilers	no date	N1427 White-tailed deer - North Manitou Island; natural and social sciences files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with white-tailed deer (*Odocoileus virginianus*) on North Manitou Island, Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: a Michigan Department of Natural Resources/National Park Service management proposal for the white-tailed deer of North Manitou Island; data sheets (physical data, census data, demographics); deer hunt statistics, a report by David Case and Dale McCollough titled "The White-Tailed Deer of North Manitou Island, Michigan"; and, management/research proposals.			
100	various compilers	no date	N1427 Mammals; natural and social sciences files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with the observations and research mammals in Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: white-tailed deer (*Odocoileus virginianus*) on North and South Manitou Islands (management plans, population survey data); collection permits; research proposals; and, firearm deer season results.			
101	various compilers	no date	N14 Animal/plant life - observation/study; Natural and Social Sciences Files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with the observations and research of plants and animals in Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: gypsy moths (trapping data); North Manitou Island white-tailed deer (winter count data, hunting data,); Michigan monkey flower (*Mimulus glabratus var. michiganensis*); exotic species (management); new or rare wildlife sightings; pitcher's thistle (*Cirsium pitcheri*); collection permits (plants and/or animals); a report by Brian Hazlett ("Reconnaissance Report on the Vegetation of the Coastal Dunes East of Platte River Point"); and, a report by Michael Lloyd Scott ("Growth Dynamics and Successional Trends in an Old-Growth, Cedar-Hardwood Forest").			
102	various compilers	no date	N14 North Manitou deer hunt; Natural and Social Sciences Files	SLBE
	A chronological record (everything has been dated) of documents (memos, correspondence, reports, research proposals etc.) dealing with white-tailed deer (*Odocoileus virginianus*) on North Manitou Island, Sleeping Bear Dunes National Lakeshore, Michigan. This file contains information concerning: the results of the North Manitou Island Deer Hunt; census reports; and, management recommendations.			
103	Verme, Louis J.	1965	Swamp conifer deeryards in Northern Michigan, their ecology and management; Journal of Forestry	PIRO
	Factors influencing the choice of winter deeryard habitats by white-tailed deer (*Odocoileus virginianus*) in Alger Co., MI are: snow pack, temperature, wind, and nutrition. The study area encompassed 40 mi2 and included 5 types of habitats: 1) sparse swamp conifers and hardwood poles, 2) dense mature, swamp conifers of even-age, 3) moderately dense, pole-sized swamp conifers of even-age, 4) moderately sparse swamp conifer saplings, and 5) a clear-cut, open area. Soil conditions and more thorough description of woody vegetation is provided. Seven weather stations provided data on snowfall, snow pack, wind speed, and temperature from mid January to early April, 1957. Minimum daily temperatures and snow pack depths from 5 habitats were graphed to illustrate the value of canopy closure in providing shelter for deer. Ages of even-aged, swamp conifer stands were correlated to relative shelter value, relative browse production, and relative snow depth. Observations suggest that protection provided by cover (shelter) from winter weather is more influential in determining where deer congregate than is the quantity and quality of browse.			
104	Verme, Louis J., Ozoga, John J.	1971	Influence of winter weather on white-tailed deer in Upper Michigan	PIRO
	Response of white-tailed deer in winter deeryards to weather conditions was studied near Shingleton, Alger Co., in the Upper Peninsula of Michigan. "Chillometer" and "compaction gauge" were designed and used at the stations to measure atmospheric chill and snow compaction (the supporting quality of the snow). Weekly severity indices (measure of relative winter stress on deer) were compiled by combining the 2 measurements. A cumulative total for 5 mo. constituted a winter severity index. In addition, activity patterns of deer were studied during the winters of 1964-65 and 1965-66. Deer movement was monitored with mechanical traffic-counters on well-used runways under dense cover in the deeryards. Modifications to the severity index are presented using a 3 mo. midwinter severity index and one that is a combination of the severity indices of the first and fifth months. Authors conclude that the amount of time spent in the deeryard, which is largely determined by the onset of severe weather and timing of the snowmelt, is of critical importance, particularly to does and their fetuses.			

105	Voyageurs National Park	1985	Winter 1985 aerial moose and deer census, Voyageurs National Park	VOYA
	This in-house report from the Resource Management Specialist to the Terrestrial research Biologist and Park staff presents results of the aerial moose and deer censuses conducted January 10 to February 25, 1985 in Voyageurs National Park. Included is a photocopied map of the sighting locations.			
106	Voyageurs National Park	1992	White-tailed deer aerial surveys, Voyageurs National Park	VOYA
	Printout of Dbase IV database containing information on white-tailed deer sightings during aerial surveys. Includes records from 1989 to 1991. Each record includes date of survey, sighted animals number, sex, age, and habitat. Also contains a note field which describes positions of animals (resting, standing, swimming, etc) or location and in some cases a photonegative number.			
107	Walsh, Steve	1999	Deer survey finds no increase; The Vidette Times	INDU
	The article discusses the results of eight years of white-tailed deer spotlight surveys at Indiana Dunes National Lakeshore. Possible attitudes of local residents are mentioned.			
108	Wetzel, John F., Wambaugh, James R., Peek, James M.	1975	Appraisal of white-tailed deer winter habitats in northeastern Minnesota; Journal of Wildlife Mangement	VOYA
	Fall and winter forage preferences and habitat use by white-tailed deer were determined to estimate forage production and utilization in important wintering areas in the Superior National Forest.			
109	Zorn, Tim	1999	Lakeshore spotlights deer herd; Post-tribune	INDU
	The article discusses the methods used to monitor deer at Indiana Dunes National Lakeshore and the results derived since 1991. White-tailed deer management in nearby state and private lands is described, and possibilities for future deer management at Indiana Dunes National Lakeshore are also mentioned.			
110	Zorn, Tim	2000	Aerial survey shows 444 deer in area; Post-tribune	INDU
	The article discusses the results of the March 23, 2000 aerial, infrared deer survey at Indiana Dunes National Lakeshore. While no deer reduction programs were planned to take place, the park staff had begun to protect rare plants and trees within the Lakeshore boundaries. Beverly Shores, IN, where the highest deer population occurred during the survey, was considering implementing a deer contraception program.			
111	Zorn, Tim	1999	Committee divided on deer issue; Post tribune	INDU
	The article discusses the controversy encountered during a Dunes Region Deer Study Committee meeting. The committee was created to determine the most favorable white-tailed deer control techniques that could be used in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
112	Zorn, Tim	1999	Deer debate produces surprising consensus; Post tribune	INDU
	The article describes the white-tailed deer control methods discussed by the Dunes Region Deer Study Committee. The committee was formed to help the Indiana Department of Natural Resources and surrounding communities and agencies decide how to manage deer populations in the area containing Indiana Dunes National Lakeshore, Indiana Dunes State Park, Beverly Shores, and Dune Acres.			
FOX				
1	Isle Royale National Park	no date	Fox management	ISRO
	The document summarizes problems association with the habituation of red fox (*Vulpes vulpes*) to human presence on Isle Royale National Park. Recommendations are made for management of fox behavioral problems.			
2	Johnson, Wendel John	1969	Food habits of the Isle Royale red fox and population aspects of three of its principal prey species	ISRO
	The primary objectives of this study were to determine: (1) the food habits of the red fox, *Vulpes vulpes* ; (2) population characteristics of three of the fox's principal prey - the snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus husdsonicus*), and deermouse (*Peromyscus maniculatus*); and (3) habitat preferences of the prey species. Snowshoe hares were the primary prey item found in red fox scats throughout the year except in late summer when fruits predominated. Moose carrion is an important winter food provided by wolves. Muskrats, red squirrels, deer mice and birds served as secondary prey chiefly after snow cover was gone. For each of the three prey species discussed, information is presented on sex ratios and age structures, reproductive biology, predation and disease, survival rates and longevity, movements and territoriality, population densities, habitat preferences, biomass, and food and feeding habits. Appendix A carries an annotated checklist of the mammals recorded from Isle Royale.			

3	Johnson, Wendel John	1970	Food habits of the red fox in Isle Royale National Park, Lake Superior; The American Midland Naturalist	ISRO
	The food habits of the red fox (*Vulpes vulpes*) in Isle Royale National Park were investigated both for seasonal and annual trends, over a 3-year period, 1966-68, by analysis of 448 scats. Mammals were the most important group of prey species. Snowshoe hare (*Lepus americanus*) had the highest percent of total occurrence and was especially important during the winter months. Foxes forage almost entirely on fruits in August and September. The lack of prey diversity and its effect are discussed.			
4	Nelson-Jameson, Barbara	1990	Red fox integrated pest management plan: Isle Royale National Park	ISRO
	This is a management plan for dealing with red fox (*Vulpes vulpes*) habituated to human presence and/or artificial feeding in Isle Royale National Park. The plan includes action threshold levels, management alternatives and recommendations, and information on record keeping and evaluation.			
5	Patton, Stephen, R.	1979	Short and long term effects of red fox nocturnal predation on the nesting success of colonial breeding herring and ring-billed gulls	SLBE
	On South Manitou Island, Sleeping Bear Dunes National Lakeshore red fox (*Vulpes vulpes*) predation on herring (*Larus argentatus*) and ring-billed (*Larus delawarensis*) colonies was monitored to determine: the effect of foxes on adult gull mortality rates and reproductive success; the mechanisms by which foxes affected these rates; the long term effect of predation on the status of these colonies; and, the overall effectiveness and efficiency of the methods used by the National Park Service to alleviate fox predation at the study colonies. Colonies were censused to determine population size, clutch size, hatching rates and fledging rates. Daily records were kept regarding disturbances within the colonies and the loss of eggs and chicks. The pattern and frequency of fox activity at the colonies and the response of gulls to foxes were recorded.			
6	Shugart, Gary, W.	1977	Resident red fox predation upon an island gull colony; Jack-pine Warbler	SLBE
	On South Manitou Island, Sleeping Bear Dunes National Lakeshore a large gull colony exists despite the presence of a red fox (*Vulpes vulpes*) population introduced in 1948. Human and predator disturbances were monitored during the 1972-1974 breeding season with the major emphasis on determining the extent of the fox predation. Predation and disturbance was determined to have a negative effect on the nesting success of herring gulls (*Larsus argentatus*) and to a lesser extent on the nesting success of ring-billed gulls (*Larsus delawarensis*). Predator-induced egg and chick abandonment and the surplus killing of adults and young were determined to be the major causes of reduced nesting success. The fox population was controlled by humans from 1953 to 1969, which probably saved the gull colony.			
7	Southern, William, E.	1976	Management strategies for reducing predator-caused mortality in the South Manitou Island gull colonies, Sleeping Bear Dunes National Lakeshore	SLBE
	Management strategies and proposals to preserve the herring (Larus argentatus) and ring-billed (*Larus delawarensis*) gull colonies on South Manitou Island, Sleeping Bear Dunes National Lakeshore are presented. Sections pertaining to: colony descriptions, census details and clutch size, intracolony disturbances and mortality, red fox (*Vulpes vulpes*) deterrent programs, and procedures for managing and monitoring the Manitou colonies. There is a 20 page appendix titled "The Influence of Fox Predation on Ring-billed and Herring Gull Nesting Success." Over a 2 year period nests were censused to determine clutch sizes and hatching rates, monitor rates of adult and chick mortality, and determine the primary causes of diurnal and nocturnal disturbances that increased mortality. Red fox predation was found to be the major cause of mortality.			
8	Southern, William, E., Hanners, Lise, A., Patton, Stephen, R.	1978	Monitoring gull reproductive success and induced prey aversion in red foxes - South Manitou Island (interim report)	SLBE
	Part I summarizes the reproductive success of the herring (*Larus argentatus*) and ring-billed (*Larus delawarensis*) gull colony on South Manitou Island, Sleeping Bear National Lakeshore. Colony descriptions, census results and mortality and reproductive rates at the Manitou colonies are discussed. Part II summarizes the effects of several methods to control the predation of gulls by red fox (*Vulpes vulpes*). Hunting, trapping, and conditioning foxes against gull predation using lithium chloride are discussed. There are maps showing the extent of the gull colony.			

9	Stockwell, Jack E., Gannon, John E.	1977	Observations on the winter ecology of red fox (*Vulpes vulpes*) on South Manitou Island, Michigan	SLBE
	Predation of Ring-billed Gulls (*Larus delawarensis*) and Herring Gulls (*Larus argentatus*) on their nesting colonies on South Manitou Island, Sleeping Bear Dunes National Lakeshore, MI, by red fox (*Vulpes vulpes*) was studied during late winter 1976. Standard tracking methods and scat analyses were employed to determine the abundance and winter diet of red fox on South Manitou Island. Habitat, fox-gull interaction, food availability, and population fluctuation are discussed. Maps illustrate the location and vegetation of South Manitou Island. Management implications are discussed.			
10	Wolowiec, Mark E.	1981	Helminth eggs in wolf and fox scats, in soil, and on vegetation from Isle Royale National Park, with special reference to *Echinococcus granulosus*	PIRO
	no abstract available			
CATS				
1	author unknown	no date	Lynx (*Felis lynx*)	INDU
	The report describes the historic distribution and habitat preferences of lynx, a species that has not occurred at Indiana Dunes National Lakeshore since the mid-1800s. Reasons this species can no longer be reintroduced to the area are included.			
2	author unknown	no date	The bobcat (*Felis rufus*)	INDU
	The report describes the current distribution and habitat preferences of the bobcat, a species that was extirpated from northwest Indiana in the early 1880s. Possible threats to the species are discussed, and restoration procedures are included.			
3	Harger, E.M.	1956	The status of the Canada lynx in Michigan; Jack-pine Warbler	ISRO
	no abstract available			
4	Harger, Elsworth	1965	Status of the Canada lynx in Michigan; Jack-pine Warbler	PIRO
	citation only from McCann, Robert, 1975.			
5	Lovallo, Anderson, Mark	1996	Bobcat (*Lynx rufus*) home range size and habitat use in Northwest Wisconsin; American Midland Naturalist	SACN
	Bobcats were radio-tagged and monitored to estimate and compare annual and seasonal patterns in home range size and habitat use in northwestern Wisconsin. Annual and seasonal male home ranges extensively overlapped those of other males and females, whereas females maintained more exclusive areas. Annual male home ranges were 112% larger than those of females. Females expanded and contracted their home ranges seasonally; the largest home ranges occurred in winter. Males shifted similar-sized ranges seasonally resulting in larger annual ranges. Male bobcats selected lowland conifer forests, and avoided upland conifer stands, upland deciduous forest and mixed savanna cover-types. Females exhibited similar preferences but also selected for lowland deciduous forests and avoided unforested areas. Seasonal shifts in habitat use were evident for males and females; both used lowland conifer stands more and unforested areas and upland deciduous forests less in winter. The selection of lowland coniferous forests by males and females during all seasons suggests these areas are important range components in Wisconsin.			
6	Lovallo, Anderson, Mark	1996	Bobcat movements and home ranges relative to roads in Wisconsin; Wildlife Society Bulletin	SACN
	Our data suggests that bobcats in northwestern Wisconsin selected home ranges with relatively higher densities of trails and lower densities of secondary highways. Within established home ranges, bobcats crossed secondary highways, unpaved roads, and trails in proportion to their occurrence and crossed paved roads less than expected. Geographic and behavioral selection appeared to be a function of vehicle traffic levels and juxtaposition of preferred bobcat habitat than roadless areas.			

7	Martin, Christian J.	1988	The history and reestablishment potential of marten, lynx, and woodland caribou on Isle Royale Isle Royale National Park Resource Management Report 88-3	ISRO
	The marten, lynx, and woodland caribou were all present on Isle Royale at the turn of the century but populations of each disappeared shortly thereafter. Lynx and marten were heavily trapped throughout the region during the early 1900s; marten were extirpated around 1905, lynx were extirpated in the 1930s. Historical records suggest that Isle Royale caribou were semi-permanent residents and that individuals often traveled to and from the mainland given favorable ice conditions. A complex set of natural and human-influenced ecological interactions operating on the mainland may therefore have played a primary role in the disappearance of caribou from the island by the late 1920s. The remainder of the paper addresses information to be considered by management as they consider the reestablishment of these species.			
8	St. Croix National Scenic Riverway	1987	North American lynx species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway, from observations made in 1987. The Canada lynx (*Lynx canadensis*) is a very rare species along the Riverway, and is listed as endangered in Wisconsin and threatened in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this mammal (biology, ecology, etc.).			
MOOSE				
1	Ackerman, Timothy N.	1985	1985 summer report: summer activity patterns of moose on Isle Royale National Park	ISRO
	The summer portion of this 2-year project was to determine the summer activity budget of moose *Alces alces* as influenced by thermal constraints, based on the assumption that if increasing heat affects moose their feeding duration will decrease and behavioral adaptations will become evident. Summer observations of moose engaged in feeding activities (aquatic and terrestrial sites), bedding site preferences, ambient temperature, signs of heat stress, and time spent at aquatic sites and mineral licks (both sodium sources) were made to quantify and meet the project objective. Results are also compared to winter observations of Isle Royale moose.			
2	Ackerman, Timothy N.	1987	Moose response to summer heat on Isle Royale	ISRO
	Activity time shares and behavioral and physiological responses of moose (*Alces alces*) in Isle Royale National Park were analyzed in relation to thermal environment. Moose feeding and bedding activities were observed during daylight hours while environmental temperatures were measured. Also, certain physical characteristics of habitats selected by moose were recorded with the corresponding temperatures. It was found that black globe temperatures above 15 degrees centigrade were associated with decreased foraging activity and increased inactivity, while black globe temperatures above 30 degrees centigrade elicited overt responses of heat avoidance that were associated with dramatic increases in metabolism. Heat avoidance is characterized by standing rumination, panting, and bedding in water. By reducing forage intake and increasing energy expenditure in summer, a period of caloric storage high summer temperatures potentially contribute to over winter mortality and may limit the southern distribution of moose.			
3	Aho, Robert W.	1978	Ecological relationship of moose, aquatic plants, and sodium on Isle Royale National Park, Lake Superior	ISRO
	The study showed the importance of sodium contained in aquatic plants browsed by moose to the diet and nutrition of moose. Moose tended to select plants higher in sodium; therefore, concentrated feeding in areas where plants exhibited higher sodium concentrations.			
4	Aho, Robert W., Jordan, Peter, A., Linn, Robert M.	1979	Production of aquatic macrophytes and its utilization by moose on Isle Royale National Park; Proceedings of the 1st conference on scientific research in the National Parks; Transactions and proceedings series	ISRO
	This paper presents estimates of production of aquatic macrophytes (and their associated sodium production) and its utilization by moose based on exclosure experiments. It discusses the implications of current removal rates with respect to future productivity of aquatics and to the potential limitation of the moose population because of declining sodium availability.			

5	Aho, Robert W., Jordan, Peter A.	no date	Ecological studies of moose foraging at Isle Royale National Park with primary emphasis on aquatic feeding and sodium dynamics	ISRO
	Aquatic food resources of moose on Isle Royale National Park were studied in order to further clarify the role of aquatics in the sodium nutrition of moose and to preliminarily test whether aquatics constitute a limiting factor. The objectives of this study were to document: 1) the distribution, production, species composition, and the sodium levels of aquatics, 2) their utilization by moose, and 3) the impact of moose grazing on subsequent aquatic productivity. When combined with moose population data, this information permits a preliminary test of whether aquatic food resources comprise a limiting factor. These objectives were approached at two levels, an intensive study that incorporated moose-proof exclosures in two beaver pond systems on western Isle Royale, and an extensive, island-wide survey of aquatic habitats, standing crop of aquatics, and sodium levels.			
6	Aldous, Shaler E., Krefting, Laurits W.	1945	Daily Notes on trip to Isle Royale National Park for Moose Browse Survey, May 5 to 27, 1945	ISRO
	no abstract available			
7	Aldous, Shaler E., Krefting, Laurits W.	1946	The present status of moose on Isle Royale; Transactions of the North American wildlife conference	ISRO
	The research describes the reduction of the moose herd from an over-population during the early 1930s to a small remnant in 1936 and subsequent growth. It also details food habits of the moose and food availability by species from plot data located at several points on the island. Detailed data on availability and utilization of 28 forage plants are provided.			
8	Allen, A.W., Jordan, P.A., Terrell, J.W.	1987	Habitat suitability index models: moose, Lake Superior Region	VOYA
	This document presents models developed for evaluation of moose (*Alces alces*) habitat quality in the Lake Superior region. The models have been designed to facilitate their application where timber and wildlife management actions are being coordinated in integrated resource planning. The models can be used to both identify impacts to moose habitat and identify measures to enhance habitat quality. Model I is structured on evaluations of the abundance and quality of growing and dormant-season food and cover. Model II is based on an evaluation of cover type composition and its assumed relationship to moose habitat suitability in the region of model applicability.			
9	Allen, Arthur W., Terrell, James W., Mangus, Warren L., Lindquist, Edward L.	1991	Application and partial validation of a habitat model for moose in the Lake Superior region	VOYA
	A modified version of the dormant-season portion of a Habitat Suitability Index (HSI) model developed for assessing moose (*Alces alces*) habitat in the Lake Superior region was incorporated in a GIS for 490 km2 of Minnesota's Superior National Forest. Moose locations (n=235) were plotted during aerial surveys conducted in Dec. 1988 and Jan. 1990-91. Dormant-season forage and cover quality for 1000m, 500m, and 200m radii plots around random points and moose locations were compared using US Forest Service stand examination data. Cover quality indices were lower than forage quality indices within all plots. The median value for the average quality index was greater (P=0.003) within 200m plots around cow moose locations than for plots around random points for the most severe winter of the study. The proportion of highest-quality winter cover was greater within 500m and 200m plots around cow moose than within similar plots around random points during the two most severe winters. Results indicate that suboptimum ratings of winter habitat quality used in the GIS for dormant-season forage >100m from cover, as suggested in the original HSI model, are reasonable.			
10	Allen, Durward L.	1962	Review and prospectus of wildlife studies on Isle Royale	ISRO
	This is a brief summary of the purposes, organization, and plans for the program of graduate studies on the wolf, moose, beaver, and other major wildlife species on Isle Royale. Pages 3 and 4 present findings after the first two seasons of study. The most significant findings of this time period were concerned with the moose-wolf relationships; wolf predation appears to favor calves and moose 9 to 10 years old (half of this group shows some sort of disability or disease). The report also presents findings on moose and wolf population sizes, beaver studies, and fox and snowshoe hare.			
11	Allen, Durward L.	1964	Isle Royale: predator vs prey; Field and stream	ISRO
	The article describes research by two Purdue University graduate students at Isle Royale. From 1958 to 1961, L. David Mech concentrated on the behavior of the wolves and their effects on the moose herd. From 1960 to 1963, Philip C. Shelton studied beaver to find out how they reacted to starvation and predation.			
12	Allen, Durward L.	1969	Environmental coactions of the moose (*Alces alces*) in a wolf-dominated island community (Isle Royale, Michigan); National Geographic Society Research Report, 1964 Projects	ISRO
	no abstract available			

13	Allen, Durward L.	1974	Of fire, moose, and wolves; Audubon	ISRO
	The article discusses the early history of the wolf and moose populations on Isle Royale National Park including the effect of the 1936 fire that burned over one quarter of the island. It also discusses how winter snow depth affects moose in their browsing habits and locations and how a winter of deep snow affects the age of moose-winter kill by the wolves. The value of long term ecological studies is also described.			
14	Allen, Durward L.	1976	The worth of wilderness: With interpretations from a study of wolves and moose on Isle Royale; Research in the parks: Transactions of the National Park centennial symposium; Transactions and Proceedings (Symposium) Series	ISRO
	Examines the values of wilderness and the connotations and applications of thirteen years of scientific research at Isle Royale National Park. The purpose of this examination is to illustrate the purpose of wilderness research in adding to the fundament of biological knowledge and to the factual base of management in the National Park Service.			
15	Allen, Durward L., Mech, L. David	1963	Wolves versus moose in Isle Royale; National geographic	ISRO
	The article includes a popular account with numerous color photos describing the winter studies of the wolf-moose research program. The emphasis is on the techniques used in the study and some general descriptions of what has been learned from studies during 1958-1961.			
16	Allen, Durward L., Peterson, Rolf O., Dietz, James M.	1971	A summary of field work on Isle Royale, May-September, 1971	ISRO
	The work during the summer of 1971 emphasized extensive coverage of the island, including as much off-the-trail hiking as possible in order to locate fresh wolf sign and to record moose observations without excessive repetition. Efforts were made to cover known winter and summer travel routes of the wolves. All moose carcasses found during these travels were examined, with appropriate specimens collected as in past years. Notes were taken on beaver, snowshoe hare, birds (including three first nesting records for ISRO) and other wildlife as they were encountered.			
17	anonymous	1961	John Preston's Moose Story; American Forests	ISRO
	no abstract available			
18	author unknown	1973	Analysis of the Isle Royale ecosystem: Measurement and simulation of the flow of energy and nutrients among the soil, vegetation, moose, and wolves	ISRO
	The document is a research proposal submitted to the National Science Foundation to gain an understanding of the basic ecosystem properties essential for understanding and managing terrestrial communities through long-term study of energy flow, mineral cycling and population dynamics. Research includes the study of soils, vegetation production and mineral recycling in aquatic habitats and an extensive survey of the forests of the entire island. Proposed field work on 1) measurement of total biomass and net primary productivity of forest vegetation, and the utilization of this vegetation by moose and insects, 2) intensive study in aquatic habitats of primary production and moose herbivory, 3) measurement of meteorological inputs and outflows of water and minerals, 4) continued monitoring of moose numbers and activity patterns is also described.			
19	author unknown	1982	Position paper on the Isle Royale moose-wolf program	ISRO
	The document summarizes the current situation in the moose-wolf research program especially where park management has impacts on the wolf population. It also addresses the scientific merit of the study and presents areas where additional research could be done. Funding is also addressed in this paper, and there is a recommendation that WASO take over some of the funding responsibility. Penciled editorial comments exist in the margins of this copy. In this same file is a memo from Isle Royale National Park Acting Superintendent Stu Croll to the Midwest Regional Director listing specific comments on the position paper.			
20	author unknown	1982	Wolf-moose monitoring and research program, discussion paper, Isle Royale National Park	ISRO
	The report presents management and scientific objectives regarding the wolf/moose monitoring program on Isle Royale. Methods of study and an estimated budget are also presented.			

21	Bada, J.L., Peterson, R.O., Schimmelmann, A., Hedges, R.E.M.	1990	Moose teeth as monitors of environmental isotopic parameters; Oecologia	ISRO
	The radiocarbon activities of amino acids isolated from crown first molar dentin of moose born between 1948 and 1984 on Isle Royale closely follows the bomb radiocarbon signal generated from atmospheric nuclear weapons testing. This demonstrates that these amino acids are metabolically inert and have recorded the isotopic parameters of the environment during the first year or two of the animal's life. The moose teeth amino acids provide both carbon and nitrogen isotopic chronologies for ISRO for a period of nearly four decades. The carbon isotopic record reflects both anthropogenic alterations of the global atmospheric carbon cycle (the "Seuss" effect), and changes in forest ecology and moose feeding habitat. The nitrogen isotopic chronology is more variable than the carbon record and is the result of environmental and biological factors which are poorly understood.			
22	Barrett, S.A.	1926	Filming moose on Isle Royal (sic). IN: Barrett, S.A. and I. Edwards, editors. Year book of the public museum of the city of Milwaukee 1924, Volume 6(1926):197	ISRO
	Recounts the author’s adventures in filming moose on Isle Royale near McCargo Cove in 1924.			
23	Bedard, J., Telfer, E.S., Peek, J., Lent, P.C., Wolfe, M.L., Simkin, D.W., Ritcey, R.W.	1974	Alces; moose ecology, Ecologie de L'original	ISRO
	no abstract available			
24	Belovsky, Gary E.	1978	Diet optimization in a generalist herbivore: the moose; Theoretical Population Biology	ISRO
	A linear programming optimization model was constructed to describe moose feeding in summer. The model predicts the amounts of aquatic vegetation, deciduous leaves, and forbs a moose should consume each day; and to determine whether or not its feeding is constrained by the maximum feeding time available each day, its daily rumen processing capacity, its sodium requirements, and its energy metabolism. The model can be solved for two alternative strategies: time minimization and energy maximization. The energy-maximizing strategy appears to predict the observed diet chosen by an average moose very well. Also, the diets selected by moose of each sex and various reproductive states appear to fit the energy-maximizing strategy. Furthermore, there appears to be an optimum adult body size for feeding. The general conclusion arrived at is that the foraging of a generalist herbivore can be predicted in a quantitative manner, at least in this case, as has been shown for other types of consumers (carnivores and granivores).			
25	Belovsky, Gary E.	1981	Optimal activity times and habitat choice of moose; Oecologia	ISRO
	no abstract available			
26	Belovsky, Gary E.	1981	A possible population response of moose to sodium availability; Journal of Mammalogy	ISRO
	no abstract available			
27	Belovsky, Gary E.	1981	Food plant selection by a generalist herbivore: the moose; Ecology	ISRO
	no abstract available			
28	Belovsky, Gary E., Jordan, Peter A.	1981	Sodium dynamics and adaptations of a moose population; Journal of Mammalogy	ISRO
	A "balance sheet" for sodium losses and intakes was developed for moose (*Alces alces*) at Isle Royale National Park. This technique emphasized potential time of the year and avenues of sodium loss that might be limiting. A mechanism for sodium storage was proposed which involves the replacement of sodium in the salivary-rumen fluids with potassium during periods of sodium deficiency.			
29	Belovsky, Gary E., Jordan, Peter A.	1978	The time-energy budget of a moose; Theoretical Population Biology	ISRO
	As the first step in developing an optimal foraging model for moose (Belovsky 1978), a time-energy budget for a moose was developed. For the summer period (late May through early September) at Isle Royale National Park, Michigan, we made various behavioral observations on feeding moose and inventoried their food resources. Employing these various sets of data, we were able to determine the quantity of each food consumed by moose, the time required to acquire the foods, preferences for different food plants, and differences demonstrated by the sexes. In addition to this information, we collected data on the moose's ability to utilize each of the forage plants and the population densities of moose in different years (1972-1974) in two forest types. This enabled us to examine energy flow within each of the populations and determine in what manner energy limits the moose population.			

30	Belovsky, Gary E., Jordan, Peter A., Botkin, Daniel B.	1973	Summer browsing by moose in relation to preference, and animal density: a new quantitative approach; IN: Proceedings of the North American Moose Conference and Workshop, 9:101-122	ISRO
	Authors measured the summer diet of moose in two study areas at Isle Royale, by counting recently browsed stems, inventorying the numbers of plants fed upon, and estimating intake rate from direct observation of feeding animals. Applying these techniques in two study-area forest types, they found that among species important as summer browse, *Sorbus americana* and *Acer spicatum* , were preferred over *Betula alleghaniensis* and *B. papyrifera* ; this was based on relative frequency in the diet compared to relative availability. Current browsing pressure upon the plants appears responsible for a trend of decline in the abundance of preferred species.			
31	Berger, A. K.	1934	The Isle Royale moose herd; Natural History	ISRO
	no abstract available			
32	Bergerud, Arthur T., Wyett, W., Snider, B.	1983	The role of wolf predation in limiting a moose population; Journal of Wildlife Management	ISRO
	Moose (*Alces alces*) and gray wolf (*Canis lupus*) populations in Pukaskwa National Park, Ontario, were surveyed annually from 1975 to 1979. Annual Population estimates were made. Wolf predation appeared to be limiting the increase of the Pukaskwa moose population. A model is presented to explain differences in the density of moose between areas based on the availability of escape habitat and the requisite space to increase the searching time for predators and the escape tactics of moose.			
33	Bergstrom, R., Danell, K.	1987	Effects of simulated winter browsing by moose on morphology and biomass of two browse species; Journal of Ecology	ISRO
	no abstract available			
34	Bergstrom, R., Danell, K.	1995	Effects of simulated summer browsing by moose on leaf and shoot biomass of birch, *Betula pendula* ; Oikos	ISRO
	no abstract available			
35	Blackwell, Ann Lowes	1980	A resource consumption model applied to the Isle Royale vegetation-moose system; Bulletin of the Ecological Society of America (Abstract)	ISRO
	no abstract available			
36	Blackwell, Ann Lowes	1981	Extremes in the resource consumption process: a mathematical model of the irruption of the moose population on Isle Royale; Technical Report No 81-001	ISRO
	This paper describes the development of a mathematical model of the moose-browse interaction on Isle Royale from the time of the establishment of the moose population until the time of arrival of the wolves.			
37	Blackwell, Ann Lowes	1983	Extremes in the resource consumption process: a mathematical model of the irruption of the moose population on Isle Royale Part 1 - ecological background and model development; Ecological Modeling	ISRO
	The development of a mathematical model of the moose-browse interaction on Isle Royale, Michigan, from the time of the establishment of the moose population in the early 1900s until the time of the arrival of wolves on the island about the mid-twentieth century is described. A brief history of the observations that were made during that period of the dynamics of the moose population and its resulting impact upon the vegetation is given. The simplifying assumptions that were made, the processes that were judged important enough to be represented in the model, the state variables that were selected and the input variables that were considered are delineated. A rationale is developed for the mathematical form of each of the terms used in the state equations. The literature that was utilized and the methodologies that were employed to obtain estimates of the parameters of the equations and the values of the initial conditions of the state variables are described.			
38	Botkin, Daniel B., Levantin, R. E.	1977	Wolves, moose, and trees: an age-specific trophic-level model of Isle Royale National Park; IBM Research Division, Life Sciences 6834 (#29316)	ISRO
	no abstract available			

39	Botkin, Daniel B., Jordan, Peter A., Dominski, Anthony S., Lowendorf, Henry S., Hutchinson, G.E.	1973	Sodium dynamics in a northern ecosystem (moose/wolves/plants); Proceedings of the National Academy of Science	ISRO
	Analyses of terrestrial sources of sodium and estimates of the sodium requirement of moose (*Alces alces*) on Isle Royale, Lake Superior, suggest that availability of the element controls the moose population. The terrestrial vegetation is very poor in the element, but, as elsewhere, submerged and floating leaved water-plants are relatively rich. Consumption of such plants in summer would provide an adequate source, if the animal can store the element. The fairly high sodium contents of freshwater vegetation have been little appreciated. In general, sodium concentration in water-plants, unlike that of potassium, is not correlated with chloride but the latter is ordinarily in excess of the sodium, so that uptake of the latter implies an equivalent supply of NaCl.			
40	Brandner, Thomas A.	1986	Density-dependent effects of moose herbivory on balsam fir in Isle Royale National Park, Michigan	ISRO
	In Isle Royale National Park, height structure and growth rates of balsam fir (*Abies balsamea*) were analyzed to assess the foraging impact of moose (*Alces alces*) in relation to population density of both fir and moose. Moose impact on fir varied directly with increasing moose density and inversely with increasing fir density. The northeast end of Isle Royale, which contains poor soils, the more abundant fir demonstrated a substantial release in height growth since a decline in the moose population during the late 1970s. On the southwest half of the island, where deeper soils and warmer microclimates permit more abundant deciduous forage, repeated terminal browsing of fir by moose resulted in mean sapling heights of less than one meter in all areas sampled. Given the limited lifespan of severely browsed fir saplings and the eventual loss of canopy fir trees due to age and windfall, it is probable that balsam fir will eventually be virtually eliminated in areas unprotected from moose browsing on the southwestern end of Isle Royale.			
41	Brandner, Thomas A., Peterson, Rolf O., Risenhoover, Kenneth L.	1990	Balsam fir on Isle Royale: effects of moose herbivory and population density; Ecology	ISRO
	Balsam fir (*Abies balsamea*) population parameters were analyzed in Isle Royale to assess moose (*Alces alces andersoni*) herbivory in relation to the population density of both fir and moose. In general, moose suppression of fir height growth and recruitment to the canopy increased with increasing moose density and increasing fir density. Where fir densities were low, sapling heights were restricted regardless of moose density. In such sites, sapling growth suppression has been continuous since a peak in the moose population in the late 1920s. Canopy fir trees at most sites established prior to arrival of moose on ISRO around 1910. At high fir density release from growth inhibition was common following a period of low moose numbers from the mid-1970s to early 1980s. Here this release should facilitate recruitment of fir and effect replacement of canopy losses due to senescence. In other areas, however, continuing canopy losses and lack of recruitment due to intensive herbivory by moose will greatly reduce the fir component of the canopy, effectively preventing any return to the fir-dominated forests of the past.			
42	Cahalane, Victor H.	1946	Moose and beaver, Isle Royale National Park, memorandum to Mr. Drury, Director of NPS	ISRO
	Addresses the issue concerning the overpopulation of moose and beaver on Isle Royale in 1946 and if any intervention should take place.			
43	Cain, Stanley A.	1962	Memorandum on the moose population of Isle Royale National Park	ISRO
	A report on the current status of the moose population on Isle Royale and the condition of the browse for the present population. The author concluded that in the summer of 1962 there appeared to be enough browse for the present population of moose, but the vegetation could not support in health a larger moose population.			
44	Carre, B.	1994	1994 Grand Portage aerial moose survey	GRPO
	no abstract available			
45	Cleland, Charles E.	1963	Analysis of the fauna of the Indian Point site on Isle Royale in Lake Superior. IN: Bastian, Tyler. 1963 archeological survey of Isle Royale National Park, Michigan, 1960-1962. Museum of Anthropology, University of Michigan: Ann Arbor 380 p	ISRO
	Analysis of a primarily Middle Woodland site found large mammals such as caribou and moose, small mammals such as beaver, muskrat and hare, and fish, bird, and turtle. The identification of moose is of particular interest, given the documented historic migration of moose to the island in the early 1900s.			

46	Cleland, Charles E.	1968	Analysis of the fauna of the Indian Point site on Isle Royale in Lake Superior; Michigan Archaeologist	ISRO
	Indian Point is near the entrance to McCargoe Cove. Faunal remains include beaver, caribou, moose, turtle, bald eagle, muskrat, lynx, and fish species.			
47	Coady, J.W.	1974	Influence of snow on behavior of moose; Naturaliste Canadien	ISRO
	no abstract available			
48	Coburn, Donald R.	1934	Report on Isle Royale moose autopsies	ISRO
	Typed report of autopsies on eight moose between April 22 and May 5, 1934.			
49	Cochrane, Jean Fitts	1991	Letter to Rolf Peterson, Michigan Technological University	ISRO
	This letter is a response to Dr. Peterson's letter of 5-16-91 expressing concerns about the potential introduction of new diseases to the Isle Royale moose population if woodland caribou are restored to the island. Of primary concern is the introduction of the parasite, *Paraelaphostrongylus andersoni* . This file also contains Dr. Peterson's letter.			
50	Cohen, Yosef, Mcinnis, Pamela, Pastor, John, Naiman, Robert.	1988	Estimating the effect of browsing on shrub biomass production; submitted to Oecologia	ISRO
	Generic models for plant growth are used to derive the growth rate parameter of plants and to estimate annual biomass production by plants. The authors show that shrub diameter at base can be used to estimate biomass production. The models are applied to data on biomass production by woody vegetation on Isle Royale where some species are exposed to browsing by moose. Of the species samples aspen grew fastest, whereas unbrowsed balsam fir was the slowest growing species. Balsam firs which showed signs of browsing by moose grew at a rate significantly higher than unbrowsed individuals.			
51	Cole, James E.	1952	1952 Spring investigations of moose browsing intensity on Isle Royale National Park	ISRO
	no abstract available			
52	Cole, James E.	1956	1956 winter wildlife study, Isle Royale National Park	ISRO
	This report is by the first National Park Service biologist to study the moose on the island. The report concluded that the moose population was growing and predicted problems because of lack of browse and deteriorating habitat. It recommended the introduction of a predator, i.e., wolf, to the island to help stabilize the moose population. Preparer's Note: See Citation for Durward Allen (Editor). 1969. Field Reports by James E. Cole, covering work on wolves in Isle Royale National Park, 1953-1957.			
53	Cole, James E.	1952	Report on field trip to Isle Royale, spring 1952 memorandum report to regional naturalist, region two, from Biologist	ISRO
	no abstract available			
54	Cole, James E.	1953	Special report - winter study, 1953 - Isle Royale National Park memorandum report to regional naturalist, region two, National Park Service, from Biologist file coded N1459 ISRO	ISRO
	no abstract available			
55	Cole, James E.	1954	Report on investigation of Isle Royale National Park typewritten report to regional naturalist of region two from biologist, National Park Service	ISRO
	no abstract available			
56	Cole, James E.	1956	Special report - 1956 wildlife study, Isle Royale National Park memorandum report to superintendent, Isle Royale National Park, from biologist, Rocky Mountain National Park and Shadow Mountain National Recreation Area	ISRO
	no abstract available			
57	Cole, James E.	1957	Moose-wolf relationships, Isle Royale, fall 1956	ISRO
	no abstract available			

58	Cole, James E.	1957	Isle Royale wildlife investigations: winter of 1956-1957	ISRO
	The first definitive report of the moose and wolves on Isle Royale. Moose were censused and observed for behavior, feeding habits, browse utilization, distribution, aggregations, multiple calves, cow-bull ratios and mortality. The report includes information on moose population from aerial census completed in 1943, 1945, and 1947. Wolves were censused and observed for behavior, hunting, kill rates, travels. Other wildlife observations include red fox, Canada lynx, ravens, and sharptailed grouse. Though coyotes are mentioned, no actual animals were seen; just one set of tracks.			
59	Crete, M.	1988	Forestry practices in Quebec and Ontario in relation to moose population dynamics; The Forestry Chronicle	ISRO, VOYA
	Abundant forage, particularly twigs of deciduous species, represent the key element of K carrying capacity for moose. Forest fire previously created such quality habitat, while timber harvest should now play a comparable role. Management units for moose habitat should cover 40-50 square km. Hunting and predation represent the regulating factors of most moose populations in Quebec and Ontario, so that habitat is only lightly used. This situation poses difficulties in evaluating the role played by forestry practices on population dynamics; the logging of a new area, which creates accessibility and removes much cover, greatly exposes moose to hunting until regrowth again provides a visual screen. Moreover, the increasing use of herbicide in forestry, to eliminate deciduous species, represents a potential threat for moose habitat.			
60	Danell, K., Bergstrom, R., Edenius, L.	1994	Effect of large mammalian browsers on architecture, biomass, and nutrients of woody plants; Journal of Mammalogy	ISRO
	no abstract available			
61	Daues, Tom V.	1990	Status of furbearers and moose in Pictured Rocks National Lakeshore: Spring 1990 progress report	PIRO
	Winter track counts were used to determine the relative densities of furbearers in Pictured Rocks National Lakeshore. Transects traversed a proportionate number of each of five habitat types found within the park. Aerial beaver surveys were also conducted for the entire lakeshore in the fall of 1989 to determine the location of active and inactive lodges. Other data was provided by the Michigan DNR and through interviews with local trappers and biologists.			
62	De Waal Malefyt, James J.	1974	Abundance of moose, hares, and red squirrels related to various seral stages of spruce-fir-birch forests on Isle Royale	ISRO
	A study showing that the moose, snowshoe hares, and red squirrels occupy different areas and habitats on the island in relation to the composition of the forests. This study is concerned with some of the ecological relationships which affect the relative abundance of these mammals. In particular, emphasis was given to the relationship between population size and the availability of food and cover in the various post-fire communities of the island's boreal forest.			
63	Delguidice, Glenn D., Peterson, Rolf O., Samuels,	1997	Trends of winter nutritional restriction, ticks, and numbers of moose on Isle Royale; Journal of Wildlife Management	ISRO
	Winter nutritional restriction of moose and moose numbers on Isle Royale were monitored over a seven year study. Moose population numbers initially decreased during this period, but then soared to an historic high. Mean urea nitrogen:creatinine ratios declined, but there was a difference between that of west-end moose and east-end moose. An epizootic of the winter tick (*Dermacentor albipictus*) appeared to be involved.			
64	Delguidice, Glenn D., Peterson, Rolf O., Seal,	1991	Differences in urinary chemistry profiles of moose on Isle Royale during winter; Journal of Wildlife Diseases	ISRO
	The objective of this study was to compare chemistry profiles of moose urine on the east and west ends of the island and to assess the physiological status of moose during the study period. Throughout both winters, elevated urinary urea nitrogen:creatinine ratios in snow-urine samples collected from east-end moose compared to west-end moose indicated greater dietary energy deprivation and accelerated net catabolism of endogenous protein.			
65	Duncan, Nancy S.	1989	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach (July 1, 1989 - December 31, 1989)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report.			

66				
	Duncan, Nancy S.	1990	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach (January 1, 1990 - June 30, 1990)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report.			
67				
	Duncan, Nancy S.	1992	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach (July 1, 1991 - December 31, 1991)	VOYA
	This project uses geographic information systems (GIS) to aid in evaluation of two recently developed habitat suitability index (HSI) models for moose (by Allen, et al. 1988, see Bibkey ID# 59342). Progress made on this project in the last year and a half is detailed in this report. Data was collected from sample plots in Voyageurs National Park.			
68	Dustin, Fred	1931	An archeological reconnaissance of Isle Royale, Michigan survey of Isle Royale, Michigan, by direction of the fifty-fifth legislature of Michigan anthropological reports	ISRO
	Presents locations, descriptions and findings of excavations of ancient copper mining pits, villages, and campsites on Isle Royale. Some of the findings include bones of moose and beaver.			
69	East, Ben	1931	Winter sky roads to Isle Royale (sic); National Geographic Magazine	ISRO
	Written shortly after Isle Royale was added to the National Park System, this author was one of a party of three commissioned to bring back the first photos of Isle Royale in winter and to determine the condition of the moose during that season.			
70	East, Ben	1935	Starvation stalks Isle Royale moose; American Forests	ISRO
	no abstract available			
71	East, Ben	1935	Must Isle Royale moose starve; American Forests	ISRO
	no abstract available			
72	East, Ben	1973	The spring we moved the moose; Outdoor Life	ISRO
	Describes live-trapping of moose on Isle Royale in 1934-36 in an attempt to relocate some of the starving island moose to the Michigan's upper peninsula.			
73	Edwards, Joan	1976	Learning to eat by following the mother in moose calves; American Midland Naturalist	ISRO
	Little, if any, work has been done on how young ruminants learn which plants to eat. Observations of moose (*Alces alces andersoni*) calves in Isle Royale National Park, suggest that learning by following may play an important role in how calves learn to eat.			
74	Edwards, Joan	1978	Moose-vegetation interactions at the northeastern end of Isle Royale National Park, Michigan	ISRO
	A study focusing on the influence of moose feeding behavior on vegetation change at Isle Royale National Park to see if herbivory by moose lowers the fruit production, leaf production, and survivorship of the individual plant. The effects of leaf removal on the reproductive success and survivorship of individual plants was measured. Then, the following variables were measures as to how they influence the probability of an individual plant's being eaten: 1) the distribution of moose, 2) the diet diversity for different classes of moose; and 3) the changes in food choice in response to changes in the temporal and spatial availability of food items.			
75	Edwards, Joan	1983	Diet shifts in moose due to predator avoidance; Oecologia (Berlin)	ISRO
	On Isle Royale, Michigan, moose cows which have calves show a different distribution and diet from solitary adults and yearling moose. Solitary adults and yearlings in the presence of wolves feed on the ridges of the main island, where they take advantage of plants that leaf early; only later in the season do they move to the small outlying islands where plant phenology is delayed by the cold water of Lake Superior. Cows with calves deviate sharply from this pattern. They remain on the wolf-free small islands throughout the growing season. On the islands, cows with calves eat a poorer quality diet than other moose. This study suggests that in order to avoid predators, cows with calves sacrifice the high quality diet available on the main island. These data also suggest that the wolves not only affect prey numbers by direct kills but may also indirectly influence prey numbers by altering the diet of their prey. In this case, the reproductive cows, those individuals that contribute most directly to growth of the population, avoid predators but frequent poor feeding areas.			

76	Edwards, Joan	1983	Tongue grooming as a possible mode for the transfer of rumen microorganisms in moose; Le Naturaliste Canadien (Rev Ecol Syst)	ISRO
	Observations of moose (*Alces alces andersoni*) on Isle Royale National Park, Michigan, showed that tongue grooming, i.e., the cow licking the tongue or lips of her calf, occurs in the wild at the time when calves begin to eat plants. These findings suggest that tongue grooming is an important mechanism by which moose calves obtain rumen microorganisms.			
77	Edwards, Joan	1985	Effects of herbivory by moose on flower and fruit production of *Aralia nudicaulis* ; Journal of Ecology	ISRO
	The effects of herbivory by moose (*Alces alces*) on the demography of the perennial herb Aralia nudicaulis were studied by determining the frequency and pattern of herbivory and by measuring the survivorship and reproduction of shoots of plants clipped experimentally. Results showed that herbivory significantly altered the population structure of *A. nudicaulis* by reducing the total number of flowering shoots and decreasing fruit production. Study sites were on the northeast end of Isle Royale National Park, MI.			
78	Eide, Rune, Peterson, Rolf O.	1997	Changes in mercury exposure in the Great Lakes area, USA, as shown by the mercury content of moose molars	ISRO
	A study to determine if there has been an increase in the mercury content of moose molars from moose at Isle Royale National Park.			
79	Eliot, John L.	1985	Isle Royale - a north woods park primeval; National Geographic	ISRO
	A popular account of Isle Royale National Park that focuses on shipwrecks and the wolf-moose research carried out by Rolf Peterson.			
80	Erskine, Laurie York	1922	Isle Royale invasion threatens kingdom of the moose; The Detroit News	ISRO
	This article concerns the moose on Isle Royale, but it also contains historical references to caribou, coyote, and lynx.			
81	Faaborg, Rhett	1981	The role of sodium in the growth of a boreal-pond macrophyte, and the impact of macrophyte herbivory by moose upon sodium flux in the watershed	ISRO
	The author examines the interrelationships between sodium, aquatic macrophytes, and moose (*Alces alces*) within a biogeochemical framework. This thesis is divided into two chapters corresponding to separate, but related, papers. The first chapter, "Experimental demonstration of sodium as a growth factor in the pondweed *Potamogeton alpinus* and of sodium pathways within a natural pond, describes the effects of experimental variation of environment sodium concentration on plant growth and provides a description of sodium flux routes among plant, water and substrate compartments. The second chapter, "The impact of aquatic foraging by moose on sodium dynamics and aquatic macrophytes in a boreal watershed," explores ways in which moose might affect sodium flux within a pond and its watershed, thereby affecting aquatic plants and the moose which feed on them.			
82	Felsk, Joshua	1996	1996 Investigators annual report: documentation of insect fauna found on moose carcasses in the Rock Harbor area	ISRO
	Presents a list of insects found utilizing moose carcasses on Isle Royale.			
83	Fettig, Stephen M.	1995	Succession in a yellow birch forest subject to moose browsing	ISRO
	Herbivory by moose can alter forest structure and composition by slowing or preventing vertical growth of browsed tree species. Changes in plant cover were examined on fixed plots in a yellow birch-dominated upland forest of southwestern Isle Royale. Percent cover in 7 height strata was recorded first in the 1960s and then in 1992. During the interval, percent cover decreased in the 1-m and 2-m strata. Percent cover increased in the 8-m stratum. Balsam fir and white birch decreased in the canopy due to mortality from natural longevity plus failure to replace themselves most likely due to continuous suppression of reproduction by moose since the 1920s. White spruce, which is not browsed by moose, increased in the 4-m stratum, and was the only species by all evidence to have escaped herbivory by moose. Sugar maple, mountain maple, yellow birch, paper birch, and mountain ash decreased in strata reachable by moose. At densities > 3 moose/km2, as older canopy-height trees have died, herbivory by moose has apparently been shifting the canopy composition toward an open white spruce or white cedar structure.			
84	Foster, Michael J.	no date	Echinococcus granulosus on Isle Royale	ISRO
	A college research paper which describes the life cycle of the hydatid tapeworm (*Echinococcus granulosus*) and its role in the predator-prey relationship of wolves and moose on Isle Royale.			

85	Fuller, Todd K.	1986	Observations of moose, *Alces alces* , in peripheral range in north central Minnesota; The Canadian Field-Naturalist	VOYA
	Moose (*Alces alces*) and moose sign were observed during November-May 1981-1985 in and near a 839 km2 area in north central Minnesota that is on the periphery of moose range in the state. Data from aerial surveys in winter and pellet group counts in spring conducted primarily to determine numbers of white-tailed deer indicated a winter moose density of only 2/100 km2. During winter, calves constituted 15 of 63 (24%) moose seen; 44% of adults were bulls. No evidence of wolf predation on moose was found, but wolves did scavenge carcasses of at least seven moose that probably died of other causes. Most deaths of moose at least 6 months old likely were due either to deer hunters or to the brainworm *Parelaphostrongylus tenuis* . Adult worms were found in the brain of a dead 10-month old calf, and first stage larvae occurred in 30 of 37 (81%) deer pellets sampled in the study area.			
86	Garton, E.A.	1975	The moose-wolf-plant community of Isle Royale: a realistic simulation model; Bulletin of the Ecological Society of America	ISRO
	no abstract available			
87	Gazis, D.C., Montroll, E.W., Ryniker, J.E.	1973	Age-specific, deterministic model of predator-prey populations: application to Isle Royale; IBM Journal of Research Development	ISRO
	A deterministic model is proposed for the description of predator-prey systems in which the prey has an age-specific vulnerability to predation. The model is developed on the basis of observations of the moose and wolf populations of Isle Royale, Michigan. The moose are divided into three groups, the very young, the adults, and the very old or sick. The three groups have different vulnerability to wolf predation by a single population of wolves. The model incorporates a saturation effect for the moose population and a satiation effect for the wolf population. It appears to reproduce quite well the almost monotonic trend toward equilibrium observed since the arrival of the wolves on the island.			
88	Gogan, Peter J. P.	1989	Protocol for the capture and restraint of moose, Winter 1989	VOYA
	Collection of an in-house protocol (6 p.) and hand-written notes (7 p.) on moose immobilization and collaring in Voyageurs National Park, Winter 1989. Protocol contains very specific procedures to be followed including drug dosages and equipment handling.			
89	Grigal, David F.	1988	Testing of the habitat suitability index models: moose, Lake Superior region - a geographic information systems approach: a research proposal	VOYA
	This research proposal is designed to test the Habitat Suitability Index model for Moose of the Superior Region. Moose are an integral part of the southern boreal forest ecosystem, and the ability to predict potential impacts of resource manipulation on moose habitat is essential to the land management process. Field testing of both Model I and Model II in the moose HSI model (Allen et al. 1988) will be done utilizing Geographic Information Systems in areas of Voyageurs National Park and Superior National Forest. These two areas have different management goals and activities, reflected in different seral stages of vegetation, so comparisons of moose habitat can be made and an assessment of impacts of resource manipulation formulated. Also see progress reports by Nancy Duncan, PH.D. candidate.			
90	Grigal, David F.	1989	Testing of the habitat suitability index model for moose in Voyageurs National Park and adjacent areas of Superior National Forest - a geographic information systems approach	VOYA
	This is a June 1989 revision of the actual cooperative agreement between the National Park Service and the University of Minnesota (same title). Study objectives, individual party responsibilities, and budget are described.			
91	Hakala, D. Robert	no date	Moose triplets, hitch-hiking and tragedy	ISRO
	A narrative of three episodes in the lives of a moose family on Isle Royale.			
92	Hakala, D. Robert	1953	Story on moose browse and wildlife study at Isle Royale Feb 17 to March 16, 1953, biologist James Cole of National Park Service region two office in Omaha, Nebraska and park ranger D Robert Hakala of Isle Royale National Park participating	ISRO
	Biologist Cole and Ranger Hakala made a winter trip to Isle Royale in 1953 and observed wolves, coyotes, and moose. Range			
93	Hamilton, B.	1996	1996 Preliminary study of moose calving sites on the Grand Portage Reservation	GRPO
	no abstract available			

94	Hanson, H.L., Krefting, Laurits W., Kurmis, Vilis	1933	The forests of Isle Royale in relation to fire history and wildlife; Technical Bulletin 294	ISRO
	A classic early study that looked at the fire history of the island, primarily since the late 1800s. Fires were both natural and human caused; the latter often from logging operations. Fires have played a dominant role in the composition and age structure of forest stands on the island and in turn this has influenced the distribution and abundance of animal populations, particularly moose. It also talks about the role fires played in the survival and demise of caribou on the island.			
95	Haynes, Gary	1980	Evidence of carnivore gnawing on Pleistocene and recent mammalian bones; Paleobiology	ISRO
	Based on inspection of gnawing damage done to bones of modern prey animals, sets of typical damage types or patterns are recognized for certain elements. The presence of these damage patterns suggests carnivore activity even when bones exhibit no identifiable tooth marks or other obvious sign of gnawing. Observations are made of these damage types on bones of Pleistocene and recent North American mammals. Damage to the following elements is briefly described: antlers, vertebrae, scapulae, humeri, ulnae, radii, femora, tibiae, metapodials, and innominates. Studies done on moose at Isle Royale.			
96	Haynes, Gary	1982	Utilization and skeletal disturbances of North American prey carcasses; Arctic	ISRO
	More than 125 carcasses and skeletal remains of wild bison, moose, and whitetail deer were examined in the field. Most were from closely documented episodes of predation, mass drowning, or other natural causes of death. Predictable and unusual kinds of bone and carcass utilization by timber wolves and bears are described. The variables emphasized include sectioning of carcasses by feeding predators, distribution and dispersal of bones at kill sites, gnaw damage to bones in home sites, kill sites and scavenge sites, potential or observed survival of bones at sites of prey carcasses, and the patterns of scatter or accumulation of skeletal remains in moose and bison ranges due to predation or other natural causes of death. Variations in gnaw damage to bones and utilization of carcasses by carnivores reflect significant aspects of predator-prey interactions, and can be deciphered by ecologists interpreting either fossil or modern assemblages of bones. Main study areas were Isle Royale National Park, Superior National Forest, WI and Wood Buffalo National Park, Canada.			
97	Haynes, Gary	1983	Frequencies of spiral and green-bone fractures on ungulate limb bones in modern surface assemblages; American Antiquity	ISRO
	During observational fieldwork in undisturbed ranges of free-roaming bison and moose (Wood Buffalo National Park, Canada, Superior National Forest, WI and Isle Royale), the author has identified approximately 8% of surface bones as spirally or green-fractured due to documented carnivore activity, and 5% as spirally or green-fractured due to trampling or dust wallowing by bison. The bones of smaller species suffer up to 50% breakage. Bone modifications by wild wolves and bears are briefly described, as are characteristics of fractures caused by trampling and wallowing.			
98	Hepinstall, Jeffrey Ahrens	1992	Application of the Lake Superior region moose habitat suitability index model to an area of the Superior National Forest using a geographic information system	VOYA
	This thesis is organized as four semi-independent papers. The first paper (Chapter 1) discussed the Habitat Suitability Index (HSI) concept in general and the Lake Superior region moose HSI in particular. The second paper (Chapter 2) consists of the results of field work conducted during the late winter of 1992 in the Coffee Creek Opportunity Area, Superior National Forest. The third paper (Chapter 3) describes a method for applying the moose HSI using only information readily available at the Forest Service district level. The fourth paper (Chapter 4) is a manuscript in preparation for submission to a geographic information system-based (GIS) journal and is aimed at a GIS-literate audience. It explores methods for calculating the moose HSI using GIS.			
99	Hickie, Paul F.	1936	Isle Royale moose studies; IN: wildlife restoration and conservation; proceedings of the North American wildlife conference called by President Franklin D Roosevelt, 11:396-398 (note: See also papers of the Michigan academy of sciences, arts, and letters 2:627-639)	ISRO
	Presents information on the live-trapping and transportation of moose from ISRO to Michigan's Upper Peninsula in the winter of 1934-35 when many moose were dying from malnutrition. Also discusses how emergency feeding of the moose was accomplished.			

100	Hickie, Paul F.	1930	Michigan moose	ISRO
	no abstract available			
101	Hickie, Paul F.	1937	A preliminary report on the past and present status of the moose, *Alces Americana* (Clinton), in Michigan; Papers of the Michigan Academy of Science, Arts and Letters	ISRO
	no abstract available			
102	Hickie, Paul F., Coburn, Donald R.	1934	Michigan Department of Conservation Game Division report on the Moose of Isle Royale	ISRO
	A report made on the condition of the Isle Royale moose herd. Includes pathological findings from moose autopsies, necropsy, bacteriological findings, and findings from study of microscopic anatomy. Summary and Conclusions point to the loss of moose from shortage of food associated with severe winter weather. Observations were made of the condition of the vegetation which provides food for the moose. Management options are presented and discussed.			
103	Hickie, Paul F., Coburn, Donald R.	1935	Report on the moose of Isle Royale	ISRO
	This report covers the time when the very high moose population of the late 1920s and early 1930s was undergoing a drastic decline due to lack of available forage and nutritional stress. It speculates that the decline would continue and that moose might be eventually eliminated on the island if management did not intervene. Five methods of managing the moose situation are discussed: supervised hunting, removal (hunting) by state employees, the introduction of predators, trapping and removal, and feeding.			
104	Hindelang, Mary	1996	Skeletal integrity of Isle Royale moose: a study of bone mineral density and osteopathy related to senescence	ISRO
	Skeletal remains of moose were collected to study the relationships among age, sex, skeletal status, and senescence. Four chapters from this dissertation were published as journal articles: 1) Hindelang, M., R.O. Peterson, and A.L. McLean, 1992, Osteoporosis in moose on Isle Royale: A pilot study of bone mineral density using CT scans, Alces 28:35-39. 2) Hindelang, M. and R.O. Peterson, 1996, Osteoporotic skull lesions in moose at Isle Royale National Park, Journal of Wildlife Diseases 32(1):105-108. 3) Hindelang, M. and R.O. Peterson, 1994, Moose senescence related to tooth wear, Alces 30:9-12. 4) Hindelang, M. and R.O. Peterson, 1993, Relationship of mandibular toothwear to sex, age, and periodontal disease of Isle Royale Moose, Alces 29:63-73. The remaining chapters are: 5) Digital image enhancement of quantitative computed tomography (QCT) scans of moose bones, 6) Biomechanical properties of metatarsal trabecular bone from moose in Isle Royale National Park, 7) Age and sex related changes in cross sectional cortical bone measurements in moose of Isle Royale, and 8) Bone mineral density and osteopathy related to senescence.			
105	Hindelang, Mary, Peterson, Rolf O.	1994	Moose senescence related to tooth wear; Alces	ISRO
	Tooth wear in moose (*Alces alces*) generally follows an age-related sequence. The enamel-dentine interface forms and intricate pattern representing the effective cutting edge of teeth. The authors measured the cutting edges of mandibles from wear classes from ISRO moose skeletal remains. They calculated cutting edge for each tooth and tooth row for all wear classes, scales to a constant tooth row length. Results suggest that effective cutting surface increases until wear class V and then declines, consistent with progressive eruption and tooth wear. Late eruption of the third molar helps maintain a constant cutting edge for several years after older teeth have deteriorated. Senescence corresponds to the period of tooth decline.			
106	Hindelang, Mary, Peterson, Rolf O.	1996	Osteoporotic skull lesions in moose at Isle Royale National Park; Journal of Wildlife Diseases	ISRO
	Osteoporotic lesions were evaluated in the skulls of moose (*Alces alces*) collected in Isle Royale National park from 1958 to 1994. Circular lesions which penetrated the outer table of the skull were distributed over the frontal and nasal bones asymmetrically in both sexes. About 32% of skulls recovered had some porotic lesions with slightly greater prevalence among males.			

107	Hindelang, Mary, Peterson, Rolf O.	1993	Relationship of mandibular tooth wear to gender, age and periodontal disease of Isle Royale moose; Alces	ISRO
	The literature was reviewed for current age determination techniques, and for differences in foraging habits that may affect tooth wear and periodontal disease. The authors analyzed the relationship between wear-class and age determined by cementum annuli in over one thousand moose older than one year which died in Isle Royale National Park. In this large sample, the authors found that age determination by wear-class correlated well with cementum annuli counts, however, variance in age increased as wear-class increased. They compared the distribution of age and wear-class by gender to determine if dimorphism existed in rates of wear on occlusal surfaces. In the higher wear-classes, the mean age of bulls was significantly younger than the mean age of cows, indicating that males experienced greater wear on their teeth at an earlier age. They also found high correlations between age, periodontal disease and mandibular tooth wear suggesting that mandibular and periodontal dynamics are important physiological processes that influence longevity in moose.			
108	Hindelang, Mary, Peterson, Rolf O., Maclean, Ann L.	1992	Osteoporosis in moose on Isle Royale: A pilot study of bone mineral density using CT scans; Alces	ISRO
	Osteoporosis and other skeletal pathologies have been observed in the bones of moose (*Alces alces*) collected in Isle Royale National park. It is hypothesized that bone mineral density of a distal bone may be an indicator of pervasive skeletal pathology. Computerized tomography (CT) scans were conducted in the metatarsal bones of two male moose, one without any notes skeletal pathology and the other exhibiting advanced periodontal disease, severe osteoarthritis, and osteoporosis of the skull. The CT scans, when enhanced using computerized image enhancement techniques, showed measurably less density in the metatarsus of the moose with skeletal pathology than the moose with no observed pathology. The use of this technique in wildlife studies holds promise for investigations of skeletal abnormalities and for determining how these pathologies affect population dynamics.			
109	Hindelang, Mary, Peterson, Rolf O.; Van Stappen, Julie	1996	Senscence and skeletal pathologies in moose in Isle Royale National Park (ABSTRACT); proceedings of the Lake Superior National Parks research conference	ISRO
	In 1995 the Isle Royale moose population contained a larger proportion of older moose. This provided the opportunity for studying age-related changes in viability. The most prevalent age-related changes include: increased tooth wear and subsequent decline in cutting surface of teeth, periodontal disease, decreased bone mineral density, osteoporosis, and osteoarthritis.			
110	Hirschmann, Fred	1980	Wildlife sightings in and near Voyageurs National Park	VOYA
	Collection of notes, observation cards and typed accounts of unusual wildlife sightings in areas around and in Voyageurs National Park. Sightings include wolverine, cougar, moose, and the spring "sucker" run on the Moose River.			
111	Hobbs, H. C.	1982	Drainage relationships of glacial lakes Aitkin, Upham, and early Lake Agassiz in northeastern Minnesota	SACN
	no abstract available			
112	Hobbs, H. C.	1983	Drainage relationship of glacial Lake Aitkin and Upham and early Lake Agassiz in northeastern Minnesota	SACN
	no abstract available			
113	Hobbs, Thomas O.	1989	NPS memo to all Isle Royale National Park employees	ISRO
	Explains results to date on the lyme disease study carried out by Rolf Peterson and Dr. Elizabeth Burgess at Isle Royale. *Borrelia borgdorferi* , the lyme disease spirochete was isolated from one moose tick larva on ISRO. Note: there is not a copy of the final report for this research project in this file; only the research proposals are present. That is why this memo is included.			
114	Isle Royale National Park	1982	Moose/wolf research project briefing paper	ISRO
	The report begins with a brief background paragraph concerning the arrival of the wolf to Isle Royale and the initiation of a long-term research project to study the wolf. It also addresses the future of Isle Royale wolves, the value of the Isle Royale moose/wolf study, its current funding status and funding concerns for the future.			

115	Janke, Robert A.	1976	Moose-boreal forest ecology in Isle Royale National Park; proceedings of the 12th North American Moose Conference, St John's Newfoundland	ISRO
	Moose (*Alces alces*) have greatly altered the boreal forest type of Isle Royale since they arrived in 1916. Forest tree density has been considerably reduced while average tree basal area has increased. This is mostly due to a reduction in balsam fir and mountain ash especially in the younger age classes. Paper birch densities were not noticeably affected in older forests, probably because they were mostly out of reach when the moose first arrived. White spruce, unpalatable to moose increased in density. In a large area burned since moose arrived, dense stands of paper birch along with small quantities of aspen have survived to the present day despite heavy moose browsing. Average shrub height has been reduced by perent shrub cover has been unaffected. Low vascular plant ground cover has greatly increased. *Taxus canadensis* has been almost eradicated wherever low browsing pressure has existed. Moose have inhabited Isle Royale since about 1910. Their effects on the vegetation are conspicuous everywhere. The aim of this study was to determine how moose have affected the species composition and structure of the upland boreal forest type.			
116	Janke, Robert A.	1979	Moose-forest-fire ecology in Isle Royale National Park; proceedings of the first conference on scientific research in the National Parks, USDI, National Park Service transactions and proceedings	ISRO
	This study is a phase of a long-term research project on the ecology of the upland boreal forest type on Isle Royale National Park. It is concerned with relationships between moose, fire, and the forest ecosystem. Fire and moose appear to be the two most important environmental influences affecting Isle Royale forests. Moose browsing has dramatically altered the upland boreal type forest of Isle Royale. Post-fire successional trends are discussed.			
117	Johnson, J.T.	1995	1995 Grand Portage aerial moose survey	GRPO
	no abstract available			
118	Johnson, J.T.	1996	1996 Grand Portage aerial moose survey	GRPO
	no abstract available			
119	Johnson, J.T.	1997	1997 Grand Portage aerial moose survey	GRPO
	no abstract available			
120	Johnson, Wendel John, Wolfe, Michael L. Jr., Allen, Durward L.	1967	Community relationships and population dynamics of terrestrial mammals on Isle Royale, Lake Superior, first annual report, 1966-1967	ISRO
	This was the ninth year in the investigation of Isle Royale mammals carried out by Purdue University and the National Park Service. This report begins an investigation of the terrestrial small mammal community on Isle Royale. Species studied were the red fox (*Vulpes f. fulva*), snowshoe hare (*Lepus A. americanus Erxelben*), red squirrel (*Tamiasciurus hudsonicus regalis* A. H. Howell), and Woodland deermouse (*Peromyscus m. maniculatus*). Moose-wolf studies were carried out during the winter period. Described in this report is moose numbers and productivity; sex, age, and condition of moose killed by wolves; condition and pathology of moose killed by non-redatory causes; wolf numbers, winter, 1967; and wolf aggressions and movements.			
121	Johnson, Wendel John, Wolfe, Michael L. Jr., Allen, Durward L.	1968	Community relationships and population dynamics of terrestrial mammals of Isle Royale, Lake Superior, second annual report, 1967-1968 (covering the tenth year in the Isle Royale Studies)	ISRO
	This report covers the winter study period in 1968 describing the winter weather conditions, moose-wolf relationships, moose numbers, the moose herd composition, and moose calf production and survival. Information on summer moose observations in 1967 are presented including the condition of the moose, incidence of lumpy-jaw in adult moose and other pathology, fat reserves, age of moose, and condition of moose killed by non-predatory causes. The wolf population was measured, travel patterns and social organization of wolves were observed, predation patterns and wolf mortality are described. The immigration of a pack of seven wolves in February of 1967 is discussed. The terrestrial small mammal community was studied primarily focusing on the red fox and three of its principle prey species: the snowshoe hare, red squirrel and deer mouse.			

122	Johnson, Wendel John, Wolfe, Michael L., Allen, Durward L.	1969	Community relationships and population dynamics of terrestrial mammals of Isle Royale, Lake Superior - third annual report (covering the eleventh year in the Isle Royale studies)	ISRO
	Presents information from observations made during the winter study period in 1969. Observations of the moose population include moose numbers and winter distribution; winter aerial census of moose; sex, age, and condition of moose killed by wolves; and investigations of moose mortality patterns. Observations of the wolf population include wolf numbers, social structure, and predation habits; and wolf mortality. Observations of terrestrial small mammals is included for red fox, snowshoe hare, red squirrel, and deer mouse.			
123	Johnson, Wendel John, Wolfe, Michael L. Jr., Allen, Durward L.	1970	Community relationships and population dynamics of terrestrial mammals of Isle Royale, Lake Superior, fourth annual report, 1969-1970 (covering the twelfth year in the Isle Royale studies)	ISRO
	Summarizes the major findings of Wendel Johnson's thesis work on the terrestrial small mammal populations of Isle Royale, focusing on the red fox and its principal prey species: the snowshoe hare, red squirrel and deer mouse. Presents information from the winter study period on Isle Royale in 1970. Winter weather conditions are described and wolf observations are presented; the wolf population was estimated at 18. The moose population was counted and mortality estimated. The entire collection of moose skeleton with teeth were aged. The beaver population was also studied in this year; the population increased by 25 percent. The tracks of one lynx were observed.			
124	Jordan, Peter A.	1964	Ecology and coactions of the moose on Isle Royale, first annual report, 1963-1964	ISRO
	Work completed in 1963-1964 was largely concerned with collecting records on moose herd composition and studies of breeding behavior. The production and survival of moose calves was measured, mortality and physical condition of the moose is discussed, and the population was measured. Food habits and behavior of moose was observed. Wolves were studied during winter aerial observations; the population of wolves was measured, wolf movements were observed, pack structure and social relationships were described. Wolf-moose relationships are described.			
125	Jordan, Peter A.	1965	Studies of the moose and wolves of Isle Royale - Second annual report, 1964-1965	ISRO
	This report covers the second year of a three-year investigation of the ecology and dynamics of the moose in Isle Royale National Park. This study is concerned with population dynamics, pathology (fat stores, *Echinococcus granulosus* tapeworm cysts, lumpy jaw, arthritis, and other parasites), habitat relationships and behavior of the moose. Particular attention is given to the numbers and health status of moose killed by the wolves. Information on wolves is also recorded. The wolves have a vital role as predators, and their status is pertinent in the ecology of moose. Information on numbers, reproductive success, hunting habits, and original observations on social behavior of the wolves is described.			
126	Jordan, Peter A.	1966	Studies of the moose and wolves of Isle Royale - Third annual report, 1965-1966	ISRO
	This is the final report on a three year investigation into the ecology and dynamics of the moose of Isle Royale National Park. This study has been concerned with population dynamics, pathology, habitat relationships, and behavior of the moose. Particular attention is being given to the characteristics of those moose killed by wolves. A population estimate of 721 moose was arrived at by using a new sampling method done by aerial survey which unexpectedly resulted in a greater sampling error than surveys done previously. Results of three years of population estimates and distribution according to pellet counts are presented. Investigations into moose productivity and mortality are discussed. The best estimate of Isle Royale's wolf population for the winter of 1965-66 is 25, less 2 known to be dead. Information is presented as to the pack structure and reproduction, social relationships in the large pack, patterns of travel and hunting in the large pack, and rate and distribution of kills.			
127	Jordan, Peter A.	1978	Miscellaneous information and speculation on moose and their impact on vegetation and on some other herbivores at Isle Royale	ISRO
	History of the moose population at Isle Royale; foods the moose use at different seasons of the year; the impacts moose have on the vegetation at Isle Royale; and aquatic feeding by moose.			
128	Jordan, Peter A.	1978	Miscellaneous information and speculation on moose and their impact on vegetation and on some other herbivores at Isle Royale	ISRO
	Provides chronological history of moose at Isle Royale, describes moose food preferences (including a rating of species attractiveness to moose as food and the trend for those species), and the impact of moose browse on various species. The importance of aquatic foods for moose, particularly as a source of sodium, is discussed.			

129	Jordan, Peter A.	1980	Pellet counts	ISRO
	These computer files contain Peter Jordan's moose and snowshoe hare pellet counts for his transects at Isle Royale National Park. Each Year is a different file. Years included are 1980, 1983, 1987, 1989, 1990, 1992, 1993, 1994.			
130	Jordan, Peter A.	1981	1981 investigators annual report - population trends and distribution in moose and hares and the interactions of these herbivores with their vegetational resource	ISRO
	Presents progress to date on moose pellet counts, estimates of winter distribution and relative abundance of hares, browse available and browse used during winter, calibration of the "grab-method" of estimating summer browse, and other activities. Significant findings are presented.			
131	Jordan, Peter A.	1982	Continuing studies of moose-plant relationships at Isle Royale National Park	ISRO
	This report covers segments of several studies spanning several years. Production of winter browse and its utilization by moose was estimated from four sites on the island for winter 1976-1977. A new 2-stage, optimal-allocation sampling scheme was employed. Numbers of moose overwintering were estimated from spring counts of pellet groups on 327 permanent plots. Snowshoe hare pellets were also counted. By comparing some Isle Royale forest stands with similar forests on the adjacent mainland, the author showed that intermediate-size classes of platable tree species (fir, aspen, white birch and mountain ash) comprised far less of the species' population on the island than on the mainland. This effect appears due primarily if not entirely to the long-term impact of moose. Implications of moose impact on the long-term dynamics and form of Isle Royale forests is discussed. Evidence of lamprey larvae was found in Washington Creek in 1977. No effects upon moose or the aquatic vegetation they eat from lampreycide treatments in Washington Creek were discovered.			
132	Jordan, Peter A.	1982	Continuing studies of the feeding ecology and ecosystem dynamics of moose and other mammals at Isle Royale National Park	ISRO
	This report covers several separate projects, some of which were parts of long term investigations. The overall theme is the search for greater understanding of the ecosystem dynamics of a protected and insular site where the role of herbivorous mammals is far more pronounced than in most sectors of the northern hardwood and boreal forest biomes. A pilot project to develop a more precise sampling technique for documenting production of woody browse and its utilization by moose in winter, where the forage resource is heavily used, is described. Moose numbers and winter distribution were estimated for 1974-1975 from counts of pellets on permanent plots. Because the author long believed that the value of moose habitat is partly related to the diversity of resources available to the animals within an efficiently small cruising radius, an analysis was made to test this notion. The budgets of two nutritionally critical elements, nitrogen and phosphorus, were estimated for moose, hares, and beaver. Moose dominate in the dynamics of both storage and annual flux of these two elements.			
133	Jordan, Peter A.	1983	Continuing studies of moose-plant relationships relative to ecosystem dynamics at Isle Royale	ISRO
	In this phase of studies, primary emphasis was on feeding strategies of moose in summer and certain aspects of sodium dynamics in aquatic environments used by moose. The diverse diet of free-ranging ISRO moose was concluded to be part of the moose's inherent feeding behavior. Implications of this, both to habitat choice by moose and to influences on plant-community structure are discussed. For a typical beaver pond it was found that moose, by removing most of the macrophyte standing crop, which in turn has a high concentration of sodium, have but a minor effect on the overall sodium flux. The macrophytes contain but 0.5% of the total sodium moving through in one year. The author also discusses moose-caused turbidity and the growth of aquatic macrophytes, and production of aquatic plants and their consumption by moose.			
134	Jordan, Peter A.	1983	Continuing studies of the ecology of moose and their resources at Isle Royale National Park	ISRO
	The focus of this report includes continuation of annual estimates of numbers and ecological distribution of moose and hares in winter. A continuing effort was made to estimate total woody forage available to moose in winter and amounts that were consumed. Major emphasis was focused on aquatic ecosystems where moose feed on submerged plants in apparent search for sodium -- available there in good concentrations while not so in thir terrestrial forage sources. The principal focus of the aquatic ecosystem work was an experimental study on the dynamics of sodium in a typical beaver impoundment where moose were foraging for submerged aquatics. Experiments were conducted to determine the route of uptake of sodium by aquatic plants, whether changes in sodium concentration in the pond water would affect growth or sodium concentration in the plants, and whether terrestrial soil would support aquatic growth as well as natural pond substrate and, if not, whether sodium alone is responsible for the difference. The author also commented on how to justify permitting fires to burn in a manner wholly normal for the region and on the danger that moose might pose to park visitors.			

135	Jordan, Peter A.	1984	Continuing studies of moose-plant relationships at Isle Royale National Park	ISRO
	no abstract available			
136	Jordan, Peter A.	1987	Aquatic foraging and the sodium ecology of moose: a review; Swedish Wildlife Research	ISRO
	The proposition that aquatic vegetation is eaten by moose primarily as a source of sodium is explored in terms of sodium scarcity, other sources of sodium, and the animals' physiological needs. The use of salt licks and other sources, plus evidence of a salt drive, are examined. For aquatic foraging, species selection, sodium content, sites used, season, and consumption rates are described. Impacts of moose on aquatic communities are reviewed. Differing opinions about the salt drive observed during spring are presented and weighed. Conflicting evidence on these indicates a need for experimental research. Whether sodium supply may ever limit numbers and distribution of moose is explored. Movement of sodium through aquatic ecosystems is reviewed particularly as it relates to moose. Ecological implications and management suggestions are offered. Draws heavily on Isle Royale moose research and observations.			
137	Jordan, Peter A.	1988	1987 investigators annual report - long-term monitoring of moose, hare, and browse status at Isle Royale	ISRO
	Contains data on counts of pellets of moose and hares and the production of woody browse plants.			
138	Jordan, Peter A.	1995	Exclosure demonstration of predation effects by moose on a mixed northern forest; presented at annual meeting of the Ecological Society of American, so would this be in the Proceedings of the Ecological Society of America?	ISRO
	no abstract available			
139	Jordan, Peter A.	1995	Permanent plot locations and data bases for Isle Royale National Park - a report accompanying computer files	ISRO
	Since 1963, there has been an island-wide network of sampling plots on Isle Royale for studies of moose, snowshoe hare, vegetation and ecological interactions among these three. A project in 1994 was designed to document location of a sub-set of these plots using geographic information systems (GPS) technology. Other data was collected while visiting these plots: winter pellets of moose and snowshoe hares, browse available to moose and hares and amounts of this browse used by these animals in winter, forage available to and used by moose in summer, vegetation descriptions on plot areas, slope, exposure and drainage descriptions, the status of balsam fir relative to moose browsing and levels of current spruce -budworm infestation. Some new clusters of permanently marked plots were added during these trips.			
140	Jordan, Peter, A., Botkin, Daniel B.	1972	Analysis of the Isle Royale ecosystem: measurement and simulation of the flow of energy and nutrients among soil, vegetation, moose and wolves	ISRO
	no abstract available			
141	Jordan, Peter A., Botkin, Daniel B., Dominski, Anthony S., Lowendorf, Henry S., Belovsky, Gary E.	1973	Sodium as a critical nutrient for the moose of Isle Royale; transactions of the ninth North American moose conference and workshop, Quebec	ISRO
	Browse provides only 6% of the sodium requirement for moose but aquatic plants are estimated to supply 88% of moose's annual sodium requirement. They must store the sodium to offset the negative balance during the 9 to 10 months that aquatics are not available. The authors are exploring two possible mechanisms: Mineralized storage in hard tissue and substitution of potassium for sodium in saliva, hence in rumen fluid. Preliminary evidence indicates the latter strategy is employed. Heavy grazing in aquatic habitats threatens to reduce aquatic productivity, and will also reduce the primary source of sodium for moose. In their initial work on the sodium question, the authors are looking at both the adaptations in sodium storage and feeding strategies in moose and at the evidence that sodium is becoming increasingly critical to the Isle Royale Population.			

142	Jordan, Peter A., Botkin, Daniel B., Wolfe, Michael L.	1971	Biomass dynamics in a moose population; Ecology	ISRO
	From a simple model, we have calculated with a digital computer the standing crop, the gains in weight (secondary production), and the transfer of biomass by death (potential food for predators) on a monthly basis for all age and sex categories of the Isle Royale moose, a population unhunted by man and in equilibrium with its predator, the timber wolf. These estimates provide a more accurate and detailed picture than available before of biomass dynamics in a wild ungulate population. For this single-prey-single-predator system, results demonstrate that the accumulation of biomass in the prey population permits a steady flow of food to the predator, although production of food for the prey (woody and aquatic vegetation) is seasonally highly cyclic. The storage of biomass is examined in terms of the year classes of moose. Further uses of the model are discussed.			
143	Jordan, Peter A., Campbell, J. Patrick	1997	Trends in winter browse resources used by the moose of Isle Royale; abstracts published for the International Moose Symposium, Fairbanks, Alaska	ISRO
	no abstract available			
144	Jordan, Peter A.; Kenner, Brian	1994	Moose-vegetation relationships based on island-wide plot data. Abstract: Lake Superior National Parks research conference	ISRO
	Data collected to determine the effect moose browsing has had on the vegetation at Isle Royale National Park are summarized. Possible future studies using new technologies are also discussed.			
145	Jordan, Peter A., Martin, F. B.	1978	A new approach to browse sampling and its application for moose at Isle Royale; proceedings of the North American moose conference and workshop	ISRO
	no abstract available			
146	Jordan, Peter A., Wolfe, Michael L.	1979	Aerial and pellet-count inventory of moose at Isle Royale	ISRO
	During 1964-79 Isle Royale moose (*Alces alces*) were inventoried seven winters from the air, and were annually estimated by pellet counts and systematic coverage is recommended for Isle Royale. A small-plot, intensive-searching, stratified procedure was developed for small-airplane use; estimated sighting success over conifer-hardwood forests was 84%. This procedure is described in great detail in the report. The authors recommend counting when moose are least likely to be on non-visible ground or prior to mid to late winter when snow deepens and becomes crusted. A point estimate from the best aerial count (1969) combined with pellet-count trends generated best estimates: 1224 or 2.2/km2 preparturition (15 years), among the highest known for year-round residency. Trends suggested a substantial increase during 1964-68, then a decline in the mid or late 1970's. Defecation rate, using winter-pellet groups, was calculated as 20.9 groups/day, but it needs to be determined experimentally. This report was published in 1980 in Proceedings of the 2nd Annual Conference on Scientific Research in National parks, U. S. National Park Service, Volume 12, pp. 363-393.			
147	Jordan, Peter A., Wolfe, Michael L.	1979	Numbers of moose at Isle Royale; proceedings of the second conference on scientific research in the National Parks, San Francisco, California, November, 1979	ISRO
	no abstract available			
148	Jordan, Peter A., Wolfe, Michael L.	1980	Aerial and pellet-count inventory of moose at Isle Royale; proceedings of the second conference on scientific research in the National Parks	ISRO
	no abstract available			
149	Karns, Patrick D.	1983	Twenty-plus years of aerial moose census in Minnesota; Alces	VOYA
	"Aerial moose censuses have been conducted in Minnesota using plot systems from 1959 to 1981. Stratification and optimal allocation of plots has increased the census precision, but accuracy is somewhat questionable, especially in the northeast where the cover is largely boreal forest. Despite limitations imposed by the technique, the data has played an important role in moose population management." (Abstract by author) Article provides census information on moose located in areas directly adjacent to Voyageurs National Park.			

150	Karns, P.D., Jordan, Peter A.	1969	Pneumostrongylus tenuis in moose on a deer-free island; The Journal of Wildlife Management	ISRO
	Analysis of fresh moose (*Alces alces*) feces from Isle Royale, Michigan, a deer-free island in Lake Superior, and northeastern Minnesota, an area with a low white-tailed deer (*Odocoileus virginianus*) population, revealed incidences of 0.8 and 0.6 percent respectively of the first-stage larva of Pneumostrongylus tenuis, the etiological agent of cerebrospinal nematodiasis in moose. The report of this parasite is from an area (Isle Royale) that has been deer-free for 30 years.			
151	Krefting, Laurits W.	1946	Isle Royale summer moose browse survey, 1946 Progress Report	ISRO
	no abstract available			
152	Krefting, Laurits W., Lee, Forrest B.	1948	Progress report, moose browse investigations on Isle Royale National Park, May 1948	ISRO
	no abstract available			
153	Krefting, Laurits W.	1949	Progress report, observations on the moose of Isle Royale National Park, May 16-June 5, 1949	ISRO
	Observations made at Isle Royale in the fall of 1949 to obtain information on the fall condition of the moose range, to observe moose behavior during the rut, and to secure additional data on moose mortality during the previous winter.			
154	Krefting, Laurits W.	1950	Progress report: observations on the moose of Isle Royale National Park, September 17-25, 1949	ISRO
	Written at a time when the moose population peaking at Isle Royale, this report describes the fall condition of the moose range, moose rutting behavior, and presents data on moose mortality during the past winter. Also reports on the presence of mink, sharptailed grouse, coyote, and snowshoe hares.			
155	Krefting, Laurits W.	1951	What is the future of the Isle Royale moose herd?; transactions of the North American Wildlife Conference	ISRO
	no abstract available			
156	Krefting, Laurits W.	1956	Special report - field trip to Isle Royale, Michigan, July 10-17, 1956	ISRO
	A trip report which contains observations on the condition of the moose range (vegetation), moose exclosure survey results, and the timber wolf-moose relationships.			
157	Krefting, Laurits W.	1968	Progress report: ecology of the Isle Royale moose range 1944-1967	ISRO
	Major objectives of this long-term research project were: first, to appraise the status of the winter range on Isle Royale at periodic intervals; second, to determine the food habits of the moose; third, to measure moose use in various forest cover types; fourth, to determine trends of the moose population; and fifth, to measure the effects of browsing on tree and shrub growth. In the conclusion of this report, Mr. Krefting recommends the use of prescribed burning to maintain a desirable habitat for a moose herd of reasonable numbers.			
158	Krefting, Laurits W.	1968	Progress report: Isle Royale moose exclosure project: Daisy Farm, Siskiwit Camp, Siskiwit Lake, Windigo, 1948-1967	ISRO
	The three major objectives of the moose exclosure project were: 1) to measure the effect of moose browsing in general on the growth and survival of trees and shrubs at key locations; 2) to determine the long term effects of browsing on certain key browse species such as balsam fir, American yew, mountain ash, willow, aspen, and white birch; 3) to measure the long term effects of moose browsing on forest succession such as the 1936 burn area, the aspen-birch-conifer type, and the spruce-fir-birch climax. This progress report describes the results obtains through 1967 at the four exclosure sites. The data have been subjected to preliminary statistical checks, but the findings must be regarded as tentative. This report contains photographs of the moose exclosure sites as they looked when the exclosures were built.			

159	Krefting, Laurits W.	1974	The ecology of the Isle Royale moose with special reference to the habitat; Technical Bulletin #297 - 1974, Forestry Series 15	ISRO
	Describes the 26 year study of moose and their habitat began in 1944. Research included only winter range requirements, however, the importance of spring, summer and fall ranges was recognized. Moose exclosures were established to measure long term effects of winter browsing on survival and growth of trees and shrubs. Describes factors affecting the moose range, home range of the moose, moose distribution and habitat selection, moose mortality, moose productivity, moose in the Isle Royale ecosystem and management implications. This paper contains a section on extinct mammals at Isle Royale. Species included are the redbacked vole, coyote, marten, lynx, and woodland caribou.			
160	Krefting, Laurits W.	1974	Moose distribution and habitat selection in North-Central North America; le Naturaliste Canadien	ISRO
	no abstract available			
161	Lammie, Sam R.	1993	1991 winter moose range Voyageurs National Park	VOYA
	This Voyageurs National Park map for 1991 includes winter moose range and moose tracks/moose sightings. Point location database in ArcView GIS available from the VNP GIS Specialist.			
162	Lammie, Sam R.	1993	1991 and 1992 winter moose ranges Voyageurs National Park	VOYA
	This Voyageurs National Park map for 1991 and 1992 includes winter moose range. Point location database in ArcView GIS available from the VNP GIS Specialist.			
163	Lammie, Sam R.	1993	1992 winter moose range Voyageurs National Park	VOYA
	This Voyageurs National Park map for 1992 includes winter moose range and moose tracks/moose sightings. Point location database in ArcView GIS available from the VNP GIS Specialist.			
164	Lenarz, Mark S.	1987	1986-87 aerial moose survey results	VOYA
	Aerial surveys for moose were conducted by the Minnesota Department of Natural Resources on three areas in Minnesota during the winter of 1986-87. One of these areas, the Northeast (NE) includes the Superior National Forest which is directly adjacent to lands within Voyageurs National Park. Survey methods followed those of Gasaway et al. (1986). Discussions of the findings are included for each of the three areas surveyed. Numbers of moose, their approximate ages, and sex if possible were recorded during the surveys.			
165	Lenarz, Mark S.	1997	1996-97 aerial moose survey results	VOYA
	Aerial surveys were conducted during the winter of 1996-97 to estimate moose numbers in the Northeast and the Northwest Prairie survey areas. Because of reduced moose numbers, the Northwest Prairie East and West survey areas, were combined into a single area for the year's survey. The survey protocol was based on Gasaway et al. (1986) and moose was sexed using the presence of antlers and/or vulval patch. Calves were identified on the basis of size. Estimated moose numbers in northeastern Minnesota were at the lowest point since 1990-91; however this estimate was most likely biased low. Using only data collected prior to January 15, the estimated moose population was 5440. Recruitment was estimated at 49 calves/100 cows. Unlike the population estimate, recruitment is probably less biased. Twin calves were very uncommon in this year's survey; only 1 cow was accompanied by twins. Moose numbers in northwestern Minnesota, as estimated by the 1996-97 aerial survey, totaled 1170 and this estimate is the lowest in recent history. Recruitment remained high at 80 calves/100 cows and twin calves were again relatively common (11% of the cows).			
166	Lenarz, Mark S.	1999	1998-99 aerial moose survey results	VOYA
	Aerial surveys were conducted during January and February 1999 to estimate moose numbers in the Northeast, the Northwest Prairie, and the Northwest Forest survey areas. As in past years, a stratified random block survey protocol originally developed in Alaska to estimate moose population parameters was used (Gasaway et al. 1986). In the Northeast and Northwest Prairie, survey maps were created using GIS and USGS topographic maps. For the Northeast, a total of 271 moose were located on 27 plots: 114 bulls, 81 cows, 51 calves, and 30 unidentified moose. Based on this observed density, the estimated population was 4150 plus or minus 1403 moose. The survey estimated ratios of 57 calves/100 cows and 134 bulls/100 cows. For the Northwest Prairie a total of 114 moose were located on 24 plots (319 mi2) and included 52 bulls, 40 cows, 20 calves, and 2 unidentified moose. The estimated population was 1160 plus or minus 384 moose. The survey estimated ratios of 48 calves/100 cows and 129 bulls/100 cows. A total of only 2 moose were located in 24 plots in the Northwest Forest and included 1 bull and 1 cow. The estimated population was 11 plus or minus 8 moose.			

167	Lenarz, Mark S.	2001	2000-2001 aerial moose survey results	VOYA
	Aerial surveys were conducted during January 2001 to estimate moose numbers in the Northeast and Northwest Prairie survey areas. A stratified random block survey protocol originally developed in Alaska to estimate moose population parameters was used. Maps were created using GIS software and USGS topographic maps. In both areas, moose were sexed using the presence of antlers and/or vulval patch (Mitchell 1970) and calves were identified on the basis of size. UTM coordinates for all moose observed within plots were recorded. In the Northeast, a total of 329 moose were located on 30 plots (424 mi2) and included 108 bulls, 96 cows, 64 calves, and 61 unidentified moose. Based on moose density observed, the total Northeast estimated population was 3879 plus or minus 1094 moose. The survey estimated ratios of 61 calves/100 cows and 105 bulls/100 cows. For the Northwest Prairie, a total of 116 moose were located on 28 plots (377 mi2) and included 56 bulls, 34 cows, 16 calves, and 10 unidentified moose. The estimated population in the Northwest Prairie was 883 plus or minus 253 moose. The survey estimated ratios of 48 calves/100 cows and 165 bulls/100 cows.			
168	Lenarz, Mark S.	2000	1999-2000 aerial moose survey results	VOYA
	Aerial surveys were conducted during January and February 2000 to estimate moose numbers in the Northeast and Northwest Prairie survey areas. A stratified random block survey protocol originally developed in Alaska to estimate moose population parameters was used. In both survey areas maps were created using GIS software and USGS topographic maps. In both areas, moose were sexed using the presence of antlers and/or vulval patch (Mitchell 1970) and calves were identified on the basis of size. UTM coordinates for all moose observed within plots were recorded. For the Northeast, a total of 405 moose were located on 31 plots and included 166 bulls, 109 cows, 65 calves, and 65 unidentified moose. Based on moose density, the estimated population was 3733 plus or minus 942 moose. The survey estimated ratios of 70 calves/100 cows and 134 bulls/100 cows. On the Northwest Prairie, a total of only 70 moose were located on 27 plots (357 mi2) and included 25 bulls, 21 cows, 10 calves, and 14 unidentified moose. The estimated population was 560 plus or minus 233 moose. The survey estimated ratios of 48 calves/100 cows and 118 bulls/100 cows.			
169	Lenarz, Mark S.	2002	2001-2002 aerial moose survey results	VOYA
	Aerial surveys were conducted during January 2002 to estimate moose numbers in northeastern Minnesota. Surveys were planned, but not conducted in the Northwest Prairie and Northwest Forest because of insufficient snow. A stratified random block survey protocol originally developed in Alaska to estimate moose population parameters was used (Gasaway et al. 1986). Maps were created using Geographic Information System software and USGS topographic maps. Moose were sexed using the presence of antlers and/or vulval patch (Mitchell 1970) and calves were identified on the basis of size. UTM coordinates for all moose observed within plots were recorded. In the Northeast, a total of 431 moose were located on 33 plots (503 mi2) and included 137 bulls, 116 cows, 107 calves, and 71 unidentified moose. Based on observed moose density, the total Northeast estimated population was 5214 plus or minus 1199 moose. The survey estimated ratios of 93 calves/100 cows and 122 bulls/100 cows.			
170	Linn, Robert M.	1956	Memorandum report to superintendent, Isle Royale National Park from park naturalist regarding analysis of the current moose-wolf relationship in Isle Royale National Park	ISRO
	Summarizes the attempt to plant wolves on Isle Royale in 1952, presents the most recent information available for that time on the presence of wild wolves on Isle Royale that migrated from Canada over the winter ice on Lake Superior. Discusses information learned concerning moose effects on vegetation and wolf predation on moose.			
171	Linn, Robert M.	1956	Wildlife observations on Isle Royale, February and March, 1956	ISRO
	Reports on wildlife observations and wildlife behavior observations in five areas of the island accessible from Camp Siskiwit. The areas visited are mature black spruce-cedar swamps, mature white birch forest, 20-year successional change forest (1936 burn), and sugar maple-yellow birch climax forest. Primarily reports on observations of moose and wolves and the condition of the vegetation in each area. Moose and wolf populations are estimated. Sharp-tailed grouse were seen in the 20-year successional forest. Wolves were observed stalking the sharptails near Feldtmann Ridge.			
172	Lutzke, J.	1984	It's a Royale place; Michigan Natural Resources	ISRO
	A magazine article describing Rolf Peterson's personal observations of wolves, moose and fox during the annual winter study and humorous stories relating to the winter living conditions on the island as well as the intelligence of the animals.			
173	Martin, Christian J.	1989	Observation of female moose, *Alces alces* , accompanied by possible quadruplet calves at Isle Royale National Park, Michigan; the Canadian Field-Naturalist	ISRO
	A female Moose (*Alces alces*) with possible quadruplet calves, observed and photographed on 4 July 1988 at Isle Royale National Park, Michigan, represents the first North American report of four calves accompanying one cow. A color photograph of the four calves accompanies the report copy found in the Natural Resources specialist office			

174	Martin, Terrance J.	1989	Letter to Dr Mark Lynott, National Park Service, Midwest Archaeological Center, Lincoln, NE	ISRO
	This letter reports changes Mr. Martin is making in his report, "Animal Remains from Archaeological Sites at Isle Royale National Park, Michigan: 1987 Season", primarily concerning the identification of moose and/or caribou bones.			
176	Mcinnes, Pamela, Naiman, Robert J., Pastor, J., Cohen, Yosef	no date	Use of exclosures for browsing studies on Isle Royale: are they representative of the landscape?; Canadian Journal of Botany (submitted)	ISRO
	no abstract available			
177	McLaren, B.	no date	Moose nutritional changes and possible effects on the Isle Royale population	ISRO, VOYA
	A better understanding of historic changes to understory balsam fir on Isle Royale National Park has been gained through stem analysis, artificial browsing experiments, stand surveys, and manipulation of seed germination under a variety of canopy openings. The premise that fir sapling regeneration will never occur at moose densities recorded in the Park over the past 37 years is unjustified.			
178	Mclaren, Brian E.	1996	Plant-specific response to herbivory: simulated browsing of suppressed balsam fir on Isle Royale; Ecology	ISRO
	Balsam fir is a shade-tolerant conifer that experiences growth suppression from browsing of mixed, boreal-type forests of Isle Royale where it forms and important component of moose diet in winter. Suppression increases with increasing canopy cover and forest age. However, response to an individual, severe browsing episode cannot be generalized in terms of suppression, and are best examined by aretificial removal of foliage from understory balsam fir showed that damage such as reduced terminal growth and complete mortality was actually highest among least suppressed trees. Canopy cover produced a secondary effect, in which trees experiencing >60% cover were unable to compensate for removal by clipping. By the second growing season following clipping, surviving clipped trees even in the most damaged sites resumed the same growth as controls. Over the long term, suppression may be a means by which fir remains alive when subjected to continuous browsing. Over the shorter term, delayed growth recovery following severe browsing in an unsuppressed understory may also contribute to sustainability in Isle Royale's plant-herbivore system.			
179	McLaren, Brian E., Peterson, Rolf O.	1994	Wolves, moose, and tree rings on Isle Royale; Science	ISRO
	Investigation of tree growth in Isle Royale National Park revealed the influence of herbivores and carnivores on plants in an intimately linked food chain. Plant growth rates were regulated by cycles in animal density and responded to annual changes in primary productivity only when released from herbivory by wolf predation. Isle Royale's dendrochronology complements a rich literature on food chain control in aquatic systems, which often supports a trophic cascade model. This study provides evidence of top-down control in a forest ecosystem.			
180	Mclaren, Brian E., Peterson, Rolf O.	1995	Seeing the forest with the trees: using dendrochronology to investigate moose-induced changes to a forest understory; Alces	ISRO
	Dendrochronology is presented as a tool for measuring the changes in woody plant growth caused by moose damage. The isolation of the moose population in Isle Royale and the availability of annual estimates of its density since 1959 allow analysis of the relationship between moose browsing and tree-ring growth records. Whole-stem and increment-core records of balsam fir (*Abies balsamea*), a winter forage tree, mountain ash (*Sorbus americana*), a year-round forage tree, and white spruce (*Picea glauca*), a non-forage tree, and presented and discussed.			
181	Mclaren, Brian	1996	Moose nutritional changes and possible effects on the Isle Royale population. Abstract: proceedings of the Lake Superior National Park research conference	ISRO
	Discusses the changes in moose age, structure, and condition as it relates to the renewal of moose's winter forage species, balsam fir (*Abies balsamea*).			
182	McRoberts, R.E., Mech, L. David, Peterson, Rolf O.	1995	The cumulative effect of consecutive winters' snow depth on moose and deer populations: a defence; Journal of Animal	ISRO
	This is a defense of a study from 1987 (by Mech, McRoberts, Peterson and Page) which presented evidence that moose and deer populations are influenced by the cumulative effect of three winter's snow depths. This was challenged by Messier in 1991 who used different methods with new variables to refute Mech's conclusions.			

183	Mcnamee, Thomas	1982	Trouble in wolf heaven; Audubon	ISRO
	Brief history of the caribou population, the early moose population and the arrival of wolves on Isle Royale. Describes the author's visit to ISRO during the winter study in 1981. Describes reasons for closing the park to visitors during the winter months for the protection of the wolves. Several nice color photos.			
184	Mech, L. David	1959	Studies of the timber wolf in Isle Royale National Park - First Annual Report, 1958-1959	ISRO
	This study is concerned with the ecology of the wolf, including the extent and effect of predation on the moose herd, and limiting factors on the wolf population. Winters are spent on aerial surveys of moose and wolves while summer work includes habitat studies, observations on prey species, and collecting wolf scats to determine summer food habits. Winter aerial surveys put this winter's wolf population at 19 or 20 individuals. The moose population was approximated at 310 animals.			
185	Mech, L. David	1961	Studies of the timber wolf in Isle Royale National Park, third annual report, 1960-61	ISRO
	Describes the findings from the third period of spring and summer field work and the third winter study period, studying the timber wolf and moose of Isle Royale National Park. Interesting summer field observations included a fresh moose kill with many infested with over sixty hydatid cysts, many the size of golf balls. Winter wolf population appears to have remained the same as the past two winter counts, at 21 or possibly 22 animals.			
186	Mech, L. David	1960	Studies of the timber wolf in Isle Royale National Park - second annual report, 1959-1960	ISRO
	The second annual report on a three year study concerned with the ecology of the wolf, including the extent and effect of predation on the moose herd. Summer Field work involved collecting wolf scats for analysis, observing a wolf den, and determining the age of predated moose. Fall field work included aerial surveys to determine the moose calf population. Winter field work involved 185 hours of aerial survey to observe wolves, moose and their interactions and behaviors. In the winter of 1960, at least 19 wolves were present on the island; the moose herd is estimated to be 600 animals.			
187	Mech, L. David	1962	The ecology of the timber wolf (*Canis lupus Linnaeus*) in Isle Royale National Park	ISRO
	The primary objective of this investigation was the appraisal of wolf-moose relationships in Isle Royale National Park primarily through aerial observations, supplemented by spring and summer field work. Wolf pack structure was observed, population measured, and wolf socialization was characterized. The moose were counted and moose carcasses were analyzed for the presence of disease. The primary moose mortality factor was predation by wolves and the moose kill rate was measured as was average daily consumption of moose per wolf. Special effort was made to observe hunts, and accounts are described (in Appendix A). Wolf kills were examined on the ground. Mortality of moose was measured and described.			
188	Mech, L. David	1963	Timber wolf and moose of Isle Royale; (Minnesota) Naturalist	ISRO
	Presents information on the effect of wolves on the moose population at ISRO. Describes the behavior of both species when in the presence of each other and has a good description of the how the wolves "test" a moose prior to an ensuing attack. Asks the question "What is controlling the wolf population?" and reveals that nothing is known in 1963 to adequately answer that question.			
189	Mech, L. David	1965	Isle Royale: laboratory of Lake Superior; National Parks Magazine	ISRO
	Describes the winter studies carried out by a team of scientists from Purdue University to investigate the long-term relationships of wolves and moose.			
190	Mech, L. David	1966	The Wolves of Isle Royale; National Park Service fauna series 7	ISRO
	The published version of the 1963 Ph. D. dissertation. The primary objective of this three year investigation was the appraisal of moose-wolf relationships at Isle Royale National Park. Presents information on the behavior and ecology of the eastern timber wolf and the interaction of wolves and moose. Beginning on page 16 is a chapter called "History of Isle Royale Mammals" describing lynx, caribou, marten, beaver, and other species.			
191	Mech, L. David	1985	How delicate is the balance of nature?; National Wildlife	ISRO
	Describes effects of severe winters on moose calves. Calves that survive severe winters became "stunted" yearlings and two-year-olds. These animals are easy prey to the wolves. Talks about the effect of several severe winters in the early 70s and the how the availability of affected calves increased the wolf population which then crashed as the moose population declined.			

192	Meier, Richard L., Doyle, Jane P.	1965	Simulation of the concept of community in ecological systems: the moose-beaver-wolf-environment system of Isle Royale; Mental health Research Institute Report No 16	ISRO
	Presents information on a computer model to be used in teaching students ecological concepts. A working model based on the Isle Royale moose-wolf-beaver studies was developed.			
193	Merritt, Glen	1965	Oral history interview with Lawrence Rakestraw	ISRO
	p. 3 - Mr. Merritt recalls a story of his father on Isle Royale in the summer of 1874 and the father noticed the trees were just growing up again in Merritt Lane after the prospectors fires. Beginning on page 16 through page 18, Mr. Merritt tells of the wildlife he had seen on Isle Royale - stories of caribou, coyotes, moose, lynx, mink, beaver.			
194	Messier, Francois	1991	The significance of limiting and regulating factors on the demography of moose and white-tailed deer; Journal of Animal Ecology	ISRO
	Uses long-term data on the demography of moose (*Alces alces*) on Isle Royale and white-tailed deer (*Odocoileus virginianus*) in the Superior National Forest, north-eastern Minnesota and assesses the contribution of food competition, wolf predation, and snow accumulation as limiting or regulating factors in creating year-to-year variations in animal abundance, or in generating density dependence. Wolf predation and food competition explained 80% of the interannual variation of moose abundance. Snow accumulation had no quantifiable effect on moose numbers. Competition for food, but not wolf predation and snow, had a regulatory impact on moose. Significant inverse relationships were found between deer population growth and relative wolf density, as well as with deer density. Snow had no measurable effect on deer numbers, possibly because of extremely low deer densities and the predominant impact of wolf predation. A previous suggestion that snow accumulation during consecutive winters creates a cumulative impact on the nutritional status of deer and moose was not supported.			
195	Messier, F., Crete, M.	1985	Moose-wolf dynamics and the natural regulation of moose populations; Oecologia	ISRO
	no abstract available			
196	Minzey, Terry R.	1989	Winter bedding habitat characteristics of moose (*Alces alces*) in Michigan	PIRO
	Woody vegetation and physical features of moose winter bedding sites in Baraga and Marquette Counties, MI were analyzed for qualities that might enhance survival of population introduced from Canada. Four adult male moose and 3 adult females and their calves were tracked from December 1987 through March 1988. Data about species of woody vegetation, density of woody vegetation, canopy cover, snow depth, snow compaction, bed depth, bed size, slope, and wind speed and direction were gathered at bedding sites, control sites, and random sites. The point quarter method of vegetation analysis was used, and % frequency, % density, and % dominance were calculated for each species at all bedding sites and all control sites. Management suggestions address retaining or enhancing winter bedding habitat for moose. They include preserving small stands of hemlock near northern hardwoods dominated by sugar maple for browse and shelter, preserving dense stands of balsam fir for browse and shelter primarily for bulls, selectively cutting stands of sugar maple to maintain continuous browse, and limiting each clear cut to 32 ha or less.			
197	Miquelle, Dale G.	1979	The importance of diversity in the diet of moose	ISRO
	Moose (*Alces alces*) include a variety of plant species in their diet but it is not known if the selection for diversity is a basic feeding strategy or if it reflects a scarcity of the most preferred species. To determine preferences when preferred species are not limited in availability, captive moose were offered browse species that were commonly utilized in the field. While showing distinct preferences, the experimental animals did not select a nonotypic diet. Vegetation analysis and direct observations on moose at Isle Royale National Park revealed that given the availability of browse there and the area covered while feeding, animals could fulfill their quantitative needs by feeding on one preferred species; however, they selected for more than one species, suggesting that diversity was an objective. Speculation on the relationship between availability of various species and optimal diet selection are made.			
198	Miquelle, Dale G.	1983	Browse regrowth and consumption following summer defoliation by moose; Journal of Wildlife Management	ISRO
	Foliage regeneration response of woody browse species to defoliation and the consumption of subsequent regrowth by moose (*Alces alces*) was studied at 3 sites on Ise Royale, Michigan. Mountain maple (*Acer spicatum*), American mountain-ash (*Sorbus americana*), paper birch (*Betula papyrifera*), and yellow birch (*Betula alleghaniensis*) were the primary species considered. Regrowth foliage was relatively uncommon on the study sites and comprised less than 1% of the summer diet of moose. Regrowth was avoided by moose, apparently because its weight per bite was significantly less than that of primary foliage, making it less efficient to ingest. Regrowth may be an important mechanism by which browse plants lessen the impact of herbivory.			

199	Miquelle, Dale G.	1983	Summer defecation-urination rates and volumes of moose; Journal of Wildlife Management	ISRO
	Measurements of fecal and urine out-put are necessary elements in constructing baseline physiological profiles of wild ungulates. This paper gives quantitative estimates of excretion rates and volumes, and provides statistical comparisons for age-classes and captive and free-ranging (Isle Royale) moose (*Alces alces*).			
200	Miquelle, Dale G.	1986	Rutting behavior of moose in Isle Royale National Park	ISRO
	Provides information on the mating behavior of moose at ISRO by direct observation and by following known radio-collared moose. Includes interactions between bulls, interactions between bulls and cows, and the use of rutting pits by all ages and sexes of moose. Includes moose vocalizations during the rut and suggestions for "surviving" human-moose encounters during the rutting season.			
201	Miquelle, Dale G., Jordan, Peter A.	1980	The importance of diversity in the diet of a moose; proceedings of the North American moose conference and workshop	ISRO
	The array of plant species eaten by moose (*Alces alces*) has been documented; whether their dietary diversity reflects a basic feeding strategy or simply a scarcity of preferred species has not been tested. Closely observed moose on Isle Royale in summer consumed a number of species during each period of sustained feeding. Vegetation analysis revealed that, given the availability of browse, moose could fulfill their quantitative needs at Isle Royale by feeding on one preferred species, however, they selected for more than one species, suggesting that diversity was the objective.			
202	Moen, Ron	1992	Effects of plant distribution and season on moose foraging	ISRO
	no abstract available			
203	Moen, Ron, Cohen, Yosef, Pastor, John	no date	Linking moose population and plant growth models with a moose energetic model; Ecosystems	ISRO
	no abstract available			
204	Moen, Ron, Pastor, John, Cohen, Yosef	1990	Effects of beaver and moose on the vegetation of Isle Royale National Park; Alces	ISRO
	Studied the cumulative effect of browsing by moose and tree-cutting by beaver on tree density, basal area, and species composition on the northeastern end of Isle Royale National Park. Beaver-effected land (abandoned ponds, occupied ponds, and foraging areas in one representative area increased. Beaver decreased aspen density and basal area adjacent to ponds and streams. Balsam fir tree density was greater in beaver-cut areas than in uncut forest. Moose browsed preferentially on aspen in the summer and winter in both beaver-cut areas and uncut forest. Moose neither preferred nor avoided balsam fir in the beaver-cut area, but avoided it in the uncut forest. White spruce was not browsed. The density of coniferous species with diameter at breast height <15 cm was greater than 400 stems/ha, while stem densities of the heavily browsed deciduous species were less than 20 stems/ha in both beaver-cut areas and uncut forest. Changes in plant species composition affected by moose and beaver populations may decrease soil fertility and alter successional patterns in stream side areas and adjacent forests.			
205	Moen, Ron, Pastor, John, Cohen, Yosef	1996	Interpreting behavior from activity counters in GPS collars on moose; Alces	VOYA
	Activity patterns of free-ranging moose can be estimated from activity counts on radiotelemetry collar. A collared moose was observed to calibrate activity counts on a collar to activities of moose in natural habitats. Activity counts from collars on 6 free-ranging moose were analyzed in 1995. Activity counts were lower from collars on free-ranging moose than from direct observations because collars were placed higher and tighter on the neck. There were cyclic periods of activity and inactivity throughout a 24-hour period when activity counts were taken every 10 minutes on free-ranging moose. Activity counts taken on 10-minute intervals were averaged to simulate GPS observation intervals of 1 to 4 hours typically used in this GPS collar. Moose activity counts averaged over periods longer than 1 hour should be used with caution. (Excerpts from author's abstract)			
206	Moen, Ron, Pastor, John, Cohen, Yosef	1997	A spatially explicit model of moose foraging and energetics; Ecology	ISRO, VOYA
	Herbivores contend with spatial and temporal variation in the quality, quantity, and availability of their food resource. The foraging strategy used by an animal affects its daily and annual energy balance. Consequently, foraging strategies and the distribution of food in the landscape can affect individual fitness and population growth through their effects on the energy balance of reproductive females. The authors have developed an energy and activity simulation environment (EASE) model that predicts the seasonal changes in energy requirements of a female moose (*Alces alces*) foraging in a spatially explicit landscape with a resolution of 1m2. They validated EASE for both moose and deer (*Odocoileus* spp.) with respect to body mass changes reported for feeding trials, activity times, and browse intake rates.			

207	Moen, Ron, Peterson, Rolf	2003	Effects of moose on fuel load in Isle Royale National Park forests; Western Great Lakes research conference and Chequamegon Bay area natural resource conference: Abstracts	ISRO
	FIRELINK, a gap model derived from LINKAGES, was used to simulate forest cover types on Isle Royale. Predictions were compared to measurements of basal area, stem density, and fuel loading in stands with and without moose browsing. Fuel loads were modeled from the early 1900s to 2050.			
208	Moll, Don	1976	Moose triplets on Isle Royale; Illinois Acad Sci Trans	ISRO
	no abstract available			
210	Mulville, Diane	1987	1986 moose exclosure update Isle Royale National Park Resource Management Report 87-2	ISRO
	Four moose exclosures were built at key locations in 1948 to assist in evaluating long term effects of moose browsing on the survival and growth of certain important browse specis and on forest succession. Krefting's vegetation study was repeated in July 1986 on the Daisy Farm exclosure and control plots. The higher growth rate of species on the exclosure plot indicates that vegetation protected from moose browsing is moving along the successional time-line at a much faster rate. A comparison of mean tree heights from 1949 to 1986, supports the hypothesis that moose browsing has retarded growth of control plot trees.			
212	Murie, Adolph	1934	The moose of Isle Royale; University of Michigan, Museum of Zoology, Miscellaneous Publications No 25	ISRO
	Results of a 1929 survey of Isle Royale National Park regarding the moose present on the island and the moose population boom-or-bust. Describes the habits and behaviors of the species as well as their food habits and the condition of the food plants on the island. An annotated list of food plants is given.			
213	National Park Service	1982	A general review of the wolf and moose program in Isle Royale National Park	ISRO
	Discusses the wolf/moose monitoring program at Isle Royale in terms of the Monitoring and Research Applications, Ecological History of the two species, Management Implications, Scientific Implications, and Project Administration. The value of long-term monitoring is stressed, given the changing interpretation of wolf and moose population data which have been collected during the 24 years of this project. The next five years of research and monitoring will permit the testing of the ideas that the wolf-moose interaction is best characterized as a predator-prey cycle, that body size is a key ecological consideration which explains the long lag times in wolf-moose population responses, and that a cycle period of 30 years exists for these responses.			
214	Natural Resources Research Institute	1991	1989 moose pellet groups	VOYA
	This is a 1 page map of the 1989 moose pellet groups for Voyageurs National Park.			
215	Natural Resources Research Institute	1991	Total moose pellet groups	VOYA
	This map of Voyageurs National Park is the total moose pellet count for 1989 and 1991. The attached 6 page topographic map information is titled "# moose pellet groups 89/91 as an indicator of winter dist."			
216	Natural Resources Research Institute	1991	1991 moose pellet groups	VOYA
	This is a 1 page map of the 1992 moose pellet groups at Voyageurs National Park.			
217	Oelfke, Jack G., Peterson, Rolf	1994	Wolf/moose update, ISRO (sent for inclusion into Spring 1994 Park Science)	ISRO
	A summary of results from the 36th annual (1994) wolf/moose winter monitoring program at Isle Royale National Park. Population counts showed 17 wolves and 1900 moose. An ice bridge to Canada and Minnesota's north shore formed during this severely cold winter.			

218	Olexa, Edward M., Gogan, Peter J.P.	1991	A preliminary aerial block census of moose at Voyageurs National Park, Winter 1991	VOYA
	Annual moose censuses have been conducted in Voyageurs National Park between 1982 and 1987 and again in 1989 using aerial "strip counts". This report presents the results of these censuses and discusses the limitations of this censusing method. In 1991, a new block census method was tested and found to be more appropriate. Results from 1991 surveys and a discussion of the new block method is presented.			
219	Page, Richard E.	1989	The inverted pyramid: ecosystem dynamics of wolves and moose on Isle Royale	ISRO
	Analyzes the dynamics of wolf and moose populations including vegetation supply and the affect each has on the population of another.			
220	Pastor, John	1989	Of moose and spruce: what do interactions of plant and animal life tell us about the future of Isle Royale National Park?; Natural Resources Research Institute Now	ISRO
	Discusses the impact of moose browsing on the vegetation of Isle Royale.			
221	Pastor, John Joseph	1990	1990 investigators annual report - effects of moose browsing on the dynamics of northern ecosystems	ISRO
	The objective of this study is to determine the effects of selective foraging on the dynamics and spatial pattern of vegetation, soil fertility, and seed bank dynamics. Two hundred points were established in the northeast sector of Isle Royale. Vegetation composition, browsing intensity, seed bank dynamics, and soil nitrogen availability at each point was measured. Significant findings are described.			
222	Pastor, John, Dewey, Brad, Moen, R., Cohen, Yosef, White, M., Mladenoff, D.	1995	The moose-Isle Royale ecosystem as a harmonic oscillator; Oikos	ISRO
	no abstract available			
223	Pastor, John, Dewey, Brad, Moen, Ronald, Mladenoff, D.J., White, M., Cohen, Yosef	1996	The moose-Isle Royale ecosystem as a spatially harmonic oscillator; Oecologia	ISRO
	no abstract available			
224	Pastor, John, Dewey, Bradley, Moen, Ronald, Mladenoff, David J., White, Mark, Cohen, Yosef	1997	The moose-Isle Royale ecosystem as a spatially harmonic oscillator (ABSTRACT); Lake Superior National Parks research conference	ISRO
	The effect of moose browsing on vegetation and nitrogen availability are described by equations for harmonic oscillators.			
225	Pastor, J., Dewey, B., Naiman, R.J., McInnes, P.F., Cohen, Y.	1993	Moose browsing and soil fertility in the boreal forests of Isle Royale National Park; Ecology	ISRO
	Selective browsing by moose on hardwoods and avoidance of conifers alters community composition and structure, which in turn can affect nutrient cycles and productivity. The effect of moose browsing on the nutrient cycles of boreal forests was studies using three 40-yr-old exclosures on Isle Royale, Michigan. &. These results suggest that the effects of herbivores on ecosystems may be amplified by positive feedbacks between plant litter and soil nutrient availability.			
226	Pastor, John, Dewey, Brad, Naiman, Robert J., Mcinnes, Pamela F., Cohen, Yosef	1993	Moose browsing and soil fertility in the boreal forests of Isle Royale National Park; Ecology	ISRO
	Selective foraging by moose on hardwoods and avoidance of conifers alters community composition and structure, which in turn can affect nutrient cycles and productivity. The effect of moose browsing on the nutrient cycles of boreal forests was studied using three 40-yr-old exclosures on Isle Royale. The authors conclude, that in the long term, high rates of moose browsing depress nitrogen mineralization and net primary production through the indirect effects on recruitment into the tree stratum, and subsequent depression of litter nitrogen return and litter quality. These results suggest that the effects of herbivores on ecosystems may be amplified by positive feedbacks between plant litter and soil nutrient availability.			

227	Pastor, John, Mladenoff, David L., Cohen, Yosef	1991	Effect of large mammal browsing on the dynamics of northern ecosystems	VOYA
	This is a detailed project proposal to study the effects of moose on boreal landscapes in Voyageurs National Park. Budget proposals, and project clearance forms are also included.			
228	Pastor, John, Naiman, Robert J., Dewey, Brad	1987	A hypothesis of the effects of moose and beaver foraging on soil nitrogen and carbon dynamics, Isle Royale; Alces	ISRO
	Selective foraging by moose (*Alces alces*) and beaver (*Castor canadensis*) alter the species composition of the forests. We hypothesize that this affects the types of litter returned to the soil, soil carbon and nitrogen pools and soil nitrogen availability. Preliminary analyses of soils collected from areas with various combinations of moose and beaver foraging on Isle Royale, Michigan, support this hypothesis. Soil carbon and nitrogen pools and nitrogen availability are significantly greater where beaver cutting of large diameter (> 10 cm) aspen, mountain ash, and other hardwoods maintains their dominance because they sprout prolifically from roots and stumps. These species have easily decomposible litter which increases soil nitrogen availability. In contrast, moose browsing of young hardwoods suppresses their growth, allowing unbrowsed spruce to gain dominance. Spruce litter is low in nitrogen and difficult to decompose. Soil nitrogen pools and nitrogen availability are significantly lower in areas of heavy moose browsing. Because nitrogen is the limiting nutrient in boreal forests, moose and beaver may have long-term effects on ecosystem properties.			
229	Pastor, John, Naiman, Robert J., Dewey, Brad	no date	The effect of moose browsing on soil properties in the boreal forests of Isle Royale; submitted to Ecology	ISRO
	no abstract available			
230	Pastor, John, Naiman, Robert J., Dewey, Brad, Mcinnes, Pamela	1988	Moose, microbes, and the boreal forest; Bioscience	ISRO
	Through selective browsing, moose influences both the plant species present in the forest and the properties of the soil. Discusses the differences found in and around three upland exlosures on Isle Royale concerning plant growth, litter production, and its effect on the soil microorganisms. All changes are most apparent at the Windigo exclosure where moose browsing is highest. When moose browsing causes decreases in both quantity and quality of litter through changes in plant community composition, as seen at the Windigo site, soil microbial processes determining nitrogen availability to plants will also decline.			
231	Peek, J.M.	1974	Initial response of moose to a forest fire in northeastern Minnesota; The American Midland Naturalist	GRPO ISRO VOYA
	Density of moose in northeastern Minnesota increased from less than 0.5 per square mile prior to a large fire to over 2 per square mile two growing seasons following the fire. The increase was related to immigration, especially of yearlings, rather than to increased production and survival of calves.			
259	Peterson, Rolf O.	no date	Osteoarthritis and early malnutrition in moose and man; Submitted to Journal of Wildlife Diseases	ISRO
	no abstract available			
260	Peterson, Rolf O.	no date	Moose bones	ISRO
	A large collection of moose bones and antlers from Isle Royale moose are stored at Michigan Technological University.			
232	Peterson, Rolf O.	1973	Ecological studies of the wolf on Isle Royale - summer field work, 1973	ISRO
	Discusses findings of 1973 summer field season regarding specimens collected from wolf-killed moose located during winter study 1973. A significant number of young adults were killed by wolves in the winter of 1973, supporting the hypothesis that severe winters may have an adverse effect on life expectancy of calves born before or after such a winter. All moose remains encountered during summer field work were also examined. Moose observations showed that calf production was higher in 1973 than in the previous three years, probably due to the unusually mild winter of 1973. One wolf pack was monitored using howling responses and by direct observation at one of four rendezvous areas. Seven healthy pups were observed with this pack. Wolf scat was collected and analyzed. The increase in beaver density in recent years appears to have been accompanied by an increase in wolf utilization of beaver.			
233	Peterson, Rolf O.	1974	Moose-wolf ecology on Isle Royale	ISRO
	A summary of the wolf and moose populations as they existed in 1974, prepared for the introductory training of ISRO seasonal staff in that year. Includes a description of moose-wolf relationships in general with more detailed descriptions of the moose population and the wolf population and variables affecting each.			

234	Peterson, Rolf O.	1975	Wolf response to increased moose vulnerability on Isle Royale; proceedings of the 11th North American moose conference, Winnipeg, Manitoba, Canada	ISRO
	ALSO REFERRED TO AS: Journal paper No. 5877 of the Purdue University Agricultural Experiment Station. Ecological studies of wolves and moose in Isle Royale National Park have been conducted on a yearly basis since 1959. Since that period moose productivity has declined and there is increased evidence of winter nutritional stress, increased winter severity, and an increase in the moose population during the 1960s. Among wolf-kills the incidence of moose between one and six year old increased since 1970. This major increase in vulnerability of young moose appears to have been caused by malnutrition early in life. From the late 1960s to early 1970s kill rates have been generally high with carcasses underutilized, and in 1972 a second large pack of wolves became firmly established, for the first time. In 1975, a third pack appeared and the wolf population reached a historic high 41 wolves. Wolf predation continues to be the principal mortality factor, but the degree to which it operates is determined by moose vulnerability, with long-term levels of the moose population governed basically by food availability.			
235	Peterson, Rolf O.	1976	Wolves and moose on Isle Royale - 1976 status	ISRO
	Presents history of moose and wolf colonization of Isle Royale along with a general discussion of wolf-moose relationships. Recent trends in the wolf and moose populations are presented along with a description of ways in which visitors to Isle Royale can voluntarily assist the wolf-moose studies.			
236	Peterson, Rolf O.	1976	Wolf survey in Voyageurs National Park	VOYA
	During the period from December 29, 1975 to January 4, 1976, aerial surveys for eastern timber wolves in Voyageurs National Park were conducted. No wolves were sighted and track counts were difficult due to the large number of deer/moose tracks. A rough estimate of 25-30 wolves was arrived at through track counts and sightings provided by private citizens. The bulk of this report appears to be data on white-tailed deer and moose surveys.			
237	Peterson, Rolf O.	1977	Management implication of wolf-moose research, Isle Royale National Park, Michigan	ISRO
	This report broadly summarizes all aspects of the Isle Royale wolf-moose research program and findings to date (1977), some 19 years in duration. The report discusses the kind of research being completed and the rationale for it, including the winter and summer wolf research, and moose research. Of particular relevance to park management are the discussions of impacts to wolves from various visitor/management activities, including visitor effects on wolves in the summer, the potential impacts on wolf activity of adding new campgrounds, winter use of the park by visitors, fire management, and additional trail development. The rationale for excluding pets from the park, due to concerns of pets introducing new diseases to the island which could cause serious impacts to native animal populations, is also provided.			
238	Peterson, Rolf O.	1979	The role of wolf predation in a moose population decline; proceedings of the 1st conference on scientific research in National Parks USDI NPS Transactions and Proceedings Series Number 5, Volume 1	ISRO
	The moose population of Isle Royale National Park is not hunted and therefore has a diverse age structure. Isle Royale moose were heavily dependent on post-fire forests, but by the 1960s these seral communities had largely grown out of the reach of the moose. Isle Royale experienced a series of severe winters in the early 1970s, and the wolf population was quick to respond to increased moose vulnerability.			
239	Peterson, Rolf O.	1981	An answer to "when are you going to QUIT?"; The George Wright Forum	ISRO
	Discusses the value of and the long-term results of the research following the moose and wolf populations and their relationships on Isle Royale National Park.			
240	Peterson, Rolf O.	1983	Wolf-moose ecology at Isle Royale National Park, progress report on research conducted during May 1 - November 30, 1983	ISRO
	This report covers field work conducted at Isle Royale National Park on wolf-moose ecology during the period May 1 - November 30, 1983. The objectives for the summer field work were to determine the extent of wolf pup production and survival, distribution of summer homesites, and food habits. A second objective was to determine moose calf production, yearling survival, adult moose sex ratio, a summer index to moose density, and characteristics of moose mortality.			

241	Peterson, Rolf O.	1983	Wolf-moose ecology at Isle Royale National Park - final report on research conducted during May 1 - November 30, 1982	ISRO
	Wolf-moose research in summer 1982 at ISRO centered on measuring the reproductive performance of both the moose population (in the early stages of an apparent recovery) and the wolf population (at its lowest level since colonization of the island over 30 years ago). At year's end at least 35% of the moose population was comprised of animals born in 1981 or 1982. All four potentially breeding females in the wolf population bore young, and a minimum of 10 pups were alive midsummer. Also discussed is the distribution of wolf summer home sites and habits; and moose yearling survival, adult moose sex ratio, a summer index to moose density and characteristics of moose mortality.			
242	Peterson, Rolf O.	1992	Ecological studies of wolves on Isle Royale, annual report - 1991-1992	ISRO
	During 1991-92 the Isle Royale wolf population remained at the all-time low of 12 individuals. Two wolf pups were produced in one pack and two wolves died, resulting in no net change in population size. Three territorial packs continued to partition the Island, and an additional breeding pair formed during late February. There was no turnover or mortality among the four male-female pairs from last year. Two additional wolves were radio-collared in 1991; half of the current population has been live-captured and collared since 1988. The number of old moose in the population is now increasing rapidly, so if wolves are food-limited they should increase in number within two years. If not, genetic deterioration will remain as the likely cause for low reproduction. The moose population increased to about 1600 animals in 1992, approaching the highest level in four decades. Calf abundance in mid-winter was moderately high. However, calves were generally small and highly vulnerable to wolves. High wolf predation on calves would limit further growth in the moose population within 2-4 years.			
243	Peterson, Rolf O.	1992	1992 winter study data	ISRO
	Includes Raw data and observations made during the 1992 Winter Study period (January 15 through March 8, 1992) on Isle Royale National Park. Information included is: 1992 Weather Record, Flying Conditions, Dead Moose Map, 1992 Flying Record, Aerial Moose Observations, Autopsy Series, Kill Tally, Wolf Travels and Kills, Wolf Observations, Aerial Locations of Wolves, Scent Marking Frequency, Courtship Behavior, Wolf-Moose Encounters, Observations of other wildlife (Fox, Raven, Otter, Beaver, Eagle) Possible Kills, Snow-Urine, Marrow Fat, Ice Conditions, Wolf Travels, Maps showing locations of wolves on each day of flight time, and Moose Census.			
244	Peterson, Rolf O.	1993	Ecological studies of wolves on Isle Royale, annual report - 1992-1993	ISRO
	During 1992-1993, moose continued to increase and the wolf population remained almost unchanged. The wingle reproducing pack increased to seven members, whereas the other two packs remained at two wolves each. Only one lone wolf survived the recent winter. Three females, one in each pack, were in breeding condition and courted by males in 1993. Only one of these pairs has successfully raised young since 1988, however, and population growth is limited by poor reproduction. In the past five years wolf exposure to canine parvovirus appears to have diminished; there is no evidence that disease is contributing to low reproductive success on Isle Royale. Reduced genetic variability and a high degree of relatedness among the wolves suggest that inbreeding depression has led to an unusually low reproductive rate.			
245	Peterson, Rolf O.	1993	1993 winter study data	ISRO
	Includes raw data and observations made regarding moose and wolf populations during the 1993 Winter study period at Isle Royale National Park. Information included: weather record, flying conditions, flying record, wolf observations, wolf travels and kills, wolf aerial locations, kill tally, map showing location of dead moose, maps showing ice conditions, observations of other wildlife (fox, beaver, otter, eagle), scent marking frequency, courtship behavior, wolf-moose encounters, marrow fat, moose census, moose snow-urine, and a map for each day of flight time showing locations of observed wildlife.			
246	Peterson, Rolf O.	1994	Ecological studies of wolves on Isle Royale: annual report--1993-1994	ISRO
	In 1993-1994 wolf and moose populations at Isle Royale both increased. Wolf numbers reached 17 in January 1994, their highest level since 1987. Two of the three packs reproduced, each raising 4 pups. Eleven of fifteen wolves surviving in March 1994 were young - three years old or less. This younger generation contains both males and females, which will help secure the short-term future of the wolf population. Improved reproduction in the wolf population calls into question the hypothesis that poor reproduction in this small population was caused by inbreeding. Wolf food supply (old moose) began increasing in the early 1990s, and wolves may now finally be responding to improved food supply, in spite of genetic losses. The outcome of the next few years should help resolve this important question. Mortality during the 1994 study included some losses to accidents and malnutrition, but wolves killed 70% of the moose recovered in winter. The moose population will probably continue to grow until it is stopped by increased wolf predation, ticks, or winterkill.			

247	Peterson, Rolf O.	1994	1994 winter study data	ISRO
	Includes raw data and observations on wolf and moose populations during the 1994 Winter Study Period from January 11, 1994, through February 28, 1994. This information includes: weather record, flying conditions, flying record, aerial moose observations, wolf observations, wolf travels and kills, map showing dead moose, aerial locations of collared wolves, kill tally, map showing possible kills, ice conditions, other wildlife observations (fox, otter, beaver, eagle), courtship behavior, wolf-moose encounters, moose snow-urine, genetics collections, marrow fat, a map for each day of flight time showing locations of animals observed, and moose census.			
248	Peterson, Rolf O.	1995	1995 winter study data	ISRO
	Includes raw data and observations on moose and wolf populations at Isle Royale National Park made during the 1995 winter study period from January 15, 1995 through February 27, 1995. Includes weather record, flying conditions, flying record, aerial moose observations, wolf observations, kill tally, wolf travels and kills, map showing locations of dead moose, aerial locations of collared wolves, possible kills, maps showing ice conditions, information on other animal species observed (fox, beaver, otter, eagle), courtship behavior, wolf-moose encounters, moose snow-urine, marrow fat, tissue samples, a map for each day of flight time showing locations of animals observed, and moose census.			
249	Peterson, Rolf O.	1995	Ecological studies of wolves on Isle Royale: annual report--1994-1995	ISRO
	In 1994-95 the wolf population at Isle Royale remained stable, while the moose population increased. Annual wolf mortality was near the long-term average and reproduction fell back to the low levels. Only one of the three territorial packs reproduced, yielding two surviving pups. Isle Royale is now free of important wolf diseases and wolf food supply (old moose) will increase steadily during the 1990s. If the next generation of wolves reproduces at rates similar to the last, then genetic decay will probably remain the only reasonable explanation for low reproduction which is preventing expansion of wolf numbers. Growth of the moose population was furthered by "easy winters" during the past two years. During the 1995 winter study, wolf predation was responsible for almost 90% of the moose mortality we recorded. Tree-ring studies of forest trees heavily browsed by moose have revealed that tree growth in the regenerating forest declined in concert with the moose increase. The ecological significance of top carnivores in terrestrial food chains has probably been underestimated because they have been extirpated or reduced in number by human actions.			
250	Peterson, Rolf O.	1996	Wolves and moose on Isle Royale, winter 1995-1996	ISRO
	Videotape of a slide presentation.			
251	Peterson, Rolf O.	1996	Moose observations (aerial - 1996)	ISRO
	Records aerial moose observations during the 1996 Winter Study period from January 15, 1996 through February 28, 1996. Information recorded includes date, hours flown, number bedded, number standing, total number, number of calves, number of antlered males, percent standing, moose per hour, ticks, and observers initials.			
252	Peterson, Rolf O.	1996	Travels and kills - 1996	ISRO
	Records information pertaining to wolf travels and kills gathered during the 1996 Winter Study period from January 14, 1996 through February 28, 1996. Information recorded includes date, travel, kills covered, location, kill identification number, social ties, and kill coverage (no travel) for each of the three wolf packs.			
253	Peterson, Rolf O.	1996	1996 winter study data	ISRO
	Includes the raw data and observations gathered during the 1996 Winter Study period from January 12, 1996 through February 29, 1996. Information included includes weather records, Flying conditions, flying record, aerial moose observations, wolf observations, wolf travels and kills, map showing dead moose, kill tally, wolf aerial locations, map showing possible kills, maps showing ice conditions, information on other wildlife observed, (fox, beaver, eagles, otter), scent marking frequency, courtship behaviors, wolf/moose confrontations, moose snow-urine, moose marrow fat, and maps for each day of flying showing locations of animals observed, and moose census.			
254	Peterson, Rolf O.	1996	Ecological studies of wolves on Isle Royale: annual report--1995-96	ISRO
	Dramatic changes occurred at Isle Royale in the past year, with wolves increasing to their highest level in over a decade while the moose population crashed from lack of food, a condition exacerbated by winter ticks and severe winter weather. The wolf population included seven pups distributed in all three territorial packs. The first litter of pups born to wolves of the next generation was of normal size, four pups surviving to winter. Three pups survived in the other two territorial packs. Wolf age structure is now dominated by young wolves with high expected survival rates and reproductive potential. In the moose population, low calf survival and retarded body growth in calves, and high loads of winter ticks were already causing hair loss in January, 1996. A severe shortage of winter forage, and the combined impact of these conditions led to the highest moose mortality rate of the past 38 winters. With poor calf production and survival, plus an increasingly old age structure, the moose population should continue to decline.			

255	Peterson, Rolf O.	1997	1997 winter study data	ISRO
	Includes the raw data and observations gathered during the 1997 Winter Study period from January 14, 1997 through March 3, 1997. Information included includes weather records, snow depth records, Flying conditions, flying record, aerial moose observations, moose observed per hour, map showing dead moose, wolf observations, wolf travels and kills, kill tally, wolf aerial locations, map showing possible kills, maps showing ice conditions, information on other wildlife observed, (fox, beaver, eagles, otter, marten), foxes on kills, scent marking frequency, courtship behaviors, wolf/moose encounters, moose snow-urine, final wolf count, wolf notes, moose marrow fat , maps for each day of flying showing locations of animals observed, moose census, and 3-year census results.			
256	Peterson, Rolf O.	1998	Ecological studies of wolves on Isle Royale: annual report - 1997-1998	ISRO
	After several years of steady population increase, the wolf population unexpectedly declined from 24 to 14 individuals. Acute food shortage due to the moose die off in 1996 is likely a cause of the wolf decline. The wolf population contained three territorial packs plus one nonterritorial pair. Most of the moose population on Isle Royale now lives within the territory of one wolf pack. Moose kill rates this past winter were relatively low; wolves killed primarily the moose calves. The wolves took advantage of the warm winter conditions to hunt beaver. The moose population increased to 700 animals. The remains of moose that died in the severe winter of 1996 have been examined and results are reported. This annual report also reports on other wildlife species, including a study of deer mice and observations of red fox, bald eagles, osprey, and pine marten.			
257	Peterson, Rolf O.	1998	1998 winter study data	ISRO
	Includes the raw data and observations gathered during the 1998 Winter Study period from January 13, 1998 through February 21, 1998. Information included: flying record, flying conditions, snow depth, weather record, aerial moose observations, moose seen per hour, otters observations, dead moose, beaver sign, eagle observations, fox observations, ice conditions, wolf observations, wolf travels and kills, kill tally, aerial locations, foxes on kills, scent marking frequency, cow moose with twins, wolf courtship behavior, wolf-moose encounters, final wolf count, wolf notes and descriptions, pine marten observations, marrow fat measurements, moose snow-urine observations, moose census, and a map for each date of flying showing locations of wolf observations and moose kills.			
258	Peterson, R.O.	1999	Wolf-moose interactions on Isle Royale: the end of natural regulation?; Ecological Applications	ISRO
	Long term population fluctuations of wolves and moose in Isle Royale National Park, Michigan, are used to evaluate a central tenet of the natural regulation concept commonly applied by the National Park Service in the United States, namely, that wild cervid population exhibit density dependence which, even in the absence of large predators, will stabilize population growth. This tenet, restated as a hypothesis, is rejected based on moose population response to a chronic wolf decline. The long-standing NPS management tradition of nonintervention may not be compatible with the current policy that stresses maintenance of natural ecological processes, such as a predator-prey system.			
261	Peterson, Rolf O., Allen, Durward L.	1974	Snow conditions as a parameter in moose-wolf relationships; Le Naturaliste Canadien	ISRO
	Increased snow depths on Isle Royale in recent years have emphasized the important influence of snow conditions on moose-wolf (*Alces alces - Canis lupus*) relationships. In spite of a relatively light weight-load-on-track, wolves are hampered by deep snow of low density. However, they often benefit from increased density and crusting conditions associated with mature snow. Moose have a much greater weight-load-on-track, but are aided in snow by their long legs. On Isle Royale, increased snow depths resulted in a concentration of moose in conifer cover along lakeshores, which are primary travel routes for wolves. Reduced availability of forage, a result of lowered mobility in deep snow, brought about a higher incidence of malnutrition, especially in caves, resulting in greater vulnerability to wolf predation. In years of deep snow, wolves have generally increased their kill rate of calves and "prime-age" moose. Information to date suggests that calves surviving a severe winter show greater than normal vulnerability as young adults.			
262	Peterson, Rolf O., Allen, Durward L., Dietz, James M.	1982	Depletion of bone marrow fat in moose and a correction for dehydration; Journal of Wildlife Management	ISRO
	This abstract is written from a draft copy found in the above mentioned file. Bone Marrow fat content is commonly used as an indication of the condition of ungulates. Methods used to determine bone marrow fat content (dry-weight method, percent oven-dry weight, or reagent-dry method) are based on the premise that dehydration of the marrow prior to analysis is negligible. If considerable time has passed before marrow is analyzed, the fat content in such specimens is overestimated. The objective of this study was to develop an equation that can be used to correct for an unknown degree of dehydration prior to collection. They also determined whether marrow fat differences existed among the 6 major leg bones of moose.			

264	Peterson, Rolf O., Bada, J.L., Schoeninger, M.	no date	Detecting environmental change from stable isotope ratios in moose teeth; 6th Conference on Research in the National Parks and equivalent reserves (El Paso, TX, November, 1990); and 52nd Midwest Fish and Wildlife Conference (Minneapolis, MN, December 1990)	ISRO
	no abstract available			
265	Peterson, Rolf O.; Kenner, Brian	1997	Moose crash on Isle Royale; Lake Superior National Parks research conference (ABSTRACT)	ISRO
	In 1996, the moose population crashed on Isle Royale due to limitations of food. Approximately 80% of the population was lost. Prior to the crash, moose numbers had reached an historic high.			
266	Peterson, Rolf O., Morehead, John M.	1980	Isle Royale wolves and National Park Management; IN: proceedings of the 2nd conference on research in National Parks Nat'l tech info serv, Washington, DC	ISRO
	Isle Royale National Park supports one of two well-established populations of eastern timber wolves in the U. S. and has been designated as "critical habitat" for this species. Research over the past 20 years has documented the primary importance of wolf predation in the population dynamics of the Isle Royale moose. A priority goal of park management is to protect wolf activity from human disturbance. Wolves continue to exhibit pronounced avoidance behavior toward humans, even though totally protected during their 30-year history on Isle Royale. Research has documented wolf avoidance of hiking trails during the visitor season and the influence of human activity on the location of wolf dens and rendezvous sites. The influence of wolves on park management is discussed, including park management philosophy, campground and trail development, appropriate backcountry use, research techniques, and park closure during winter.			
267	Peterson, Rolf O., Page, Richard E.	1983	Cyclic fluctuations of wolves and moose on Isle Royale, Michigan, USA; Acta Zoologica Fennica	ISRO
	Studies of wolf and moose populations on Isle Royale National park have continued on an annual basis since 1958. During the 1960s the moose population slowly grew from about 600 to at least 1200, while wolves were fairly stable, averaging 22. After 1969, along with a series of four severe winters, wolf predation increased to a high level and an additional four packs were added with the food surplus. In 1980, the wolf population reached 50; the highest natural density documented. The moose population declined rapidly, remaining low throughout the 1970s until last year. Wolf predation was found to be instrumental in the decline, and the role of wolves in moose population dynamics are discussed.			
268	Peterson, Rolf O., Page, Richard E.	1985	Ecological studies of wolves on Isle Royale final report - 1985)	ISRO
	Describes the 27th annual winter study of wolves and moose on Isle Royale. The wolf population was found to have changed little from 1984. The wolf population of 22 animals remained partitioned into 3 packs, but evidently only 2 reproduced in 1984. The moose population was 1062, a considerable increase over the 1984 estimate. Radio-collared moose were utilized to assess sightability of moose on census plots in 1985.			
269	Peterson, Rolf O., Page, Richard E.	1987	Wolf density as a predictor of predation rate; Swedish wildlife Research	ISRO
	Total loss of moose to wolf population was measured in midwinter from 1975 to 1984 at Isle Royale National Park. This paper presents a preliminary examination of wolf kill rates, focusing on the relationship between wolf predation impact and wolf numbers.			
270	Peterson, Rolf O., Page, Richard E.	1993	Detection of moose in midwinter from fixed-wing aircraft over dense forest cover; Wildlife Society Bulletin	ISRO
	Moose observations from fixed-wing aircraft and trial counts using radio collared moose in ISRO were used to estimate the proportion of moose observed during aerial censuses in midwinter in dense forest habitats. Using an intensive search flight pattern (small overlapping circles) with low-contrast daylight, moose detection from fixed-wing aircraft (78-80%) was comparable to that reported for helicopter counts. Using intensive searches, detection was lowest (70-75%) in coniferous forests, whereas virtually no moose were missed in counts in deciduous habitats. In the absence of trial counts for detection rate during an aerial survey, an assumed rate of 75% is consistent with out results. Ideally, moose counts in winter should be timed to coincide with the period of greatest moose activity, just after sunrise.			

271	Peterson, Rolf O., Page, Richard E., Dodge, Kevin M.	1984	Wolves, moose, and the allometry of population cycles; Science	ISRO
	After a decade of dramatic population fluctuations, protected populations of wolves and moose in Isle Royale National Park returned in 1983 to the levels observed in the 1950s. Inherent time lags in this predator-prey system and the strong recovery of the moose population following a wolf population crash suggest that these populations may continue to cycle with a period length of about 30 years. Such a long-term cycle is consistent with a recent hypothesis that period length of herbivore cycles will characteristically scale according to the fourth root of body mass, a basic allometric relationship linking physiological cycles to population processes.			
274	Peterson, Rolf O., Page, Richard E., Risenhoover, Kenneth L.	no date	Phenotypic variation in lifetime survival of moose under a regime of wolf predation; submitted to Ecology, 5/90	ISRO
	no abstract available			
275	Peterson, Rolf O., Page, Richard E., Risenhoover, Kenneth L.	no date	Wolf predation and phenotypic variation in moose survival: 3-trophic level interactions	ISRO
	no abstract available			
272	Peterson, Rolf O., Page, Richard E., Risenhoover, Kenneth L.	no date	Lifetime survival of moose under a regime of wolf predation; submitted to Ecology, 5/90	ISRO
	no abstract available			
273	Peterson, Rolf O., Page, Richard E., Risenhoover, Kenneth L.	1985	Wolf-moose interaction in Isle Royale National Park -final report for contract CX 6000-3-0049	ISRO
	Summarized here is a twenty-seven year study of wolf and moose populations at Isle Royale National Park, undertaken in 1958 in order to clarify mechanisms of population regulation for this predator-prey system. The titles of the chapters in this manuscript are as follows: 1) Wolf and Moose Research on Isle Royale; 2) The rise and fall of Isle Royale Wolves, 1975-1984 3) The influence of a prey decline on the foraging efficiency of wolves; 4) Wolf avoidance strategies of moose ; 5) Do Wolves alone Limit Moose Population? (a response to a paper written by A. T. Bergerud and others in 1983); 6) The Bottom of the Ladder: Moose-vegetation interaction on Isle Royale (a brief review of the literature on moose-vegetation at Isle Royale, highlighting areas where knowledge is most inadequate); 7) Management Implications. Most of these chapters have been published as papers in professional journals. Appendices are titled: revised life table for Isle Royale moose, raw data files list, and map of Isle Royale.			
276	Peterson, Rolf O., Page, Richard E., Stephens, Philip W.	1982	Ecological studies of wolves on Isle Royale - annual report 1981-1982 (covering the twenty-fourth year of research)	ISRO
	This report summarizes the wolf - moose research on Isle Royale for 1981-1982. In 1982 only 14 wolves remained on the Island; the lowest level documented since they arrived on Isle Royale in the late 1940's. The dominant pack of four wolves claimed almost the entire Island. Three other breeding pairs and four single wolves were also found, but they were regularly tracked and chased by the dominant pack. A complete turn-around in wolf food availability was seen, and all groups of wolves had ample food. Only two years ago (1980) the historic high of 50 wolves was segregated into five packs. Changes in the moose population, probably prompted by the wolf decline, were no less dramatic. Swelled by almost 200 calves, the moose population increased to over 700 in 1982. A substantial rebounding of moose is certain if subsequent cohorts of calves match that born in 1981. If wolves exhibit a moderate rebuilding of numbers within a couple years, as we expect, this predator-prey system should soon approximate that described 25 years ago. Accumulating evidence suggests that we are witnessing a predator-prey cycle with an extended period of fluctuation.			
277	Peterson, Rolf O., Page, Richard E., Vucetich, J.A.	no date	Wolf population dynamics and prey ages in Isle Royale National Park. IN: Peterson, R.O. 1994. Study of wolf decline. Chapter 8	ISRO
	At large spatial and temporal scales wolf density is broadly correlated with prey density, consistent with expectations for a top carnivore. Yet during a 2-decade period annual fluctuations of wolf numbers in ISRO were not similar to fluctuations in moose, their primary prey. Moose population level was estimated from reconstruction based on recovery of dead animals (1959-1982), on aerial surveys (1983-1993), and on simulations based on an empirical model of moose population rate of change (1994-2000). Population reconstruction was based on a field effort with an estimated recovery rate of 33%, employing corrections for seasonal bias in field effort, variable field effort, and moose yet alive. Wolf population level in 1959-1980 was best predicted by density of old moose, which provide 67% of prey biomass for ISRO wolves, including a lag of 2 years for wolf response. Wolf numbers >1980 were lower than expected based on food abundance, which reached a low point in ca. 1990 and is predicted to rise rapidly during 1990-2000.			

278	Peterson, Rolf O., Risenhoover, Kenneth L.	1984	Natural mineral licks used by Isle Royale moose	ISRO
	Refutes the conclusion of Belovsky that aquatic plants constitute the only significant source of sodium for Isle Royale moose. The objective of this paper is to provide a summary of existing knowledge of mineral licks used by Isle Royale moose together with a preliminary assessment of the ecological significance of these licks. Includes recommendations for park management to protect mineral licks from close observation by visitors.			
279	Peterson, Rolf O., Risenhoover, Kenneth L., Page, Richard E.	1984	Isle Royale wolf-moose ecology - summer report, 1984	ISRO
	During 1984 study efforts at Isle Royale concentrated on wolf-moose and moose-vegetation interactions. During the 1984 summer field season, reproduction was confirmed in two of the three existing wolf packs. Moose calf production and recruitment declined slightly from 1982 and 1983 levels, so only slight increase in moose population is possible in 1985. Fourteen moose were immobilized and outfitted with radio-transmitter collars to study moose foraging behavior which will be completed during the next two years. Recruitment of moose calves now exceeds adult mortality by about 5%; at that rate the moose population will double by the late 1990s.			
280	Peterson, Rolf O., Scheidler, Joseph M.	1977	Ecological studies of wolves on Isle Royale - annual report 1976-1977 (covering the nineteenth year in the Isle Royale studies)	ISRO
	This report summarizes the nineteenth year of field work investigating the wolf-moose relationships on Isle Royale National Park. The summer 1976 field season concentrated on examining and collecting remains of wolf-killed moose located during winter 1976 to determine age of moose taken by wolves. Moose herd composition and productivity were estimated by summer ground observations. Aerial survey conducted after October leaf-fall allowed a more accurate determination of calf production and recruitment. The 1976 calf crop was among the lowest recorded since 1970. Summer observations of wolves indicate a minimum of 8 pups alive on ISRO in late summer. Wolf observations during the 1977 winter study period indicate that this was the first year since 1969 that the wolf population did not increase and totaled 34 animals. One instance was observed of an ISRO wolf traveling to Canada across the ice this winter. Poor snow conditions precluded a reliable moose census in 1977, but the authors did note a substantial drop in the number of moose observed during routine flying.			
281	Peterson, Rolf O., Scheidler, Joseph M.	1978	Ecological studies of wolves on Isle Royale - annual report 1977-1978 (covering the twentieth year in the Isle Royale studies)	ISRO
	This report summarizes the twentieth year of field work investigating the wolf-moose relationships on Isle Royale National Park. The summer 1976 field season concentrated on locating and examining the carcasses of wolf-killed moose, determining primary wolf activity sites and the status of pups produced in the wolf population. Winter field work included a determination of the wolf population size, pack size, and social interaction of wolves. Wolf predation was observed and analyzed. The moose population was quantified.			
282	Peterson, Rolf O., Scheidler, Joseph M., Shelton, Philip C.	1979	Ecological studies of wolves on Isle Royale - annual report 1978-1979 (covering the twenty-first year of research)	ISRO
	This report summarizes the twenty-first year of field work investigating wolf and moose ecology on Isle Royale National Park. For the past five years, Isle Royale has supported the most dense wolf population known to exist; 43 wolves were present on ISRO. The summer 1978 field work concentrated on locating and examining moose carcasses, and aspects of summer wolf ecology were studied, including: food habits, location of rendezvous sites, and presence of pups. The moose population was estimated in both summer and fall, with calf abundance estimated at both times. Trends in moose mortality are discussed. Winter field work included counting the wolf population, examining territory and pack size, and observing wolf-moose interactions. The moose population was censused during this winter study period, the first time since 1974. Beaver studies involved aerial surveys, live trapping, and examinination of colonies by ground; 156 sites were observed.			
283	Peterson, Rolf O., Scheidler, Joseph M., Stephens, Philip W.	1982	Selected skeletal morphology and pathology of moose from the Kenai Peninsula, Alaska, and Isle Royale, Michigan; Canadian Journal of Zoology	ISRO
	Age-specific parameters of growth and incidence of skeletal pathology were determined for moose populations at Kenai, Alaska, and Isle Royale, Michigan, primarily from skeletal remains of wolf-killed animals. Growth patterns, determined from the metatarsus, were similar for the two populations, with cessation of growth after the third summer. Kenai moose were consistently larger than Isle Royale moose after the first summer, with an average asymptote for metatarsal growth 3% greater. Size of Isle Royale calves was inversely correlated with winter severity prior to birth. The incidence of debilitating arthritis and periodontal disease increased with age, with a similar age of onset among female moose from both populations. Coxofemoral arthritis (degenerative joint disease) occurred more often among old female moose from ISRO than from Kenai, probably contributing to a generally shorter life span. Periodontal disease occurred at a similar rate in both populations, despite a far greater rate of incisiform tooth wear in Kenai moose. The study furnished base-line data for a determination of trends in population quality and physical condition.			

284	Peterson, Rolf O., Schwartz, Charles C., Ballard, Warren B.	1983	Eruption patterns of selected teeth in three North American moose populations; Journal of Wildlife Management	ISRO
	Compares the timing of tooth eruption between moose at ISRO, Kenai Peninsula, Alaska and a captive population. The objectives of this paper is to examine timing of tooth eruption for three moose populations and assess the potential usefulness of tooth eruption as an index to moose condition.			
285	Peterson, Rolf O., Shelton, Philip C.	1983	Ecological studies of wolves on Isle Royale - annual report 1982-1983 (covering the twenty-fifth year of research)	ISRO
	On Isle Royale, the rapid decline of the wolf population in 1980-82 was reversed, and wolf numbers now approximate the average level of the 1960s. In 1982, wolf pups were born to all four breeding females present in the population. Thirteen pups survived in three packs in winter 1983, bringing wolf numbers to 23. Territorial skirmishes continued, and the West Pack II claimed 2/3 of the Island. Wolf kill rates were relatively low and carcass utilization high, reflecting low vulnerability of moose in winter. The small size of some pups this winter may reflect a low food supply in summer. The author now believes that the present food supply will not be adequate to support continued survival and expansion of all three wolf packs. The current moose population is estimated at 900, including about 400 calves and yearlings. The moose calf cohort in 1982 was large, although lower than the record cohort of 1981. Recent cohorts have not been readily killed by wolves, even as calves in winter. Wolves are now preying primarily on moose born during the late 1960's (a period of high moose density). These moose exhibit a much higher incidence of arthritis than moose born during periods of lower density.			
286	Peterson, Rolf O., Stephens, Philip W.	1980	Ecological studies of wolves on Isle Royale - annual report 1979-1980 (covering the twenty-second year of research)	ISRO
	This report summarizes the twenty-second year of wolf - moose research on Isle Royale. In 1980, the wolf population reached an all time high of 50 individuals, while the moose population was estimated at 650-700. Included is a description of the summer field work for 1979, including summer and fall moose surveys and summer wolf activity. Also included is the field work summary done during the 1980 winter study period, including analysis of the wolf population and the moose population. Other wildlife observed during this period include fox, otter, beaver, and one lynx.			
287	Peterson, Rolf O., Stephens, Philip W., Shelton, Philip C.	1981	Ecological studies of wolves on Isle Royale - annual report 1980-1981 (covering the twenty-third year of research)	ISRO
	This report summarizes the results of the 23rd year of field studies on Isle Royale including summer and winter moose studies. We primarily describe wolf movements and population status during the winter studies. The 1981 wolf population dropped from 50 to 30 individuals, the most dramatic wolf decline in the 23 year history of this research project which is attributed to a reduced food supply. Current effort in following the moose population dynamics is directed at a determination of moose density and population composition. Results of summer and fall moose population surveys are reported. The winter aerial census of moose revealed a population of 481 animals. Other species observed during the winter study period were beaver, otter, and fox. In October 1980, Shelton surveyed beaver colonies by air and ground and attempted to live-trap three colonies. The decline in numbers of colonies with food piles was essentially linear from 1974 through 1980. In 1980, there were 39 sites with fresh cutting or fresh mud on the house and 122 total sites with signs of activity.			
288	Peterson, Rolf O., Thomas, Nancy J., Thurber, Joanne M., Vucetich, John A., Waite, Thomas A.	1998	Population limitation and the wolves of Isle Royale; Journal of Mammalogy	ISRO
	The ecology and demography of wolves in Isle Royale National Park were examined. New data from 1987-95 are presented, with context provided by trends in mortality and reproduction in 1971-95 and discussion of factors limiting population growth in 1959-95. After a population crash in 1981-82 that was attributed to food shortage, wolves continued to decline till 1988. Low reproductive success prevented recovery of the wolf population after 1988. Disease screening initiated in 1988 revealed declining evidence of canine parvovirus occurrence. This disease may have played a role in the population crash of 1981-82 and may have contributed to the high mortality through 1988, but there appeared to be no disease involvement in the reproductive decline after 1988. Fewer breeding wolves, random demographic fluctuations (advanced age) may have contributed to poor reproduction. Wolf genetic characteristics support the hypothesis that reproductive success in this isolated population declined because of inbreeding depression, exacerbated by a population bottleneck in 1982, high mortality in 1981-1988, and unequal reproductive success among alpha wolves both before and after the crash.			

289	Peterson, Rolf O., Thurber, Joann M.	no date	Dynamics of Isle Royale wolves during a chronic population decline, 1987-1993. IN: Peterson, R.O. 1994. Study of wolf decline. Chapter 9	ISRO
	The ecology and demography of wolves in ISRO were examined during a sustained and unexpected population decline. After a population crash in 1981-82 that was attributed to food shortage, wolves continued to decline in 1984-88. When high mortality abruptly ceased >1988, however, poor reproductive success prevented recovery of the population. Disease screening initiated in 1988 revealed the final stages of canine parvovirus occurrence. Disease probably played an important role in the wolf population crash of 1981-82 and may have contributed to subsequent high mortality through 1987, but there was no evidence of disease involvement in reproductive failure in 1989-93. Wolf genetic characteristics support the hypothesis that reproductive success in this isolated population declined because of inbreeding depression, exacerbated by a population bottleneck in 1982, high mortality in 1981-88, and unequal reproductive success among alpha wolves both before and after the crash. By 1993 the population was at a precariously low level, with greatest extinction risks being the random elimination of one sex and a new cycle of disease.			
290	Peterson, Rolf O., Woolington, James D.	1979	Wolf-moose investigations on the Kenai Peninsula, Alaska	ISRO
	Considers causes of abnormal tooth eruption patterns in Kenai lowland calves. Mentions that delayed tooth eruption has never been observed in Isle Royale moose calves, even in cohorts born after very severe winters.			
291	Peterson, Rolf, Page, Richard E., Risenhoover, Kenneth L.	1985	National Science Foundation proposal - multi-level trophic dynamics in a large mammal system	ISRO
	According to a cover letter written by Dr. Peterson, this proposal is "the most current analysis of our ongoing studies" and the long term results portrayed in figures 4-6 are brand new and very important, since they suggest that the wolves will be food-short and may decline until the late 1980s. This study seeks an understanding of trophic dynamics exhibited by a major mammal system, the wolves and moose of Isle Royale National Park. Following completion of field studies of moose foraging behavior, wolf-moose dynamics will be integrated with moose-vegetation interaction to produce, for the first time, an integrated synthesis of the ecology of this three-level trophic system (carnivores, herbivores, and vegetation).			
292	Pictured Rocks National Lakeshore	1985	Wildlife management plan, Pictured Rocks National Lakeshore	PIRO
	The Wildlife Management Plan for Pictured Rocks National Lakeshore reviews pertinent portions of the enabling legislation, the General Management Plan, and the Memorandum of Understanding with the Michigan Department of Natural Resources for a framework to manage the wildlife of the Lakeshore. Cooperation with the Michigan DNR in planning and implementation is expected. Present habitats, disturbance history, endangered species, extirpated species, state-listed endangered species, and exotic species are discussed. Two zones of fire management are identified: one for aggressive fire suppression and one for prescribed fire. Wildlife management objectives and 3 alternatives are detailed. The primary regulation of native species is to be natural processes. Hunting and fishing are allowed when in compliance with the laws of the State of Michigan. Non-native species are not to be introduced. Re-establishing natural vegetation communities is a goal. Provision for public recreation is also recognized. Assessment and monitoring of wildlife are identified as a priority.			
294	Risenhoover, Kenneth L.	1985	Winter foraging and survival strategies of moose, Isle Royale National Park, Michigan: 3rd annual report	ISRO
	Summarizes findings for the third year of a four-year study comparing winter foraging and survival strategies of moose living in subarctic and boreal forest habitats. In the spring of 1984, sixteen moose at Isle Royale were immobilized and fitted with motion-sensing radio collars. Measured range, average distance traveled per day, active hours and foraging periods. Moose fed on 24 different browse species during the study period with balsam fir making up the bulk of winter diet and wind thrown trees were an important source of browse throughout the winter-spring period. Moose also spent a considerable amount of time ingesting arboreal lichens.			
295	Risenhoover, Kenneth L.	1987	Winter Foraging Strategies of Moose in Subarctic and Boreal Forest Habitats	ISRO
	Foraging strategies of moose (*Alces alces*) were studies in two habitats near the northern and southern limits of this species distribution in North America, including Denali National Park and Denali National Park. At both study areas, animal movements, behavior and feeding performance were largely determined by the abundance, physical characteristics and spatial arrangement of acceptable forages. Comparisons of moose resource use patterns, foraging efficiency and activity budgets strongly suggest that most habitat currently available at Denali are of higher quality, and better capable of supporting a high density moose population than are habitats at Isle Royale.			

296	Risenhoover, Kenneth L., Maass, S.A.	1987	The influence of moose on the composition and structure of Isle Royale forests; Canadian Journal of Forest Research	ISRO
	The long-term influence of moose (*Alces alces*) on the structure and species composition of three forest types in Isle Royale National Park, Michigan was evaluated using four moose-proof exclosures established in 1949-1950. Results obtained during the present study were compared with the original vegetation at each study site and with data collected by Krefting (1974) in order to discriminate between the effects of moose browsing and forest community succession. In the spruce-birch-fir climax and aspen-birch-conifer forest study sites, self-thinning and reduced light availability reduced the density of woody plant stems in exclosure areas. In the control areas, moose browsing has slowed the rate of succession. Repeated browsing on palatable species has retarded vertical growth and has prevented stems from growing beyond reach. Effects of moose browsing on succession in the aspen-birch study sites in the 1936 burn were less clear. In all three forest types, stem densities of most species and species diversity were higher in control areas than in exclosures.			
297	Risenhoover, Kenneth L., Peterson, Rolf O.	1986	Mineral licks as a sodium source for moose on Isle Royale; Oecologia (Berlin)	ISRO
	Natural mineral licks and their use by moose (*Alces alces*) on Isle Royale National Park were studied. The distribution of known licks suggested that they occurred in association with glacial debris, primarily in the western portions of the island. Moose utilized mineral springs extensively during the spring summer period and some were used year round. During summer, a pronounced diet pattern of moose visitation was apparent. Although daytime lick use declined by late June, morning and evening use continued to be relatively high throughout the study period. Peak lick use coincided with leaf-emergence in spring. moose continued to utilize mineral licks despite the availability of ponds containing aquatic plants. Sodium appeared to be the element attracting moose to licks where they ingest copious amounts of water. Observed sodium ingestion rates at licks indicate that licks provide a more concentrated source of sodium compared to aquatic plants. Based on the data presented, the authors reject the conclusions of earlier workers that aquatic plants constitute the only significant source of sodium for moose at Isle Royale.			
298	Risenhoover, Kenneth L., Peterson, Rolf O.	1987	The importance of natural mineral licks to moose on Isle Royale; Swedish Wildlife Research Supplement	ISRO
	Chemical analyses and preliminary observations of mineral lick use by moose at Isle Royale suggest that natural licks are an important source of sodium and possibly sulfur. On Isle Royale, lick use is mot limited to the summer period. Although preliminary observations suggest lick use is heaviest from late May to early June, moose continue to use licks year round including winter. In view of these observations, the authors reject the hypothesis of previous workers (see Belovsky and Jordan, 1981) that aquatic plants are the only significant source of sodium for moose, and conclude that mineral licks on Isle Royale are of considerable ecological significance.			
299	Ruhl, H. D.	1934	Isle Royale moose situation (a report to conservation commission); Michigan Dept Cons Proc	ISRO
	no abstract available			
300	Ryan, Thomas R.	1983	Managing moose in Voyageurs National Park: monthly report showing present research and an evaluation of current moose survey techniques	VOYA
	It is thought that there is a direct correlation between the proportion of adult moose (males to females) and its bearing on potential calf production (productivity). This would appear logical when mortality, home ranges, and numbers of breeding pairs are taken into account. Our present research data shows that Voyageurs National Park and surrounding areas have an uneven proportion of adult males to females and also an extremely low occurrence of yearlings and young of the year. The results of this study are based upon seven weeks of ground and aerial observations conducted in Voyageurs National Park, and present information on moose numbers, distributions, and adult-young ratios.			
301	Scheidler, Joseph Michael	1979	Population trends and mortality in Isle Royale moose	ISRO
	Population trends and mortality of Isle Royale moose were studied as part of the continuing project begun in 1958. The density of the herd has declined since 1974, based on the frequency of moose observed during field work. Explanations for the population decline are discussed, including predation by wolves, decreased productivity, and the effects of disease on moose.			
302	Scheidler, Joseph M., Peterson, Rolf O.	1977	Ecological studies of the wolf on Isle Royale - summer field work, 1977	ISRO
	The primary objective of this study was to examine the remains of wolf-killed moose spotted from aircraft during the previous winter. Moose observed during the summer were counted and productivity estimated. Efforts were also geared toward locating primary wolf activity sites and determining the presence and number of pups produced by the major packs. In October, an aerial moose composition survey was conducted.			

303	Schwartz, Charles	1992	Physiological and nutritional adaptations of moose to northern environments; Alces	ISRO
	no abstract available			
304	Seal, Ulysses S., Schmitt, S.M., Peterson, Rolf O.	1985	Carfentanil and xylazine for immobilization of moose (*Alces alces*) on Isle Royale; Journal of Wildlife Diseases	ISRO
	Moose were darted on Isle Royale National Park using the drugs carfentanil and xylazine or carfentanil alone. This article discusses immobilization time, excitement phase, reversal and recovery time.			
305	Shelton, Philip C.	1962	Ecological Studies of the Beaver, Moose, and Wolf in Isle Royale National Park, Second Annual Report, 1961-1962	ISRO
	This report summarizes the summer and fall work of 1961, which focused on beaver, and the Winter Study work of 1962, which focused on wolf and moose. Information on beaver studies included trapping and marking techniques, age and sex ratios of beaver, movements of beaver, food relationships, distances traveled for food, remaining food supplies, and the past and present status of beaver. Also presented is information on the population and sex ratio of moose, summer and winter wolf observations along with population numbers and aggregations, behavior, and age and condition of moose killed by wolves.			
306	Shelton, Philip C.	1964	Ecological studies of beavers, wolves, and moose in Isle Royale National Park Michigan - third annual report, 1962-1963	ISRO
	This report covers summer and fall work done in 1962, and winter, spring, and a limited amount of summer work done in 1963. Information presented includes beaver population studies, beaver movements, beaver distribution, beaver food relationships, beaver predation by wolves, moose census, summer wolf observations, winter wolf studies, wolf population, wolf territories, wolf hunting, and observations on red fox, snowshoe hare and otter.			
307	Shelton, Philip C.	1966	Ecological studies of beavers, wolves, and moose in Isle Royale National Park, Michigan	ISRO
	This study was part of a continuing research program begun in 1958 aimed at determining the status and relationships of the major mammals of Isle Royale. While observations of moose and wolf relationships are included in this study, the primary objective of this dissertation was to define the role of beaver in the Isle Royale ecosystem. Chapter titles are: Isle Royale as Beaver Habitat; History of Beaver Populations on Isle Royale; The Present Study; Weights, Measurements and Growth Rates; Food Relationships; Predation; and Relationships with other Wildlife. Information presented concerning the wolf-moose relationships includes: Wolf populations and aggregations; home ranges of wolf groups; territoriality; reproduction; social organization; food habits; winter studies; summer hunting activities; moose population statistics, mortality and autopsies. A chapter is "Foxes and Hares" presenting information on the red fox and snowshoe hare populations of Isle Royale.			
308	Shelton, Philip C., Peterson, Rolf O.	1983	Beaver, wolf and moose, 1971-1981	ISRO
	no abstract available			
309	Shelton, Philip C., Peterson, Rolf O.	1983	Beaver, wolf and moose interactions in Isle Royale National Park, USA; Acta Zoological Fennica	ISRO
	Population changes in Isle Royale beavers and some aspects of their relationships with predators, disease, and competitors for food are described. Abundant food resources allowed a high population to develop by 1950, after which a decline occurred, probably due to tularemia. A second increase through the 1960s was followed by a decline, caused by heavy wolf predation in the 1970s. Competition with moose for food, declining food resources, and continued wolf predation may prevent the population from again reaching high numbers.			
310	Simpson, Philip Wayne	1976	An indirect survey of nematode parasitism in Isle Royale moose	ISRO
	This study was undertaken as a result of the report of the dear meningeal worm (*Parelaphostrongylus tenuis*) found in the moose of Isle Royale. This worm is harmless in its normal host, the white-tailed deer, but may be deadly in other cervids. The objective of this study was to repeat the work of Karns and Jordan (1969) in hopes of gaining further information on the status of this nematode in the Isle Royale moose herd. Moose fecal groups were again collected and analyzed for the presence of *P. tenuis* and other nematodes.			

311	Snyder, John	1973	The study of the impact of moose browsing upon the white spruce-balsam fir-white birch forests of northeastern Isle Royale National Park, Michigan	ISRO
	The objective of this study was to determine what effects, if any, moose browsing was having on the vegetation of the park. Five study areas which had differing amounts of moose usage were selected. Overall, the browsing of moose seemed to be having a noticeable affect on the forest of the northeastern portion of Isle Royale National Park.			
312	Steinhart, Peter	1995	The company of wolves	ISRO
	Discusses what is and what is not known about wolves throughout the U.S., North America, and the World. Contains excerpts of interviews with L. David Mech and Rolf O. Peterson. Chapter 7 presents information about Rolf Peterson's early education and experiences that led to his participation in the moose-wolf project through Purdue University. This chapter goes on to discuss what has been happening with Isle Royale's wolf population since it crashed from 50 wolves in 1980 to 14 wolves in 1982. Other chapters contain information concerning Isle Royale's wolves and moose.			
313	Stenlund, Milton	1956	Moose-wolf relations on Isle Royale	ISRO
	Contains Mr. Stenlund's thoughts on the game management problems on Isle Royale in 1956. He calls for a reduction in the moose population and no trapping of wolves.			
314	Stenlund, Milton	1956	Special report on Isle Royale survey	ISRO
	A trip report on a visit to Isle Royale to survey moose exclosure study plots and control plots and to record evidence of the presence of timber wolves. Comments on presence of sharp-tailed grouse.			
315	Stephens, Philip W.	1979	Behavioral studies of Isle Royale moose: a synopsis	ISRO
	This report focuses on moose observations and includes ground observations, ratios of bulls to cows, and rutting season behavior. Tables in the report compare statistics from the past ten years.			
316	Stephens, Philip W.	1981	Population trends in Isle Royale moose: 1970-1981	ISRO
	From 1970 to 1981, the Isle Royale moose population declined almost by half. The merits of three types of population estimates are discussed as were factors which affect each of these. Additional quadrat counts were conducted and the results integrated with those of two counts of relative moose abundance. Several possible anti-predator strategies were observed.			
317	Stephens, Philip W., Peterson, Rolf O.	1984	Wolf avoidance strategies of moose; Holarctic Ecology	ISRO
	Two possible anti-predator strategies of prey were suggested by the distribution of moose at Isle Royale. Aerial surveys in winter indicated that moose density on small islets was greater than on the mainland, with about 11% of the calf population existing on the small islets which comprise less than 2% of the total land area. On small islets and shorelines, protection from wolves in the form of escape terrain is provided by nearby water in summer and coniferous cover in winter. Calves on islands appear to have a higher survival rate. In summer, cow moose with calves were seen more commonly in camps with human activity (and no wolves) than away from camps, suggesting that people provided a refuge from wolf predation for this unhunted moose population. These subtle patterns of habitat selection by moose are attributed to the intensive natural selection pressure of wolf predation.			
318	Thompson, I.D., Curran, W.J.	1993	A reexamination of moose damage to balsam fir - white birch forests in central Newfoundland: 27 years later; Canadian Journal of Forest Research	ISRO
	A 1960 study from central Newfoundland suggested that moose would: (i) reduce the commercial value of second-growth forests of central Newfoundland by excessive damage to balsam fir; (ii) eliminate white birch from the forest canopy; (iii) alter conifer species composition; and (iv) reduce the carrying capacity of the area for moose. We resurveyed the original study areas in 1987. &. Data from this study were compared with a general model of the influence of moose on balsam fir forests developed for Isle Royale, Michigan. Our data supported two predictions from Isle Royale: moose damage was highest at low balsam fir densities and at highest moose densities. Also, unlike at Isle Royale, despite heavy browsing pressure for extended periods, balsam fir will continue to dominate central Newfoundland forests.			

319	Thompson, I.D., Peterson, Rolf O.	1988	Does wolf predation alone limit the moose population in Pukaskwa Park?: A comment; Journal of Wildlife Management	ISRO
	The author’s re-evaluated information presented in Bergerud et al. (1983) and suggests that no firm conclusions can be drawn with respect to factors limiting moose populations at Pukaskwa National Park, Ontario, and that predation by wolves alone does not limit moose at Isle Royale, Michigan. They comment on 3 aspects of the 1983 paper: methods, other limiting factors, and their model. Three alternative hypotheses are presented based on the author's discussion of effects of weather, food, cohort vulnerability, and other sources of mortality.			
320	Thurber, Joann M., Peterson, Rolf O.	1993	Effects of population density and pack size on the foraging ecology of gray wolves; Journal of Mammology	ISRO
	A decline in the gray wolf population in Isle Royale National Park prompted an intensive study of radiocollared individuals in 1988-1991, complementing an ongoing study begun in 1958. During winter, 1959-1991, the proportion of lone wolves was higher when the population was at low levels, whereas average size of packs declined with density of wolves. Sizes of territories (1971-1991) were not related to size of packs. In winter, food availability (kg wolf-1 day-1) and kill interval (days/kill) varied inversely with size of packs. Social relationships of radiocollared lone wolves were flexible; they often formed temporary groups of two or three wolves. Small groups(less than four) and lone wolves roamed large areas of the island (300 km2 and 540 km2, respectively), frequently moving through territories of established packs. Solitary wolves and pairs readily killed adult moose, in contrast to a common belief that larger packs benefit from cooperative hunting.			
321	Titus, H.	1941	Progress report, Michigan experiment in transplating moose from Isle Royale; Field and Stream	ISRO
	no abstract available			
322	Tolley, I. R.	1974	The predator-prey relationship of the wolf and moose of Isle Royale	ISRO
	A pamphlet prepared for park visitors and sold at visitor centers on the island. Has a brief description of the behavior and biology of wolves and history of the wolf on Isle Royale. Contains a brief description of Isle Royale's moose.			
323	Trachtman, L. E.	1959	Wolves and moose; Purdue Research Foundation Horizon	ISRO
	Describes the early history of the wolf and moose populations on ISRO. Dr. Durward Allen of Purdue University saw Isle Royale as an experimental observatory and conceived of a broad ecological study of the Island which was begun by David Mech in 1958. Describes Mech's early observations during the first summer field season and the first winter study. This article is reprinted in Wolf's Eye 4(1), January-February 1960.			
324	U.S. Geological Survey	1979	Moose sightings: Voyageurs National Park, Minnesota	VOYA
	Map of Voyageurs National Park with locations of moose sightings in 1983, '84, '85, and '86 depicted with symbols. Sightings were made during winter aerial surveys flown by Park personnel.			
325	Van Ballenberghe, V.	1987	Effects of predation on moose numbers: a review of recent North American studies; Swedish Wildlife Research - proceedings, second international moose symposium	ISRO
	This paper first reviews recent studies of moose and predator ecology important in understanding moose/predator interactions, secondly reviews several recent moose/predator case histories, and finally reviews the literature on conceptual models of the effects of predation on moose numbers. Includes recent case history from Isle Royale.			
326	Van Ballenberghe, Victor, Peek, James M.	1971	Radiotelemetry studies of moose in northeastern Minnesota; Journal of Wildlife Management	VOYA
	Six Moose (*Alces alces*) were radio-tracked to obtain data on movements and habitat use in Northeastern Minnesota.			
327	Voyageurs National Park	1982	Voyageurs National Park: aerial moose sightings, January, 1982	VOYA
	Voyageurs Park map with hand-written locations and numbers of moose sighted during aerial surveys completed on January 10, 11, and 12, 1982.			

328	Voyageurs National Park	1985	Winter 1985 aerial moose and deer census, Voyageurs National Park	VOYA
	This in-house report from the Resource Management Specialist to the Terrestrial research Biologist and Park staff presents results of the aerial moose and deer censuses conducted January 10 to February 25, 1985 in Voyageurs National Park. Included is a photocopied map of the sighting locations.			
329	Voyageurs National Park	1986	Voyageurs National Park: 1986 aerial moose census	VOYA
	Data sheets and map (1:50,000) from aerial moose counts conducted by Voyageurs National Park staff for February 23-27, 1986.			
330	Voyageurs National Park	1986	Voyageurs National Park: moose observations, winter 1985-86	VOYA
	A single handwritten sheet describing numbers and approximate ages and sex (if known) of moose spotted by Voyageurs National Park personnel during the winter of 1985-86. Locations of moose sightings are also depicted on a 1:50,000 scale topographic map of the park.			
331	Voyageurs National Park	1986	Voyageurs National Park moose counts, 1983-1985	VOYA
	Single page that consists of a table titled: Voyageurs National Park Moose counts, 1983-85. Information for 1986 is also included. The table includes counts and totals for bulls, cows, and calves (including number/cow).			
332	Voyageurs National Park	1989	Critique on the capture and restraint of moose, winter 1989	VOYA
	In-house report which presents personal comments, critiques, and recommendations about the recent moose immobilization and collaring efforts in Voyageurs National Park.			
333	Voyageurs National Park	1992	Moose sightings, 1984-86, and 1991-92	VOYA
	List (spreadsheet) of moose sightings during aerial surveys in Voyageurs National Park for 1984, 1985, 1986, 1991, and 1992. Information on location ID's, distances to nearest neighbor, and neighbor ID is included.			
334	Voyageurs National Park	1995	Collared moose locations, Voyageurs National Park, 1994 and 1995	VOYA
	Multiple items are included in this file folder titled "Moose Census 1994, 1995": 1) Photocopies of Voyageurs National Park maps with locations of collared moose during aerial surveys at Voyageurs National Park, Minnesota, 1994-1995. 2) Photocopies of VNP maps with moose locations overlaid by transmitter information (no date). 3) Aerial Moose census form (blank sample). 4) Sampling method for counting and estimating N with low densities and clumped distributions of moose in VNP (blank form).			
335	Voyageurs National Park	1995	Moose GPS radio transmitter monitoring, Voyageurs National Park	VOYA
	Collection of data forms, hand-written notes and maps pertaining to the radio collared moose of Voyageurs National Park. Includes locations at survey times, radio collar frequency numbers, observations of calves, and general comments on animal health, movement etc.			
336	Voyageurs National Park	1997	Moose census units, 1997	VOYA
	Items in this file folder titled "Moose Census, Schaberl/VOYA, 1997" include 1) Sixteen pages of Moose Census Units Basemaps (1:24K) with notes written directly on the maps and 2) a general Moose Census Units, Voyageurs National Park map printed on 2/3/1997.			
337	Voyageurs National Park	1997	Collared moose locations at Voyageurs National Park, 1995 and 1996	VOYA
	Multiple items are included in this file folder titled "Collared Moose Locations, Voyageurs National Park, 1995 and 1996": 1) Photocopies of topographic maps with transparency overlays for collared moose locations for 1995 and 1996. 2) An introductory letter from Ron Moen (NRRI) that includes descriptive information relating to the transparency and map overlays. 3) Collared moose location maps for VNP on a 4 hour interval for 1995 and 1996 at a 1:100,000 scale.			
338	Voyageurs National Park	1998	Moose counts, Voyageurs National Park, 1998	VOYA
	Items in this file folder titled "Moose Counts (census), Schaberl/VOYA, 1998" include 1) Twenty-one pages of Moose Census Units Basemaps (7.5 min, 1:24K) of Voyageurs National Park area with notes written directly on the maps, 2) Two-three pages of handwritten notes, and 3) Two pages of main census unit maps.			
339	Voyageurs National Park, Minnesota Department Of Natural Resources	1987	Aerial moose census, Voyageurs National Park, 1987	VOYA

	Collection of aerial moose census data forms for surveys flown in 1987 in Voyageurs National Park. Data includes numbers of individuals spotted, their sex, and numbers of calves present. Also includes detailed weather conditions at time of survey.			
340	Windels, S.K., Jordan, Peter A.	1997	Why are there changing patterns of moose browsing of balsam fir at Isle Royale; Abstract published for the International Moose Symposium, Fairbanks, Alaska	ISRO
	no abstract available			
341	Wolfe, Michael L.	1969	Age determination in moose from cemental layers of molar teeth; The Journal of Wildlife Management	ISRO
	A method is described for age determination in moose (*Alces alces*) from growth layers in the cementum of molariform teeth. The technique was used to determine the ages of 140 moose over 1 year old from Isle Royale. The findings indicate that the method described provides a more reliable basis for age determination in the older age-groups than estimates of mandibular tooth wear. It also has a wide range of application because any molariform tooth may be used.			
342	Wolfe, Michael L.	1977	Mortality patterns in the Isle Royale moose population; American Midland Naturalist	ISRO
	Sex, age, and temporal distribution of 439 Isle Royale moose (*Alces alces*), dying of natural causes from approximately 1950 to 1969, are analyzed. The role of wolf predation in the regulation of this population is discussed.			
343	Wright, R. Gerald	1991	The long-term study of wolf and moose populations on Isle Royale National Park (draft manuscript)	ISRO
	This draft manuscript explores the insights that can be gained from an evaluation of the 33-year long study of the wolf and moose population dynamics on Isle Royale. The paper emphasizes how the study was organized and conducted, how the study influenced park management.			
344	Wright, R. Gerald	1992	Wildlife research and management in the National Parks	ISRO
	This book explores the role National Parks have played in the protection, study and management of animal life by tracing the history of wildlife management in the National Parks. Information concerning Isle Royale included in this book can be found in the chapters discussing "The Management of Ungulate Species" (moose) and "Wolf Reintroduction".			
345	Wright, R. Gerald	1996	Wolf and moose populations in Isle Royale National Park. IN: Havorson, W.L. and G.E.Davis (eds.). Ecosystem management in the national parks	ISRO
	Describes the history of the long-term wolf and moose research program at Isle Royale starting with the first years with Durwood Allen through Rolf Peterson. Describes the factors which brought about the start of the program and the early objectives. Describes the factors which have contributed to making this one of the longest running wildlife research programs in North America, and the contributions it has made to understanding wolf and moose ecology.			
OTTER				
1	author unknown	no date	The river otter (*Lutra canadensis*)	INDU
	The report describes the historic distribution and habitat preferences of the river otter, a species that was extirpated from northwest Indiana in 1900. Possible threats to the species are discussed, and procedures for future restoration of the river otter to Indiana Dunes National Lakeshore are included.			
2				
	Cooley, Thomas M., Schmitt, Stephen M., Friedrich, Paul D., Reis, Tim F.	2000	River otter survey, 1998-1999	PIRO
	This survey compiles information on the harvest and status of river otter (*Lutra canadensis*) in Michigan. Sex and age distribution of otters were determined from skinned carcasses voluntarily submitted by trappers. Three otters were collected from Alger county.			

3	Route, William T.	1985	Factors influencing the distribution, abundance and habits of otter in Voyageurs National Park	VOYA
	This report summarizes field work initiated in the spring of 1985 as part of the study of the distribution and abundance of the otter in Voyageurs National Park. The data presented have not been subjected to statistical analysis. Report discusses the study area, methods applied, study objectives, and progress to date on live-trapping, biotelemetry, and food habits.			
4	Route, William T.	1985	Studies on the distribution and abundance of river otter in and adjacent to Voyageurs National Park - progress report	VOYA
	This report summarizes field work initiated as part of a study on the distribution and abundance of river otter in and around Voyageurs National Park. During the summer of 1985, field work was divided among six areas of research: 1) Analyzing food habits, 2) Surveying lake and river shoreline for sign, 3) Documenting parkwide otter observations, 4) Live capturing and tagging, 5) Developing a pilot radio telemetry study, and 6) Analyzing otter carcasses.			
5	Route, William T.	1986	Data on radio-collared otters	VOYA
	Handwritten data sheets listing radio collar frequencies, name, age, sex, and weight of radioed otter, and descriptive notes for each entry. Appears to be information for the winter of 1986-1987.			
6	Route, William T., Peterson, Rolf O.	1988	Distribution and abundance of river otter in Voyageurs National Park	VOYA
	Otter distribution and abundance in relation to man-caused water fluctuations was studied from April 1985 to March 1987 in Voyageurs National Park. Baseline data were collected on the otter population and comparisons made between study areas with less-than-natural (Rainy Lake) and greater-than-natural (Namakan Reservoir) water fluctuations. Otters moved freely between large lakes and adjacent inland lakes and ponds in summer. Most otters stayed on the large lakes in winter, but 16-35% moved to inland waters. Fish and crayfish were the most important prey of otters. Use of fish remained high on Rainy Lake during both summer and winter but crayfish became more important in the summer diet of otters in Namakan Reservoir. Fresh sign and known movements of radioed otters were used to compare relative abundance. Using this method, no difference was detected in otter abundance between Rainy Lake and Namakan Reservoir. It is postulated that water fluctuations contribute to the detritus load of Namakan Reservoir Lakes, thereby causing a rapid increase in crayfish abundance and accounting for the observed differences in otter feeding habit between the two water regimes.			
RACCOON				
1	Indiana Dunes National Lakeshore	1986	Raccoons and associated health problems	INDU
	Results of raccoon sampling conducted in the summer and fall of 1986 at Indiana Dunes National Lakeshore are given. Due to the high number of sick raccoons being reported at Indiana Dunes National Lakeshore, fecal samples were tested for distemper and roundworm (*Baylisascaris procyonis*). Advisories are given for safe handling of raccoons, and there is an attached bulletin with specific information on roundworms.			
2	National Park Service	1986	Press release on raccoon roundworm problem [Draft]	INDU
	This statement provides information about the roundworm (*Baylisascaris procyonis*), which has been found in raccoons at the Indiana Dunes National Lakeshore. Advisories are given on how to avoid infection and information on the park's management of the situation are given.			
3	various compilers	no date	Raccoon data sheet	INDU
	These data sheets provide information about each raccoon (*Procyon lotor*) captured during the raccoon study period between September 1996 and June 1997. During this time, blood samples, location, number, measurements, and sex were also recorded for each animal.			
WOLF				
1	Allen, Durward L.	1957	A proposal for studies of the timber wolf and other wildlife in Isle Royale National Park	ISRO
	This is a copy of the first proposal to initiate a long-term ecological study of the mammalian species of Isle Royale, primarily the wolf, moose, beaver and snowshoe hare.			

2	Allen, Durward L.	1962	Review and prospectus of wildlife studies on Isle Royale	ISRO
	This is a brief summary of the purposes, organization, and plans for the program of graduate studies on the wolf, moose, beaver, and other major wildlife species on Isle Royale. Pages 3 and 4 present findings after the first two seasons of study. The most significant findings of this time period were concerned with the moose-wolf relationships; wolf predation appears to favor calves and moose 9 to 10 years old (half of this group shows some sort of disability or disease). The report also presents findings on moose and wolf population sizes, beaver studies, and fox and snowshoe hare.			
3	Allen, Durward L.	1964	Isle Royale: predator vs prey; Field and stream	ISRO
	The article describes research by two Purdue University graduate students at Isle Royale. From 1958 to 1961, L. David Mech concentrated on the behavior of the wolves and their effects on the moose herd. From 1960 to 1963, Philip C. Shelton studied beaver to find out how they reacted to starvation and predation.			
4	Allen, Durward L.	1967	Number, turnover, and social structure of the Isle Royale wolf	ISRO
	no abstract available			
5	Allen, Durward L.	1969	Field reports by James E Cole, covering work on wolves in Isle Royale National Park 1953-1957	ISRO
	Citation found in "Bibliogrpahy of Lake Superior National Park System Areas" by Robert Linn, 1980. A compilation of reports and memoranda concerning the wolf's arrival on Isle Royale: Cole, J. E. (1952, 1953, 1954, 1956, 1957, 1957); Hakala, R. (1953); Krefting, L. W. (1956); Linn, R. M. (1956a, 1956b). One copy only known to exist - held by Rolf O. Peterson, Department of Biological Sciences, Michigan Technological University, Houghton, MI.			
6	Allen, Durward L.	1977	Wolf research on Isle Royale. IN: Nesbitt, William H. and Jack S. Parker (eds.) North American big game, 7th Edition. Boon and Crockett Club and National Rifle Association of America	ISRO
	no abstract available			
7	Allen, Durward L.	1979	How wolves kill; Natural History	ISRO
	no abstract available			
8	Allen, Durward L.	1979	Wolves of Minong: their vital role in a wild community	ISRO
	The author summarizes wolf ecology studies at Isle Royale from 1958 through 1975, with descriptions of research party personnel and their contributions.			
9	Anderson, Clarke	1985	Can people and timber wolves co-exist?; Minnesota Volunteer	VOYA
	Article relates legal and cultural history of wolves and human relations in Minnesota. Discusses livestock predation in particular, and hunting and trapping policies.			
10	author unknown	no date	The wolf (*Canis lupis*)	INDU
	The report describes the historic distribution and habitat preferences of the gray wolf, a species that has not occurred at Indiana Dunes National Lakeshore since the early 1900s. Reasons for not restoring the wolf to its natural habitat in northwest Indiana are outlined.			
11	Bailey, Ralph E., Hickling, William C., Linn, Robert M., Mech, L. David, Nicotera, Ron, Radtke, Robert E., Rutske, Leroy, Siderits, Karl	1975	Eastern timber wolf recovery plan	ISRO
	This plan addresses factors critical to the perpetuation of the Eastern Timber wolf, through the following objectives: (1) to insure the survival of the animal in Minnesota by highly regulated management, including the establishment of a sanctuary, and by extensive improvement of the habitat of its prey, and (2) to attempt re-establishment of at least one viable population of Eastern Timber Wolves outside Minnesota and Isle Royale.			

12	Bailey, Ralph E., Hickling, William C., Linn, Robert M., Mech, L. David, Nicotera, Ron, Radtke, Robert E., Rutske, Leroy, Siderits, Karl	1978	Eastern timber wolf recovery plan	ISRO
	This plan addresses factors critical to the perpetuation of the Eastern Timber wolf, through the following objectives: (1) to insure the survival of the animal in Minnesota by highly regulated management, including the establishment of a sanctuary, and by extensive improvement of the habitat of its prey, and (2) to attempt re-establishment of at least one viable population of Eastern Timber Wolves outside Minnesota and Isle Royale. This plan delineates and schedules the actions required for securing or restoring the eastern timber wolf.			
13	Berg, William E., Fuller, Todd K., Radde, Glenn L.	1990	Minnesota wolf distribution survey, 1988-89	VOYA
	During the winter of 1988-89, the Minnesota Department of Natural Resources Forest Wildlife Populations and Research Group in Grand Rapids queried most natural resource professionals in the northern two-thirds of Minnesota in order to update knowledge of distribution and abundance of the gray wolf. During spring and summer 1989 the data were analyzed, and distribution maps were plotted. This preliminary report summarizes much of the distribution and population trend information derived from the survey. Report includes distribution maps detailing Voyageurs National Park and surrounding area.			
14	Black, Christopher Douglas	1997	Habitat characteristics of the eastern timber wolf in the north central Upper Peninsula of Michigan	PIRO
	no abstract available			
15	Brand, Christopher J., Pybus, M. J., Ballard, Warren B., Peterson, Rolf O.	no date	The role of infectious and parasitic diseases in population dynamics of the gray wolf (*Canis lupus*) in North America; submitted to Proceedings of the International Wolf Symposium, Edmonton, 1992	ISRO
	Few studies have documented the role of parasites and diseases in the population dynamics of the gray wolf. We summarize information on diseases of wolves and their known and potential influences on populations. Disease can affect wolf populations directly by causing mortality or indirectly by affecting physiological and homeostatic processes, thriftiness, reproduction, behavior, or social structure. In addition, wolves are hosts to diseases that can affect prey species, thus affecting wolf populations indirectly by reducing prey abundance or increasing vulnerability to predation. Diseases such as canine distemper are enzootic in wolf populations, whereas rabies occurs in wolves primarily as a result of transmission from other species such as arctic and red foxes occurs frequently. Dogs were suspected of introducing lice and canine parvovirus to several wolf populations. The potential for diseases and parasites to affect wolf populations and other wild and domestic animals should be considered in management plans.			
16	Brand, Christopher J., Pybus, Margo J., Ballard, Warren B.,	1995	Infectious and parasitic diseases of the gray wolf and their potential effects on wolf populations in North America	ISRO
	Numerous infectious and parasitic diseases have been reported for the gray wolf, however, few studies have documented the role of diseases in population dynamics. The potential for diseases to affect wolf populations and other wild and domestic animals should be considered in wolf management plans, particularly in plans for reintroduction of wolves to areas within their former range. This paper summarizes what is known about many infectious and parasitic diseases affecting wolves. Included are sections on canine parvovirus and its affects on Isle Royale's wolf population; and the hydatid tapeworm. Other diseases discussed are: rabies, canine distemper, brucellosis, leptospirosis, lyme disease, tularemia, bovine tuberculosis, blastomycosis, dog heartworm, dog hookworm, liver fluke, lice, and mites.			
17	Buller, Sheri A.	1994	Summer movements and home range size of a female eastern timber wolf	PIRO
	Home range size and summer daily movements (km/hr) of eastern timber wolf (*Canis lupus lycaon*) in northeastern MN were calculated by monitoring a mature, subordinate, female wolf outfitted with a radio tracking collar. Data were collected in thirty-one 24 hr tracking sessions between late June 1989 and mid August 1991. Mean daily distance covered was calculated. Rest periods were noted. Management recommendations to ensure survival of timber wolf are provided.			

18	Clary, Benton J.	1990	Justification for temporary closure of the Locator lake and Cruiser lake trails In Voyageurs National Park, May 7 to May 25, 1990	VOYA
	Document discussing the reasons and enabling legislation behind the decision to temporarily close the Locator Lake and Cruiser Lake trails in Voyageurs National Park during live-trapping operations for wolf research.			
19	Cochrane, Jean Fitts, Haight, Robert G., Starfield, Tony	1996	Gray wolf population model for Voyageurs National Park, Minnesota - a project proposal	VOYA
	"This is a proposal to develop a "dynamic, territorial model of the wolf population in the Voyageurs National Park. The model would 1) coalesce and interpret data on wolves in the Voyageurs NP region, 2) clarify options and support decisions about wolf management, and 3) identify research needs. The model would be an individual-based, demographic model with social and spatial elements simulating pack behavior and habitat patches used by park wolves, and it would be able to interface with the VNP geographic information system (GIS). " (Excerpt from author's abstract)			
20	Cole, Glen F.	1986	Measuring the effects of winter trails on wolves and other park wildlife	VOYA
	Document proposing various study alternatives for determining whether or not snowmobile usage is having adverse effects on wolves or			
21	Cole, James E.	1952	Presence of timber wolves in Isle Royale National Park	ISRO
	Summarizes wildlife investigations from 4-29-52 through 5-22-52 concerning the presence of wolves on Isle Royale. No wolves were seen though numerous tracks and scats were observed. Author relates comments made by Isle Royale workers and fishermen who place wolves on Isle Royale as early as 1949, based on their observations of scat and tracks. This report was written in response to a planned wolf restocking program for Isle Royale.			
22	Cole, James E.	1952	Report on field trip to Isle Royale, spring 1952 memorandum report to regional naturalist, region two, from biologist	ISRO
	no abstract available			
23	Cole, James E.	1953	Special report - winter study, 1953 - Isle Royale National Park memorandum report to regional naturalist, region two, National Park Service, from biologist file coded N1459 ISRO	ISRO
	no abstract available			
24	Drummer, Thomas D., Huntzinger, Brett, Johnson, Jamie S., Peterson, Rolf O., Potvin, Marcel J., Vucetich, Leah M., Vucetich, John A.	2002	Recovery of the gray wolf (*Canis lupus*) in Upper Michigan	PIRO
	Characteristics of gray wolf (*Canis lupus*) populations monitored in the Upper Peninsula of Michigan are reported. These include an analysis of wolf use of habitat in relation to roads, wolf demographics, deer kill rate of wolves in winter, and biological carrying capacity. Figures include timelines for wolves captured and monitored by aerial telemetry, maps of wolf pack territories and long distance dispersals, annual survival rates by sex and season, and locations of wolf-killed deer. Multiple projections for wolf carrying capacity were generated and discussed.			
25	Drummer, Thomas D., Peterson, Rolf O.	no date	The wolves of Isle Royale: demography and extinction; submitted to Ecological Applications, 2/90	ISRO
	no abstract available			
26	Evans, Scott	no date	animal survey - wolves in VNP, 1992	VOYA
	Data forms and maps pertaining to locations of radio-collared wolves on October 15, 1992 during aerial surveys.			
27	Fisher, John S.	1975	Behavior and food habits of timber wolves (*Canis lupus*) in St Louis County, Minnesota	VOYA
	"Wolves (*Canis lupus*) were studied in northern St. Louis county, Minnesota, to determine their populations, foods, and travel habits. Findings were based primarily on track observations and scat analyses. Two wolf packs inhabited the study area, occupying specific and largely separate home ranges." (excerpt from authors abstract). Study area is now within Voyageurs National Park.			

28	Fritts, Steven H., Paul, William J., Mech, L. David	1984	Movements of translocated wolves in Minnesota; J Wildl Manage	VOYA
	107 wolves were captured at or near farms in Minnesota where depredations on livestock had occurred, and were translocated into extensive forests 50 - 317 km away. 17 wolves were radiotracked and 16 others were recovered. Tracking results showed that adults left release areas quickly, but pups tended to linger or settle nearby. Wolves released together did not remain together. Eight of the adults homed to capture areas that were les than 64 km from the release sites, while some non-homing wolves were tracked or recovered 32 - 351 km from their capture sites and 23-302 km from their release sites. In general, tranlocation did not keep problem wolves out of livestock areas. Data includes wolves captured in International Falls and surrounding areas.			
29	Fuller, Todd K.	1989	Population dynamics of wolves in north-central Minnesota; Wildlife Monographs	VOYA
	During September 1980 - December 1986, 81 radio-collared wolves (*Canis lupus*) were monitored in and near the 839 km 2 Bearville Study Area (BSA) in north-central Minnesota. Winter territory sizes, territory road densities, movement patterns, dispersal rates, pack size, annual wolf density, predation trends, and mortality rates and causes were studied and reported on.			
30	Fuller, Todd K.	1994	Guidelines for gray wolf management in the Northern Great Lakes Region	VOYA
	"Three important factors affecting gray wolf (*Canis lupus*) distribution and density, and thus the keys to understanding their ecology and management, are food, human-caused deaths, and adequate source populations. In other management guidelines, I summarize current knowledge of wolf population biology and emphasize the ways wolf numbers change. Specific actions required to manage wolves in the northern Great Lakes region, whether recovering or overpopulating, are identified. The ways to evaluate the results of management actions and to identify additional areas of research needed to improve management efficiency are outlined. Clearer understanding of wolf biology allows more judicious consideration of the important political ramifications and human dimensions of wolf management." (abstract by author)			
31	Fuller, Todd K., Berg, William E(Bill)., Radde, Glenn L., Lenarz, Mark S., Joselyn,	1992	A history and current estimate of wolf distribution and numbers in Minnesota; Wildlife Society Bulletin	VOYA
	"During winter 1988-89, 362 state, county, federal, and private natural resource personnel provided 1,244 records of wolf observations and sign throughout northern Minnesota. Survey results, combined with GIS data on road and human population density, indicated wolf packs occupied a minimum of 53,100 km2." This report summarizes the data collected and presents a history of the known wolf distributions. (Quotes taken from author's summary)			
32	Fuller, Todd K., Sampson, Barry A.	1988	Evaluation of a Simulated Howling Survey for Wolves; J Wildl Mange,	VOYA
	"Wolf (*Canis lupus*) packs were surveyed using simulated howling survey (Harrington and Mech 1992) in a 1,400-km2 area of northcentral Minnesota with a known density of radio-marked packs. Mean distance that wolf howls could be heard was 2 km (n = 74 trials). Howling at 55 sites indicated the presence of 5 packs and resulted in a density estimate (7.5 packs /1,000 km2) that was imprecise (95% CI = 2.5 - 16.4/1,000 km2) and 1.7 X greater than the actual density (4.3 /1,000 km2). Because of logistical and statistical constraints, the technique is not practical for surveying large area, but simulated howling is useful for locating packs in smaller areas." (excerpt from authors abstract)			
33	Gazis, D.C., Montroll, E. W., Ryniker, J.E.	1973	Age-specific, deterministic model of predator-prey populations: application to Isle Royale; IBM Journal of Research Development	ISRO
	A deterministic model is proposed for the description of predator-prey systems in which the prey has an age-specific vulnerability to predation. The model is developed on the basis of observations of the moose and wolf populations of Isle Royale, Michigan. The moose are divided into three groups, the very young, the adults, and the very old or sick. The three groups have different vulnerability to wolf predation by a single population of wolves. The model incorporates a saturation effect for the moose population and a satiation effect for the wolf population. It appears to reproduce quite well the almost monotonic trend toward equilibrium observed since the arrival of the wolves on the island.			
34	Gogan, Peter J.P.	1987	Project proposal, study of wolf population at Voyageurs National Park	VOYA
	A study of the ecological status of wolves at Voyageurs National Park was begun in October of 1988. The study is broken down into a number of specific research tasks. This proposal details the schedule of completion of those tasks in FY 90 through FY 92. The associated costs are detailed in the attached budget. Monies to cover these costs are requested from NRPP funds. (abstract by author).			

35	Gogan, Peter J.P.	1989	Conversation with park neighbor on wolves	VOYA
	Hand written account of a phone conversation between park researcher, Pete Gogan, and a park neighbor. Relays important information on wolf pack rendezvous areas and possible illegal hunting activities.			
36	Gogan, Peter J.P.	1990	The role of disease in the ecology of the eastern timber wolf	VOYA
	Disease has recently emerged as a potential limiting factor in wolf population ecology in Voyageurs and Isle Royale National Parks, the only NPS units outside Alaska with well-established populations of this top carnivore. To further a comprehensive understanding of the role of disease in wolf dynamics and provide an understanding of the ecology of transmission for a specific disease of importance to both wildlife and humans, we propose intensive studies of Lyme disease and wolves. We propose a 2-part study: One part focusing on vectors which ultimately lead to exposure of wolves to Lyme disease, and the second part an experimental study to determine the influence of Lyme disease on wolf reproductive success. (Abstract by author)			
37	Gogan, Peter J.P.	no date	Status report - study of the wolf population in Voyageurs National Park - Fy 89	VOYA
	Research in the winter 1987-88 focused on identifying wolf packs and determining pack size by following tracks in the snow. Tracking was repeated during winter 1988-89 and related to known movements of radio-collared animals to refine estimates.			
38	Gogan, Peter J.P.	no date	Radio-collared wolf record	VOYA
	Copy of the records for a specific wolf radio-collared as part of the study in Voyageurs National Park. Note attached indicates the records were sent by Peter Gogan from Yellowstone NP per request from Scott Evans and Mac Brock at VNP.			
39	Gogan, Peter J.P.	no date	The effects of road density on wolves - DRAFT	VOYA
	This research proposal solicits partial support from the Superior National Forest to investigate the effects of road density on the eastern timber wolf (*Canis lupus*). Requested funding would enable VNP to expand ongoing research to include the LaCroix District for the purpose of comparing areas with varying road density, namely, VNP with low, SNF with moderate, and adjacent state and private lands with high, road densities.			
40	Gogan, Peter J.P., Cochrane, Jean Fitts	1997	Home range and survival of wolves in and adjacent to Voyageurs National Park; making protection work, parks and reserves in a crowded, changing world : Abstracts from the 9th Conference on Research and Resource Management in Parks and on Public Lands	VOYA
	Concern over the potential impact of human activities on gray wolves within and adjacent to Voyageurs National Park prompted an in-depth field study of the species between 1987-91. Thirty-one wolves were live- trapped, fitted with radio collars with mortality sensors, and released at the capture site. These animals were relocated from the air to determine home ranges, survival and mortality. Home ranges were initially classified as within, border or outside the park. Subsequently, animals with >=70% of the relocations inside or outside the park were reclassified as inside and outside, respectively. Mean annual survival for wolves >=6 months was 0.66. Survival was significantly lower in 1988-89 than in 1989-90 or 1990-91. Mean annual survival was higher for park wolves than for outside wolves. However, this difference can be attributed solely to a greater number of outside than park wolves sampled in 1988-89, a year of particularly poor survival. Humans accounted for about 59% of the mortality. All human-induced mortality occurred outside the park boundaries. Natural mortality was higher among wolves with home ranges within the park than wolves outside the park.			
41	Gogan, Peter J.P., Fitts Cochrane, Jean, Olexa, Edward M.	1997	Home ranges and survival of gray wolves in and adjacent to Voyageurs National Park, Minnesota	VOYA
	"We examined survivorship and mortality causes among radio-collared gray wolves (*Canis lupus lyacon*) in and immediately south of Voyageurs National Park, Minnesota, between 1987 and 1991. Average annual adult survival (66%) was not significantly different between years. Survival from September to April was significantly greater for adults (66%) than for pups (25%). Annual survival inside and outside the park was similar. However, all mortality within the park was attributable to natural causes while all mortality outside the park was human induced." (Abstract by author).			
42	Gogan, Peter J.P., Route, William T.	1990	Present status of gray wolves handled during ecological studies at Voyageurs National Park	VOYA
	List of all wolves handled, both dead and alive, during the ecological study conducted in Voyageurs National Park. Includes both dead and live specimens and those located in Ontario as well as the US Data lists radio frequencies, dates handled, and diagnosis of the cause of death where applicable.			

43	Grim, Leland H.	1992	Voyageurs National Park annual wolf howling survey results, 1992	VOYA
	Annual wolf howling surveys were initiated in Voyageurs National Park in 1988 in order to identify wolf rendezvous sites (so they can be protected) and to detect trends in wolf populations and pup survival. UTM coordinates of the 24 survey plots are listed. Results of the 1992 survey are presented along with a summary of wolf responses at each of the sites since 1988.			
44	Groebner, Daniel J.	1991	Summer movement rates of a pair of northeastern Minnesota timber wolves	PIRO
	no abstract available			
45	Gurtin, Scott D.	1996	Wolf howling survey results 1988 to 1996, Voyageurs National Park, International Falls, MN	VOYA
	"Annual wolf (*Canis lupus*) howling surveys were initiated in Voyageurs National Park (VOYA) in 1988. The surveys were initiated as a less expensive means of estimating wolf pack locations and/or rendezvous sites than aerial methods." Complete howling surveys were conducted from 1988 to 1992. No howling surveys were conducted in 1993 or 1994, and partial surveys were conducted in 1995 and 1996." (Excerpts from author's introduction.) This report provides the data obtained from these surveys, maps and UTM coordinates of sample site locations, a discussion of the results, and recommendations for future surveyors.			
46	Haber, Gordon	1965	Observations of and pertaining to the Timber Wolf (*Canis lupus*), in Isle Royale National Park, During the summer of 1964	ISRO
	Written by the Fire Control Aid stationed at Feldtmann Lookout on Isle Royale in 1964, this report describes his observations of wolves from that summer season. Summer wolf behavior is described, especially pertaining to summer travel routes, aggregations, and howling. Locations of moose kills were recorded.			
47	Haight, Robert G., Mladenoff, David L., Wydeven, Adrian P.	1995	How viable are small isolated wolf populations?	VOYA
	Protecting local populations of gray wolves is an important element of wolf recovery and management. We developed a spatially-explicit model to estimate the joint effects of mortality, immigration, and habitat carrying capacity on the persistence of small wolf populations. The model predicts population change as a function of age and social structure of wolves within packs. Results from validation experiments showed that short-term predictions of population growth and structure matched observations of population in north-central MN and elsewhere in N. America. Only populations with 6 or more packs subject to low annual mortality rates (< 15%) had > 90% survival probability. The causes of extinction were mortality and failure of surviving wolves to find mates and recolonize vacant territories in the local area. An immigration rate of only one wolf per year greatly improved population persistence. Increasing population productivity by reducing pup mortality also increased the likelihood of population survival. Dispersing wolves need access to neighboring populations and favorable habitat.			
48	Hakala, D. Robert	1954	Wolf on Isle Royale!; Nature Magazine	ISRO
	Describes the first sighting of four wolves during the February 1952 winter study; one male, one female, and two pups. The adults probably crossed the ice from Canada during the winter of 1950-51, when ice is known to have extended across the fifteen-mile channel that winter. Also describes the finding of wolf tracks on Isle Royale in the fall of 1950 and sightings of two wolves in October, 1952.			
49	Hammill, James	1995	Wolf monitoring project 1995	PIRO
	The report discusses the history of gray wolf (*Canis lupus*) distribution in Michigan. In 1980, it became apparent that wolves were immigrating to the Upper Peninsula. Monitoring efforts have since gradually intensified and become more formalized. The wolf program consists of population monitoring, education and outreach, and radiotracking. Public relations with the Timber Wolf Alliance and other wolf support groups have been emphasized. A map indicates the spring 1995 population of wolves in Michigan.			
50	Hammill, James H., Kenner, Brian C.	1994	Current status of the wolf in Michigan. Lake Superior National Parks research conference (Abstract)	PIRO
	Population of native gray wolves (*Canis lupus*), recently near zero in Michigan, is increasing. Michigan Department of Natural Resources monitoring has confirmed breeding and pup production in the Upper Peninsula and estimated the population in the spring of 1994 to be 57 wolves (excluding Isle Royale National Park). Radio tracking of collared wolves has provided data on home range, reproduction, and survival of 3 packs. Three wolves have died since 1992 of the symptoms of sarcoptic mange (caused by parasite). Habitat availability, likelihood of recovery, and the state's initiatives to restore the wolf are addressed.			

51	Hardwig, J.T.	1978	Timber wolf (*Canis lupus*) food habits, Voyageurs National Park, 1977-1978	VOYA
	"The food habits of the eastern timber wolves (*Canis lupus*) in Voyageurs National Park were studied during 1977 and 1978. The results presented in this report are based on the analysis of 175 wolf scats collected by VNP officials and are intended to show the dependence of the wolf on the various food sources in the park. Analysis revealed 187 prey type occurrences."			
52	Harmon, David	1990	Last call for Isle Royale's wolves?; Lake Superior Magazine	ISRO
	no abstract available			
53	Harrington, Fred H.	1987	Aggressive howling in wolves; Animal Behavior	VOYA
	"During two studies that investigated the responses of wolf packs to either human stimulations or pre-recorded playback of wolf, *Canis lupus* , howling, single adult wolves from five different packs approached my location and howled a total of six occasions. The howls uttered by these close-approaching wolves were significantly deeper in pitch than comparable samples of howls recorded from animals that did not approach. In addition, howls of two of the five animals differed in structure from most of the other howls recorded during both studies. These close-approach howls were characterized by the presence of a harmonically unrelated frequency sidebands near the end of the howl. " (Excerpt from author's abstract)			
54	Harrington, Fred H., Mech, L. David	1982	An analysis of howling response parameters useful for wolf pack censusing; J Wildl Manage	VOYA
	Gray wolves were studied for two years in the Superior National Forest by radio-tracking and simulated howling. Two censuses, a saturation census and a sampling census are described and recommendations on techniques for using simulated howling censuses are presented.			
55	Harrington, Fred H., Mech, L. David	1982	Fall and winter homesite use by wolves in northeastern Minnesota; The Canadian Field-Naturalist	VOYA
	"Post abandonment homesite use by wolves (*Canis lupus*) was studied by radio-tracking and simulated howling in two packs in the Superior National Forest, Minnesota. Pups, yearlings, and adults returned intermittently to former homesites up to four months after abandonment, usually after prolonged separation from the pack in early fall. Returns sometimes exceeded one week. Preferred summer homesites were revisited most frequently. Visits declined as the season progressed either because attempts to relocate the pack were not facilitated, or simply because separations became rare. While temporarily at homesites, single wolves replied significantly more to simulated howling than when anywhere else, suggesting that homesites may provide reassurance for separated wolves." (Abstract by author)			
56	Harrington, Fred. H., Mech, L.David	1983	Wolf pack spacing: howling as a territory-independent spacing mechanism in a territorial population; Behav Ecol Sociobiol	VOYA
	Howling is a principal means of spacing in wolf populations. The relationship between a pack's response to howling (replies, movements) and its location within its home range, was studied using human-simulated howling in a territorial population in northeastern Minnesota. The results indicated the responses were independent of the pack's location, or the locations of the pack and playback relation to the territory center. These results indicate that howling serves as a territory-independent spacing mechanism that will result in the use of exclusive territories when coupled with strong, year-round site attachment, but with floating, exclusive, buffer-areas about migratory packs. (Abstract by author).			
57	Harrington, Fred H., Mech, L.David, Fritts, Steven H.	1983	Pack size and wolf pup survival: their relationship under varying ecological conditions; Behav Ecol Sociobiol	VOYA
	In the Superior National Forest and the Beltrami Island State Forest in northern Minnesota, the relationship between pack size and two parameters of reproductive success (litter size and pup weights) were determined for two wolf populations. Suggestions of the influence of ecological factors in relation to willingness of auxiliary pack members to provide food to the pups are discussed.			
58	Henderson, Floyd A.	1952	Memorandum from chief ranger, Isle Royale National Park to superintendent, Isle Royale National Park concerning the wolf planting project	ISRO
	This memorandum from the Chief Ranger at Isle Royale National Park gives details on the planting of four zoo raised wolves at Isle Royale in 1952.			

59	Hendrickson, John, Robinson, William L., Mech, L. David	1975	Status of the wolf in Michigan; American Midland Naturalist	ISRO, PIRO
	Wolf (*Canis lupus*) numbers in Michigan's Upper Peninsula declined from an estimated 45-50 animals in the mid-1950s to near extinction in 1973, probably because of overharvesting through the bounty system. Sporadic breeding and occasional immigration of wolves from Ontario and Minnesota are postulated to be the factors tending to maintain the present population at the level of perhaps six individuals, with illegal shooting and incidental capture by coyote bounty trappers apparently suppressing it.			
60	Jordan, Peter A.	1969	Leadership and group response in timber wolves: a socio-ecological analysis; Paper presented at 1969 annual meeting of Rural Soc Soc, San Francisco, August 31	ISRO
	no abstract available			
61	Jordan, Peter A., Shelton, Philip C., Allen, Durward L.	1967	Numbers, turnover, and social structure of the Isle Royale wolf population; American Zoologist	ISRO
	Observations of wolves on Isle Royale are reported for 1961-66, with interpretations including the earlier 3-year period described by Mech (1966). The wolf population varied from approximately 22 to 28 in midwinter. The population remained relatively stable; mating occurred every winter; and adult mortality appeared to be low. High mortality among pups seemed to be the point of population control. Numbers in the large pack probably were curtailed through the progressive exclusion of aged and socially subordinate individuals. Under harassment these animals separated and became pack-following scavengers, then probably true loners ranging outside the area used by the pack. Smaller aggregations of two or three non-breeders were seen each winter, as were the loners, some of which appeared thin and week. The only known breeding outside the big pack was in a group of five present in the winter of 1965. This group was probably a family unit which separated from the main pack. In the winter of 1966 the alpha male of the large pack became lame and was killed. This background appears favorable for further changes in social organization.			
62	Kellert, Stephen R.	1990	Public attitudes and beliefs about the wolf and its restoration in Michigan	ISRO
	A study of public attitudes, knowledge and behavioral relations to the wolf was conducted in Michigan during the of summer 1990. A survey was mailed to random samples of the general public in the upper and lower peninsulas. Relatively strong support for wolf restoration occurred among the different sample groups, with the exception of farmers. Various results are included in the report regarding elements of wolf restoration and recovery, as well as conflicts between humans and wolves. Basic attitudes toward the wolf are explored among various constituencies and demographic groups. Finally, direct and indirect experience with the wolf is assessed, as well as preference for varying sources of information about wolves and wildlife in Michigan. A section of this survey and report deals specifically with the presence of wolves at Isle Royale National Park.			
63	Krumenaker, Robert J.	1988	Wolf decline fact summary	ISRO
	Lists population numbers for wolf and moose for each year from 1980 through 1988. Describes hypotheses for wolf population decline including food availability, disease (parvovirus), and lack of genetic diversity. States possible change in current "hands-off" policy regarding the wolves in order to get blood samples to test for parvo or genetic problems.			
64	Lajeunesse, T. A., Peterson, Rolf O.	1993	Marrow and kidney fat as condition indices in gray wolves; Wildlife Society Bulletin	ISRO
	A study to determine if fat mobilization trends in wolves were similar to ungulate fat mobilization as individuals become increasingly undernourished and if body fat indices in wolves can be interpreted similarly.			
65	Landon, David, Waite, Carol A., Peterson, Rolf O., Mech, L. David	1998	Evaluation of age determination techniques for gray wolves; Journal of Wildlife Management	ISRO
	This study evolved from a need to estimate the age structure for the unexploited wolf population of Isle Royale National Park. Evaluated tooth wear, cranial suture fusion, closure of the canine pulp cavity, and cementum annuli as methods of age detrmination for known- and unknown-age gray wolves (*Canis lupus*) from Alaska, Minnesota, Ontario, and Isle Royale, Michigan. Cranial suture fusion is of limited utility in age determination, while tooth wear can be used to estimate age of adult wolves within four years. Wolves less than seven years old could be aged to within one to three years with a regression equation for closure of the canine pulp cavity. Although inaccuracy remains a problem, cementum-annulus counts were the most promising means of estimating age for gray wolves.			

66	Lehman, Niles, Clarkson, Peter, Mech, L. David, Meier, Thomas J., Wayne, Robert K.	1992	A study of the genetic relationships within and among wolf packs using DNA fingerprinting and mitochondrial DNA; Behavioral Ecology and Sociobiology	VOYA
	DNA fingerprinting and mitochondrial DNA analysis were used in combination to study relatedness in natural populations of wolves in Minnesota (Superior National Forest), Alaska, and the Northwest Territories. Results show that the packs consist primarily of closely related (genetically) individuals, but with some packs also having unrelated, non-reproducing individuals as well. Dispersal among packs within the same area was common, particularly with females.			
67	Linn, Robert M.	1956	Wildlife observations on Isle Royale, February and March, 1956	ISRO
	Reports on wildlife observations and wildlife behavior observations in five areas of the island accessible from Camp Siskiwit. The areas visited are mature black spruce-cedar swamps, mature white birch forest, 20-year successional change forest (1936 burn), and sugar maple-yellow birch climax forest. Primarily reports on observations of moose and wolves and the condition of the vegetation in each area. Moose and wolf populations are estimated. Sharp-tailed grouse were seed in the 20-year successional forest. Wolves were observed stalking the sharptails near Feldtmann Ridge.			
68	Mcnamee, Thomas	1982	Trouble in wolf heaven; Audubon	ISRO
	Brief history of the caribou population, the early moose population and the arrival of wolves on Isle Royale. Describes the author's visit to ISRO during the winter study in 1981. Describes reasons for closing the park to visitors during the winter months for the protection of the wolves. Several nice color photos.			
69	Michigan Gray Wolf Recovery Team	1996	Draft Michigan gray wolf recovery and management plan [DRAFT]	PIRO
	A cooperative arrangement between several state, federal, and tribal agencies, and private support groups is aimed at assuring gray wolf (*Canis lupus*) recovery in the Upper Peninsula of Michigan. Three levels of population attainment are defined, none of which involve introductions of the gray wolf. Recovery strategy is outlined. Reviewed are wolf biology (social structure, reproduction, and mortality), ecology, history of the wolf in Michigan, current distribution, public attitudes, monitoring plans, budget and funding, and several aspects of wolf management. Details about wolf management are presented under the following categories: public education, habitat management, prey management, legalities of wolf protection, predation, diseases and parasites, wolf-dog hybidization, research, and wolves in confinement. The Plan will be reviewed in 5 years. Maps illustrate wolf distribution in Michigan in 1994-95 and the potential for wolf occupancy across the Upper Peninsula. Summary of concerns expressed in public forum meetings is included.			
70	Michigan Gray Wolf Recovery Team	1997	Michigan gray wolf recovery and management plan	PIRO
	A cooperative arrangement between several state, federal, and tribal agencies and private support groups is aimed at assuring gray wolf (*Canis lupus*) recovery in the Upper Peninsula of Michigan. The plan summarizes wolf biology, history, status, and distribution. Three levels of wolf restoration are defined, none of which involve introductions of gray wolf. Wolf management is addressed in the following categories: education and information, wolf population research and monitoring, wolf habitat management, prey species and prey management, wolf protection, depredation, diseases and parasites, wolf introductions, and captive wolves and wolf-dog hybrids. The recovery and management plan will be updated in no more than 5 years. Maps illustrate wolf distribution in Michigan in 1994-95 and the potential for wolf occupancy across the Upper Peninsula. Appendices include a summary of public forum meetings, delisting procedures, and recommended home site management.			
71	Nash, Stephen	1989	Wolves of Isle Royale: scientists test a dying population; National Parks magazine	ISRO
	The article discusses the possible reasons for the wolf population crash in the winter of 1988 including lack of food, disease, and inbreeding.			
72	National Biological Survey, National Wildlife Health Research Center	1994	Wolf necropsy reports	ISRO
	Contains two necropsy reports, one for a male from the Middle Pack that died in January 1994 and the other for a female from the Middle Pack that died in February 1994. The male died of emaciation secondary to severe tooth wear and breakage. The female died of emaciation secondary to severe tooth wear and breakage and cardiomegaly.			

73	Natural Hertitage Program (Michigan)	1995	Upper Peninsula wolves on the way to recovery; The spotting scope	PIRO
	Brief, popular report summarizes the status of the gray wolf (*Canis lupus*) population in the Upper Peninsula, MI. Recent increases in the animals' numbers are the result of immigration from Wisconsin and Ontario and breeding success. The latest winter census of 1995 documented 80 wolves in 12 packs throughout the Upper Peninsula, in addition to the 16 wolves in 3 packs on Isle Royale National Park in Lake Superior.			
74	National Park Service	1951	Correspondence on Isle Royale as sanctuary for wolves and correspondence and reports on planting of four wolves (zoo raised) in Isle Royale National Park	ISRO
	At a time when Isle Royale's moose population was burgeoning and citizens on the mainland were concerned about the decline of the wolf population in Michigan, an appeal began to designate Isle Royale as a sanctuary for the wolf. This culminated in the planting of four zoo raised wolves on the Island. This volume contains correspondence from the public, newspapers, and national park service officials concerning this project.			
75	Neff, Edwin D.	1952	? related to the idea of Isle Royale as sanctuary for wolves; Natural History	ISRO
	no abstract available			
76	Nelson, Michael E., Mech, L. David	1992	Winter wolf density in the east-central Boundary Waters Canoe Area in Northeastern Minnesota, 1989-90 and 1990-91	VOYA
	Winter wolf (*Canis lupus*) density in the east-central Boundary Waters Canoe Area Wilderness (BWCAW) was estimated from tracks and direct observations of wolf packs during winters 1989-90 and 1990-91. The wolf density of packs in a 900 mi2 (2304 km^2) area was 52 wolves/1000 mi2 (20 wolves/1000 km^2) in 1990 and 42 wolves/1000 mi2 (16 wolves/1000 km^2) in 1991. These are minimum estimates for resident packs and are lower but similar to wolf densities from nearby radio-marked packs.			
77	Peterson, Rolf O.	1973	Ecological studies of the wolf on Isle Royale - summer field work, 1973	ISRO
	Discusses findings of 1973 summer field season regarding specimens collected from wolf-killed moose located during winter study 1973. A significant number of young adults were killed by wolves in the winter of 1973, supporting the hypothesis that severe winters may have an adverse effect on life expectancy of calves born before or after such a winter. All moose remains encountered during summer field work were also examined. Moose observations showed that calf production was higher in 1973 than in the previous three years, probably due to the unusually mild winter of 1973. One wolf pack was monitored using howling responses and by direct observation at one of four rendezvous areas. Seven healthy pups were observed with this pack. Wolf scat was collected and analyzed. The increase in beaver density in recent years appears to have been accompanied by an increase in wolf utilization of beaver.			
78	Peterson, Rolf O.	1974	Wolf research proposal - radio telemetry of wolves	ISRO
	This is a proposal to live trap, handle and radio collar wolves on Isle Royale. The objectives for collaring wolves are to provide the National Park Service an assessment of the impact of human visitation on wolf movements and behavior, to systematically study wolves during the spring through fall, to increase tracking efficiency and data collection during winter study, and to provide data on population turnover and mortality. This file includes letters written by the Isle Royale Superintendent and the Acting Regional Director as to why this proposal was turned down.			
79	Peterson, Rolf O.	1974	Wolf ecology and prey relationships of Isle Royale	ISRO
	This is the unpublished version of the National Park Service Monograph published in 1977 (Number 11). Describes predator-prey relationships between wolves and moose at Isle Royale National Park between 1970 and 1974. During the winter study period the author was able to track two wolf packs, obtaining data on food availability, kill rates, social contact between the two packs, and the social hierarchy in the packs. Moose population dynamics are described. Wolf predation accounted for most winter mortality of moose in winter and moose appeared to be under increasing nutritional stress throughout the study, and moose productivity had declined.			
80	Peterson, Rolf O.	1976	Wolf survey in Voyageurs National Park	VOYA
	During the period from December 29, 1975 to January 4, 1976, aerial surveys for eastern timber wolves in Voyageurs National Park were conducted. No wolves were sighted and track counts were difficult due to the large number of deer/moose tracks. A rough estimate of 25-30 wolves was arrived at through track counts and sightings provided by private citizens. The bulk of this report appears to be data on white-tailed deer and moose surveys.			

81	Peterson, Rolf O.	1977	Wolf ecology and prey relationships on Isle Royale; National Park Service Monograph Series No 11	ISRO
	Describes predator-prey relationships between wolves and moose at Isle Royale National Park between 1970 and 1974. Study during winter tracked two wolf packs, obtaining data on food availability, kill rates, social contacts between the packs, and social hierarchy in the packs. Wolf predation accounted for most winter mortality of moose in winter and moose appeared to be under increasing nutritional stress throughout study.			
82	Peterson, Rolf O.	1979	Social rejection following mating of a subordinate wolf; Journal of Mammalogy	ISRO
	Studies of captive wolves have indicated that social rank within a wolf pack has a tremendous influence on courtship and mating. Through aggressive behavior, alpha wolves usually discourage breeding by subordinate wolves. In this account a subordinate female mated with the alpha male and was subsequently chased from Isle Royale twice. She was injured the second time, but in both cases returned, at least temporarily to the pack.			
83	Peterson, Rolf O.	1979	The wolves of Isle Royale -- new developments IN: Klinghammer, E. (editor). The behavior and ecology of wolves proceedings of the Symposium on the Behavior and Ecology of Wolves. May 23-24, 1975, Annual Meeting of the Animal Behavior Society, Wilmington, NC.	ISRO
	Reports on developments in the population dynamics of Isle Royale's wolves which occurred in the late 1960s through the mid 1970s. More than one wolf pack existed during this time frame and the wolf population increased. Moose kill rates increased and carcasses were underutilized. Also reports on human-wolf interactions. Wolves use trails on Isle Royale as travel routes during the spring and fall seasons, but avoid using trails during the visitor season, as indicated by the presence or absence of wolf scat on the trails.			
84	Peterson, Rolf O.	1980	Record-high wolf density on Isle Royale	ISRO
	Provided in this short report is a record of recent wolf population trends from 1969 through 1980.			
85	Peterson, Rolf O.	1984	Ecological studies of wolves on Isle Royale - annual report 1983-1984 (covering the twenty-sixth year of research)	ISRO
	In 1983-84 the wolf population of Isle Royale stood at 24, in spite of considerable turnover and changes in all three wolf packs. All three packs reproduced in 1983. The 1984 population showed a 39-43% mortality among animals present in 1983. Territorial overlap and conflicts continued in 1984; the Harvey Lake alpha female was killed by the West Pack II during the winter study. The moose population appears to have declined slightly to less than 800 animals, although the long-term trend for moose is expected to remain upward. A reduced cohort of 1983 calves appears to explain the slight decline. It remains to be seen if lower recruitment resulted primarily from loss to wolves or if it is partially attributable to the very young age structure of the population. Midwinter mortality to wolves continues to be very low, with wolves relying largely on old adult moose exhibiting a very high incidence of arthritis. The 1983 calves continued to exhibit the low vulnerability to wolves in winter that has been characteristic of recent cohorts. We expect continued growth of the moose population in spite of a lower rate of increase caused by wolf predation.			
86	Peterson, Rolf O.	1985	Ecological studies of wolves on Isle Royale, final report - 1985 (covering the twenty-seventh winter study)	ISRO
	This is a summary of the 27th annual winter study of wolves and moose in Isle Royale National Park. The wolf population of 22 animals remained partitioned into 3 packs. The estimated moose population increased in 1985 to 1062 animals. Radio-collared moose were utilized to assess sightability of moose on census plots.			
87	Peterson, Rolf O.	1985	Ecological studies of wolves on Isle Royale - annual report 1984-1985 (covering the twenty-seventh year of research)	ISRO
	During its 27th year this study remained focused on wolf-moose interaction, with an additional goal of understanding the link between moose forage levels and population dynamics. The research involves three levels of this ecosystem: carnivore, herbivore, and vegetation. In 1985, the wolf population at Isle Royale changed little in total size from 1984. The wolf population has been stabilized by relatively high mortality of undetermined cause. The moose population is increasing steadily as recruitment remains relatively high and mortality low. Seventeen moose were radio-collared during the past year as part of a study of moose foraging behavior. The beaver population continued to increase during 1982-84 after reaching a low level during the peak in wolf numbers in 1980.			

88	Peterson, Rolf O.	1986	Ecological studies of wolves on Isle Royale - annual report 1985-1986 (covering the twenty-eighth year of research)	ISRO
	Mechanisms of population regulation for Isle Royale wolves and moose remain the central interest in the long-term continuing study now entering its 29th year. Wolves on Isle Royale decreased slightly to 20 individuals in 1986 as one of the three territorial packs was displaced completely by a dominant pack. Survival rate for wolves present last year was 77%, not counting an adult female wolf killed by a pack during the winter study in 1986. Moose numbers in 1986 were estimated at 1025 (+/-) 108. The moose population has generally increased since 1982, although the rate of increase has apparently been slowed by wolf predation. Calf survival has remained relatively high since wolves crashed in 1982, and moose mortality is stable at a low level. Comprehensive studies of moose foraging and activity patterns in both winter and summer were completed, and the collared moose enabled researchers to determine the "sightability" of moose during the midwinter census, that is, the proportion of existing moose that are actually seen and counted on plots. Under present conditions, moose sightability during our winter census ranges from 75-95%.			
89	Peterson, Rolf O.	1987	Ecological studies of wolves on Isle Royale - annual report 1986-1987 (covering the twenty-ninth year of research)	ISRO
	Wolves declined while moose and beaver increased during 1987-1987, the 29th consecutive year of research into wolf-moose dynamics at Isle Royale. Wolf numbers stood at only 16 in 1987. Mortality rate for the wolves present last year was 40-45%, very high for a protected wolf population. The nature of this mortality is unknown, but low kill rate, extensive trespassing, and continued interpack conflict all point to a chronically low food supply. Only two wolf packs persisted through the 1987 study. The moose population was estimated at 1380 (+-) 204, suggesting a substantial increase over last year. Calf recruitment in 1986 was strong, especially on the east ends of the island where wolf density has plummeted within the last two years. Overall, moose mortality is low. Radio-collared moose were used in 1987 to continue an assessment of moose "sightability" on census plots, or the proportion of moose seen and counted on plots.			
90	Peterson, Rolf O.	1988	Ecological studies of wolves on Isle Royale - annual report 1987-1988 (covering the thirtieth year of research)	ISRO
	In the 30th year of research focusing on population regulation in this isolated wolf-moose system, wolves declined for the fifth consecutive year, reaching the lowest level ever documented (12 animals). Variations in available food in winter have, in the past, adequately explained wolf population fluctuations. However, disease and/or limited genetic variability may be contributing to current declines in this isolated population. In order to evaluate these possibilities before further decline occurs, in 1988 several wolves will be live-trapped, blood-sampled for disease and genetics studies, and released wearing radio-collars with mortality sensors. The moose population continued its upward spiral (1,653 individuals), impeded little by wolf predation. This was the highest moose estimate ever obtained from aerial census of this population, and moose numbers are probably at least comparable to those of 20 years ago. There was an impressive increase in the number of snowshow hares in virtually all parts of the island.			
91	Peterson, Rolf O.	1989	Summary of discussions and findings, wolf population and viability meeting	ISRO
	A meeting was held in Minneapolis to discuss findings from a study of the decline of wolves at Isle Royale National Park. The Isle Royale wolf population reached an all-time low of 11 individuals in 1989. The objective of intensified wolf studies at Isle Royale is not to save this population but rather to gain new knowledge applicable to problems involving small population viability. The current wolf decline appears to result primarily from reproductive failure although several other factors could be involved.			
92	Peterson, Rolf O.	1989	Ecological studies of wolves on Isle Royale - annual report 1988-1989 (covering the thirty-first year of research)	ISRO
	Isle Royale wolves declined for the fifth consecutive year, reaching an all-time low of 11 animals in 1989. The decline, while not as great as expected, continues to result from inadequate reproduction. With the entire population at risk, more intensive studies were initiated during the past year. For the first time, Isle Royale wolves were handled, live-trapped, blood-sampled, and released wearing radio collars. Blood samples were used for disease and genetics testing. Blood antibodies revealed that some of the wolves had been exposed to two diseases, canine parvovirus and Lyme disease. Genetics studies are very preliminary but early results are consistent with the idea that the entire population arose from a single colonizing female with no subsequent immigration of successful reproducers. The wolves examined were all closely related and loss of genetic variability may be substantial. The moose population was estimated at 1,397 (+-) 211 in 1989, suggesting that growth ceased during the past year. Malnutrition was prevalent among dead moose examined in 1989, probably because of heavy infestation by winter ticks coupled with above-average snow depth and scarce forage.			

93	Peterson, Rolf O.	1990	Study of causes of wolf decline at Isle Royale National Park	ISRO
	In March, 1988, the wolf population of ISRO contained only 12 individuals, following a five year decline. The wolf population faces an accelerating probability of extinction as numbers drop progressively below 20, based on a simulation model developed by T. Drummer and R. Peterson. Since the population is clearly at risk from unknown causes, in 1988 a two year study was undertaken to evaluate possible causes for the wolf demise. Possible factors involved were decline in food supply, mortality from disease, and loss of genetic variability. Stochastic events could effectively wipe out the remaining population. This study was designed to evaluate the disease and genetics hypotheses and to determine causes of mortality. There was no indication of food shortage, since all the wolves handled at Isle Royale during 1988 and 1989 were considered to be in good to excellent condition. The 1988 data from ISRO wolves provided the first documentation that both Canine Parvovirus and Lyme disease are present on the island. Genetics findings are consistent with (but do not yet confirm) the hypothesis that loss of genetic variability is causing reproductive failure.			
94	Peterson, Rolf O.	1990	Ecological studies of wolves on Isle Royale - annual Report 1989-1990 (covering the thirty-second year of research)	ISRO
	The wolf population on Isle Royale National Park increased slightly to 15 animals in 1990, reversing a 5 year decline and was the result of an unprecedented lack of mortality. Intensified studies of wolves continued in 1989 in order to better understand the factors involved in the recent wolf decline. Seven wolves have now been live-captured and blood-sampled for disease and genetics studies, and were released wearing radiocollars. Genetic loss through inbreeding has the strongest support as an explanation for the wolf decline. Lyme disease effects on wolves remain unknown. While canine parvovirus (CPV) raised initial concern in 1988, we have found no evidence that CPV is currently a problem. The moose population was estimated at 1,216 (+-) 163, after a 25% decline in the last two years. Heavy mortality in 1989 was attributed to the influence of winter ticks, and recruitment of calves was relatively low.			
95	Peterson, Rolf O.	1991	Ecological studies of wolves on Isle Royale - annual report 1990-1991 (covering the thirty-third year of research)	ISRO
	This report summarizes the results of the 33rd year of field studies on Isle Royale, including summer moose studies. The report primarily describes wolf movements and population status during the winter studies. The 1991 wolf population dropped to 12 animals, equaling the lowest level recorded since studies began in 1959. As part of an intensified study to understand causes of the wolf decline, 8 of the 12 wolves alive in 1988 have now been live-captured, blood-sampled for disease and genetic studies, and released wearing radio collars. During the past year we have found no evidence that disease is currently an important factor in wolf dynamics, and their food supply should be increasing annually as the moose population ages. Loss of genetic variability and inbreeding in this small population may explain the low reproduction which currently endangers these wolves. In 1991 the moose population was estimated at 1313 (+-) 303, or about 2.4 moose/km^2, suggesting that the population has stabilized after a 25% decline attributed to the influence of winter ticks. With wolves at such a low level, moose are expected to persist at high density until other sources of mortality intervene.			
96	Peterson, Rolf O.	1992	Ecological studies of wolves on Isle Royale - annual report 1991-1992	ISRO
	During 1991-92 the Isle Royale wolf population remained at the all-time low of 12 individuals, the same as the previous year. Two wolf pups were produced in one pack and two wolves died, resulting in no net change in population size. Three territorial packs continued to partition the Island, and an additional breeding pair formed during late February. There was no turnover or mortality among the four male-female pairs from last year. Two additional wolves were radio-collared in 1991. The number of old moose in the population is now increasing rapidly, so if wolves are food-limited they should increase in number within two years. If not, genetic deterioration will remain as the likely cause for low reproduction. The moose population increased to about 1600 animals in 1992, approaching the highest level in four decades. Calf abundance in mid-winter was moderately high. However, moose calves were generally small, in poor condition, and highly vulnerable to wolves. High wolf predation on calves, and winter ticks, though less predictable than wolf predation, is a significant mortality factor for moose.			
97	Peterson, Rolf O.	1993	Ecological studies of wolves on Isle Royale - annual report 1992-1993	ISRO
	On Isle Royale during 1992-93, moose continued to increase and the wolf population remained almost unchanged. Only 13 wolves were present early in 1993, including two pups in one pack. Only one wolf died in the past year thus reproduction was sufficient to maintain wolf numbers. The single reproducing pack increased to seven members, whereas the other two packs remained at two wolves each. In the past five years wolf exposure to canine parvovirus appears to have diminished; there is no evidence that disease is contributing to low reproductive success on Isle Royale. Wolf food supply is now expanding rapidly, as large cohorts of moose born in the early 1980's reach a vulnerable age. Reduced genetic variability and a high degree of relatedness among the wolves suggest that inbreeding depression has led to an unusually low reproductive rate. New outbreaks of disease and total loss of females are now the greatest immediate risks. The moose population continued to grow in the past year and is now at its highest level in almost 60 years.			

98	Peterson, Rolf O.	1994	Ecological studies of wolves on Isle Royale - annual report 1993-1994	ISRO
	In 1993-94 wolf and moose populations at Isle Royale both increased. Wolf numbers reached 17 in Jan. 1994, highest since 1987. Two of the three packs reproduced, each raising 4 pups. Eleven of 15 wolves surviving in March 1994 were three years old or less. This younger generation contains both males and females. Improved reproduction in the wolf population calls into question the hypothesis that poor reproduction in this small population was caused by inbreeding. Wolf food supply (old moose) began increasing in the early 1990s, and wolves may be responding to improved food supply, in spite of genetic losses. The moose population continues to slowly grow. Mortality during the 1994 study included some losses to accidents and malnutrition, but wolves killed 70% of the moose recovered in winter. Winter ticks were not abundant in 1994, and the moose population will probably continue to grow until it is stopped by increased wolf predation, ticks, or winterkill.			
99	Peterson, Rolf O.	1994	Study of wolf decline, Isle Royale National Park	ISRO
	The chapters in this volume represent the final report of a six year study of a declining population of gray wolves at Isle Royale National Park. This report consists of published papers or chapters which have been prepared for submission to scientific journals. The scientific objective of this effort was to uncover causes of a chronic and unexpected decline in the wolf population. The wolf decline on Isle Royale is believed to have resulted from a combination of human-introduced disease and inbreeding depression. In the final chapter, the author makes management recommendations to introduce wolves from the mainland to ISRO when no pups are seen for one year, or litter size is less than three pups for any daughters of the current breeding female, to attempt to increase genetic variability and restore normal reproduction.			
100	Peterson, Rolf O.	1995	The wolves of Isle Royale - a broken balance	ISRO
	In this book, Dr. Peterson has tried to portray what is known about the decline in the Isle Royale wolf population that began in the 1980s. Included in this description of the ecology of the wolves and moose at Isle Royale are many personal stories of encounters, glimpses, and awe-inspiring moments during his nearly 30 years of study on Isle Royale. The last chapters of the book have a more philosophical tone, commenting on what should or should not be done to augment the current wolf population or what should be done if the current population becomes extinct.			
101	Peterson, Rolf O.	1995	Wolves as interspecific competitors in canid ecology	ISRO
	This review focuses on the mechanisms of competition between wolves and other canids and the resulting effects on distribution and abundance of other canids. Pertinent here is the role of modern humans in influencing canid species prevalence. This paper is limited to competition among North American canids, especially wolves, coyotes, and red foxes. New data is presented on wolf-red fox interaction from Isle Royale National Park and other areas.			
102	Peterson, Rolf O.	1995	Ecological studies of wolves on Isle Royale - annual report 1994-1995	ISRO
	In 1994-95 the wolf population at Isle Royale remained stable (16 wolves in Jan. 1995), while the moose population increased to 2,400. Annual wolf mortality was near the long-term average and reproduction fell back to the low level prevalent since the late 1980s. Only one of the three territorial packs reproduced, yielding two surviving pups. Wolf food supply (old moose) will increase steadily during the 1990s. If the next generation of wolves reproduces at rates similar to the last, then genetic decay will probably remain the only reasonable explanation for low reproduction which is preventing expansion of wolf numbers. There was little starvation mortality in spring 1994. During the 1995 winter study we recorded a few moose deaths from malnutrition and accidents, but wolf predation was responsible for almost 90% of the moose mortality. The wolf decline of the 1980s and 1990s revealed the importance of wolf predation in the dynamics of the Isle Royale "ood chain. The ecological significance of top carnivores in terrestrial food chains has probably been underestimated because they have been extirpated or reduced in number by human actions.			
103	Peterson, Rolf O.	1996	ISRO wolf observations - 1996	ISRO
	Records wolf observations during the 1996 Winter Study period from January 15, 1996 through February 28, 1996. Information recorded includes date, number of wolves, pack information, location, remarks (activity), and observer’s initials.			

104	Peterson, Rolf O.	1996	Ecological studies of wolves on Isle Royale - annual report 1995-96	ISRO
	Dramatic changes occurred at Isle Royale in the past year, with wolves increasing to their highest level in over a decade (22 individuals) while the moose population crashed from lack of food (to about 1200 individuals). The wolf population included seven pups distributed in all three territorial packs. Notably, the first litter of pups born to wolves of the next generation was of normal size, with four pups surviving to winter. Three pups survived in the other two territorial packs. Wolf age structure is now dominated by young wolves with high expected survival rates and reproductive potential. Reproductive potential of the next generation of wolves will provide a test of the consequences of inbreeding in this population. In the moose population, low calf survival and retarded body growth in calves were evident in summer 1995, and high loads of winter ticks were already causing hair loss in January, 1996. Deep snow aggravated a severe shortage of winter forage, and the combined impact of these conditions led to the highest moose mortality rate of the past 38 winters. The moose population should continue to decline from the historic high level recorded in 1995.			
105	Peterson, Rolf O.	1996	Travels and kills - 1996	ISRO
	Records information pertaining to wolf travels and kills gathered during the 1996 Winter Study period from January 14, 1996 through February 28, 1996. Information recorded includes date, travel, kills covered, location, kill identification number, social ties, and kill coverage (no travel) for each of the three wolf packs.			
106	Peterson, Rolf O.	1997	Ecological studies of wolves on Isle Royale -annual report 1996-1997	ISRO
	The aftershocks of the moose crash during the winter of 1995-96 continued well into May 1996, when delayed arrival of spring caused an extended period of starvation for moose. Only 500 moose survived at census time in February 1997, down from 2400 in 1995. Wolves managed a modest increase in the past year, from 22 to 24 animals, including seven surviving pups distributed among two territorial packs and a new breeding pair. Moderate reproduction in the wolf population was almost offset by increased mortality. Even with very abundant food during the first half of 1996, no wolf pack brought through more than 3 pups to winter 1997, and one territorial pack contained no pups. During 1997 kill rates of moose were near normal for territorial packs, but it was clear the wolves were having difficulty finding prey. A record 175 dead moose were examined in 1996, with starvation the most common cause of death. The 1996 cohort of moose calves was small in stature and abundance, comprising only 3% of the moose population in winter 1997. Wolf: moose ratio has increased seven-fold in the past two years, and wolf predation may now limit moose population increase.			
107	Peterson, Rolf O.	1998	Ecological studies of wolves on Isle Royale - annual report 1997-1998	ISRO
	After several years of steady population increase, the wolf population unexpectedly declined from 24 to 14 individuals. Acute food shortage due to the moose die off in 1996 is likely a cause of the wolf decline. The wolf population contained three territorial packs plus one nonterritorial pair. Most of the moose population on Isle Royale now lives within the territory of one wolf pack. Moose kill rates this past winter were relatively low; wolves killed primarily the moose calves. The wolves took advantage of the warm winter conditions to hunt beaver. The moose population increased to 700 animals. The remains of moose that died in the severe winter of 1996 have been examined and results are reported. This annual report also reports on other wildlife species, including a study of deer mice and observations of red fox, bald eagles, osprey, and pine marten.			
108	Peterson, Rolf O.	1999	Ecological studies of wolves on Isle Royale - annual report 1998-1999	ISRO
	Following a year when more than half the wolves died on Isle Royale, the wolves rebounded in 1999 at the highest rate ever documented, increasing from 14 to 25 wolves. The sudden drop the previous year was apparently a short-lived echo of the moose die-off in 1996. All four wolves captured live in 1997 and 1998 were disease-free. The wolf population continued to live in three territorial packs; with all three packs producing pups in 1998, and two packs brought six pups through to winter. Only one adult wolf died during the previous year, apparently killed by other wolves in a territorial dispute. Heavy wolf predation, a significant load of winter ticks, and unusually hot summer weather combined to keep moose numbers from rising very much (from 700 in 1998 to 750 in 1999). There are now enough wolves (30 moose: 1 wolf) on Isle Royale to limit the rate of increase for moose and we expect the vegetation to recover somewhat. The beaver population has continued a long-term decline that reflects poor habitat as the forest matures after disturbance by fires in 1936 and during the 19th century.			

109	Peterson, Rolf O.	2000	Ecological studies of wolves on Isle Royale	ISRO
	On Isle Royale, the wolf population continued to increase during the past year, from 25 to 29 wolves, and in 2000 it was higher than in any point since 1980. Mortality during the past year was exceptionally low. The wolf population is apparently being restructured, from three territorial packs to just two. The Middle Pack (with up to 12 wolves) and the East Pack (now 10 wolves) together claim the entirety of the island. Moose on Isle Royale were little affected by winter conditions in 1999-2000, but winter ticks prompted by warm spring and summer weather in 1998 appeared responsible for malnutrition deaths recorded in late winter and spring 1999. Calf abundance in winter 2000 was exceptionally low (6%), and the population was estimated at 850 moose, up slightly from the 1999 estimate. Plant species favored by moose have enjoyed more favorable growth conditions since 1996, when over three-quarters of the moose population died of starvation, yet some woody plants may not recover normal vigor because of previous overbrowsing.			
110	Peterson, Rolf O., Dietz, James M., Allen, Durward L.	1971	Ecological studies of the wolf on Isle Royale, first annual report (covering the thirteenth year in the Isle Royale studies) 1970-1971	ISRO
	This report includes summer observations from 1970, focusing primarily on moose observations. Moose pellet lines were run; moose carcasses were located and specimens were collected; sex-age sampling of the moose herd was determined; the presence of the great aspen leaf roller (*Archips conflicatana*) was determined; increased beaver activity was noted. During the winter study period in 1971, bird sightings and sightings of secondary species of mammals were recorded. The probable number of wolves as observed during the winter study period was 19; this number was divided among two larger packs, 4 loners, and 3 sets of pairs. Included are reports on wolf observations and behavior observations. Moose distribution and predation relative to snow depth is discussed. Predation of moose is discussed and statistics are presented. The fat content of the bone marrow of dead moose was studied and findings are discussed. Aging individual moose by counting cementum annulations of incisiform teeth is discussed.			
111	Peterson, Rolf O., Allen, Durward L.	1972	Ecological studies of the wolf on Isle Royale - second annual report (covering the fourteenth year in the Isle Royale studies), 1971-1972	ISRO
	This report summarizes the second year of study on Isle Royale by Rolf O. Peterson, who began work in June 1970. The research effort focuses primarily on wolf ecology and features wolf-moose relationships. The wolf population was dominated by two packs, West Pack (7+1); East Pack (10, numbering 7, 8, and 9 on occasion); Malone Bay Trio (3); and loners (2), for a probable total population of 23. During the winter study of 1971 the wolves had killed more moose than in any previous winter study (a total of 44 moose killed by wolves); 24 (53%) of these were moose calves born in 1970. During the summer of 1971, some moose were examined that appeared to have died from malnutrition. According to the winter census, there was no significant change in the moose population since the last census in 1970. An estimated total population of moose is 871 (+/-) 233.			
112	Peterson, Rolf O., Allen, Durward L.	1973	Ecological studies of the wolf on Isle Royale - third annual report (covering the fifteenth year in the Isle Royale studies) 1972-1973	ISRO
	Summarizes the fifteenth year of study on Isle Royale National Park, directed primarily towards wolf ecology and the wolf-moose relationship. Summer field work included examining remains of dead moose encountered, and stimulating howling responses from wolves. Routine information was collected on all live moose encountered to furnish information on population characteristics, including reproductive success. Other species observed during the summer field work period are described, including the third consecutive summer of aspen defoliation by the great aspen leaf roller, (*Archips conflictana*). Warm winter temperatures and unstable ice affected the number of flight hours during the winter study period. The moose population was not estimated in this report; the wolf population estimated to be 24 animals. Observations on the age of wolf-predated moose and the percentage of moose calf killed are included in this report. Two main wolf packs were present this winter along with one loner and a duo of wolves. Breeding observations are recorded as are observed moose-wolf encounters. Snow studies and effects on the wolves and moose are discussed.			
113	Peterson, Rolf O., Allen, Durward L.	1974	Ecological studies of the wolf on Isle Royale - fourth annual report (covering the sixteenth year in the Isle Royale studies), 1973-1974	ISRO
	This report summarizes the Summer, 1973 and Winter, 1974 wolf/moose field work on Isle Royale. The summer work included collections of moose remains and of quantification of wolf scats on hiking trails (as an indication of wolf avoidance of trails when humans use the trails). Examination of scats showed the importance of beaver as a summer food item for wolves. During Winter Study the wolf population was estimated at 31, partitioned into the two packs, one duo, and one loner. This was the highest wolf population recorded since these systematic studies began on Isle Royale in 1959. Excellent pup survival in the two packs was attributed to the ample availability of moose calves and beaver during the 1973 rearing season. The West Pack split into four groups by late winter, probably due to a change in leadership. The 1974 aerial moose census estimated the population at 875, slightly more than the last census in 1972. Based on results from Alaska, which show that such aerial estimates are at least 20% low, a recalculation of moose numbers for 1972 and 1974 places both estimates near 1000.			

114	Peterson, Rolf O., Allen, Durward L.	1975	Ecological studies of the wolf on Isle Royale, 1974-1975	ISRO
	This report summarizes the summer field work carried out in 1974 including moose observations, moose mortality, and summer wolf activity. This report also includes information regarding the winter field work carried out in 1975 including, wolf population description, winter moose mortality, other moose research, secondary species of mammals, winter birds, and snow studies. Included is a section titled "Beaver Studies, 1973 and 1974" by Philip C. Shelton (pages 17-20). Information on Isle Royale beavers was up-dated through aerial surveys, live trapping, and studies of food utilization and availability.			
115	Peterson, Rolf O., Allen, Durward L.	1976	Ecological studies of the wolf on Isle Royale - annual report (covering the eighteenth year in the Isle Royale studies), 1975-1976	ISRO
	In 1975, Isle Royale wolves produced at least 10-12 pups. The peak population of 44 wolves recorded in 1976 is the highest ever recorded on ISRO and represents the highest wolf densities documented anywhere. One instance of intraspecific strife recorded, resulting in the death of two wolves from a trespassing pack. 1976 kill rates were the highest recorded on ISRO over the past 18 years, with slightly more than one moose/day being killed by wolves. The Isle Royale moose population is undoubtedly decreasing, since calculated mortality rates have exceeded adult recruitment rates for the past three years. The author’s best estimate of decline in the moose population over the last three winters is 20%, imploying a pre-parturition total of about 800 moose.			
116	Peterson, Rolf O., Krumenaker, Robert J.	1989	Wolf decline on Isle Royale: a biological and policy conundrum; George Wright Forum	ISRO
	The wolf population at Isle Royale National Park, Michigan, is currently declining rapidly and may be close to extinction. Declining wolf numbers since 1983 were attributed to high mortality (greater than 40% per annum) and low reproduction, but studies based on observation alone did not reveal specific causes of mortality. Aside from a documented food shortage, disease and loss of genetic variability might explain the population demise. In a departure from previous study techniques, in 1988 wolves were live-trapped, blood-sampled, and released wearing radiocollars. Technical and philosophical issues associated with this study are reviewed, as well as management options in response to likely extinction of wolves on Isle Royale.			
117	Peterson, Rolf O., Krumenaker, Robert J.	no date	Wolves approach extinction on Isle Royale: a biological and policy conundrum	ISRO
	The wolf population at Isle Royale National Park is currently declining rapidly and may be close to extinction. Declining wolf numbers since 1983 were attributed to high mortality and low reproduction, but studies based on observation alone did not reveal specific causes of mortality. Aside from a documented food shortage, disease and loss of genetic variability might explain the population demise. In a departure from previous study techniques, in 1988 wolves were live-trapped, blood sampled, and released wearing radiocollars. Technical and philosophical issues associated with this study are reviewed, as well as management options in response to likely extinction of wolves on Isle Royale.			
118	Peterson, Rolf O., Morehead, John M.	1980	Isle Royale wolves and National Park management; IN: Proceedings of the 2nd Conference on Research in National Parks Nat'l Tech Info Serv, Washington, DC	ISRO
	Isle Royale National Park supports one of two well-established populations of eastern timber wolves in the U. S. and has been designated as "critical habitat" for this species. Research over the past 20 years has documented the primary importance of wolf predation in the population dynamics of the Isle Royale moose. A priority goal of park management is to protect wolf activity from human disturbance. Wolves continue to exhibit pronounced avoidance behavior toward humans, even though totally protected during their 30-year history on Isle Royale. Research has documented wolf avoidance of hiking trails during the visitor season and the influence of human activity on the location of wolf dens and rendezvous sites. The influence of wolves on park management is discussed, including park management philosophy, campground and trail development, appropriate backcountry use, research techniques, and park closure during winter.			
119	Peterson, Rolf O., Page, Richard E.	1985	Ecological studies of wolves on Isle Royale (final report - 1985)	ISRO
	Describes the 27th annual winter study of wolves and moose on Isle Royale. The wolf population was found to have changed little from 1984. The wolf population of 22 animals remained partitioned into 3 packs, but evidently only 2 reproduced in 1984. The moose population was 1062, a considerable increase over the 1984 estimate. Radio-collared moose were utilized to assess sightability of moose on census plots in 1985.			

120	Peterson, Rolf O., Page, Richard E.	1987	Wolf density as a predictor of predation rate; Swedish Wildlife Research	ISRO
	Total loss of moose to wolf population was measured in midwinter from 1975 to 1984 at Isle Royale National Park. This paper presents a preliminary examination of wolf kill rates, focusing on the relationship between wolf predation impact and wolf numbers.			
121	Peterson, Rolf O., Page, Richard E.	1988	The rise and fall of Isle Royale wolves, 1975-1986; Journal of Mammology	ISRO
	The wolf (*Canis lupus*) population in Isle Royale National Park, Michigan, increased steadily in the 1970s, reaching a peak of 50 wolves in 1980. A population crash followed in 1980-1982, then wolf numbers stabilized at 20-24, the same level as during the 1960s. After a lag of 2-3 years, wolf density followed trends in moose (*Alces alces*) mortality rate, which was correlated with wolf-pack food supply. The increase in numbers of wolves resulted from proliferation of reproducing packs when food became more abundant in the early to mid-1970s. Equilibrium was reached in 1983-1986. For 2 years before the 1980-1982 crash, dispersal of individuals from packs was high resulting in smaller pack size. Known mortality during the decline took the form of starvation and intraspecific killing, direct and indirect manifestations of reduced food supply.			
122	Peterson, Rolf O., Page, Richard E., Stephens, Philip W.	1982	Ecological studies of wolves on Isle Royale - annual report 1981-1982 (covering the twenty-fourth year of research)	ISRO
	This report summarizes the wolf - moose research on Isle Royale for 1981-82. In 1982 only 14 wolves remained on the Island; the lowest level since they arrived on Isle Royale in the late 1940's. The dominant pack of four wolves claimed almost the entire Island. Three other breeding pairs and four single wolves were also found. A complete turn-around in wolf food availability was seen, and all groups of wolves had ample food. Only two years ago (1980) the historic high of 50 wolves was segregated into five packs. Changes in the moose population, probably prompted by the wolf decline, were no less dramatic. Swelled by almost 200 calves, the moose population increased to over 700 in 1982. A substantial rebounding of moose is certain if subsequent cohorts of calves match that born in 1981. If wolves exhibit a moderate rebuilding of numbers within a couple years, as we expect, this predator-prey system should soon approximate that described 25 years ago. Accumulating evidence suggests that we are witnessing a predator-prey cycle with an extended period of fluctuation. Other species observed during this winter study period include otter, beaver, fox, and gyrfalcon.			
123	Peterson, Rolf O., Page, Richard E., Vucetich, J. A.	no date	Wolf population dynamics and prey age structure in Isle Royale National Park; IN: study of wolf decline, R O Peterson, 1994 Chapter 8	ISRO
	At large spatial and temporal scales wolf density is broadly correlated with prey density, consistent with expectations for a top carnivore. Yet during a 2-decade period annual fluctuations of wolf numbers in ISRO were not similar to fluctuations in moose, their primary prey. Moose population level was estimated from reconstruction based on recovery of dead animals (1959-1982), on aerial surveys (1983-1993), and on simulations based on an empirical model of moose population rate of change (1994-2000). Population reconstruction was based on a field effort with an estimated recovery rate of 33%, employing corrections for seasonal bias in field effort, variable field effort, and moose yet alive. Wolf population level in 1959-1980 was best predicted by density of old moose, which provide 67% of prey biomass for ISRO wolves, including a lag of 2 years for wolf response. Wolf numbers >1980 were lower than expected based on food abundance, which reached a low point in ca. 1990 and is predicted to rise rapidly during 1990-2000.			
124	Peterson, Rolf O., Risenhoover, Kenneth L., Page, Richard E.	1984	Isle Royale wolf-moose ecology - summer report, 1984	ISRO
	During 1984 study efforts at Isle Royale concentrated on wolf-moose and moose-vegetation interactions. During the 1984 summer field season, reproduction was confirmed in two of the three existing wolf packs. Moose calf production and recruitment declined slightly from 1982 and 1983 levels, so only slight increase in moose population is possible in 1985. Fourteen moose were immobilized and outfitted with radio-transmitter collars to study moose foraging behavior which will be completed during the next two years. Recruitment of moose calves now exceeds adult mortality by about 5%; at that rate the moose population will double by the late 1990s.			

125	Peterson, Rolf O., Scheidler, Joseph M.	1977	Ecological studies of wolves on Isle Royale - annual report 1976-1977 (covering the nineteenth year in the Isle Royale studies)	ISRO
	This report summarizes the nineteenth year of field work investigating the wolf-moose relationships on Isle Royale National Park. The summer 1976 field season concentrated on examining and collecting remains of wolf-killed moose located during winter 1976 to determine age of moose taken by wolves. Moose herd composition and productivity were estimated by summer ground observations. Aerial survey conducted after October leaf-fall allowed a more accurate determination of calf production and recruitment. The 1976 calf crop was among the lowest recorded since 1970. Summer observations of wolves indicate a minimum of 8 pups alive on ISRO in late summer. Wolf observations during the 1977 winter study period indicate that this was the first year since 1969 that the wolf population did not increase and totaled 34 animals. One instance was observed of an ISRO wolf traveling to Canada across the ice this winter. Poor snow conditions precluded a reliable moose census in 1977, but the authors did note a substantial drop in the number of moose observed during routine flying.			
126	Peterson, Rolf O., Scheidler, Joseph M.	1978	Ecological studies of wolves on Isle Royale - annual report 1977-1978 (covering the twentieth year in the Isle Royale studies)	ISRO
	This report summarizes the twentieth year of field work investigating the wolf-moose relationships on Isle Royale National Park. The summer 1976 field season concentrated on locating and examining the carcasses of wolf-killed moose, determining primary wolf activity sites and the status of pups produced in the wolf population. Winter field work included a determination of the wolf population size, pack size, and social interaction of wolves. Wolf predation was observed and analyzed. The Moose population was quantified.			
127	Peterson, Rolf O., Scheidler, Joseph M., Shelton, Philip C.	1979	Ecological studies of wolves on Isle Royale - annual report 1978-1979 (covering the twenty-first year of research)	ISRO
	This report summarizes the twenty-first year of field work investigating wolf and moose ecology on Isle Royale National Park. For the past five years, Isle Royale has supported the most dense wolf population known to exist; 43 wolves were present on the island. The summer 1978 field work concentrated on locating and examining moose carcasses, and aspects of summer wolf ecology were studied, including food habits, location of rendezvous sites, and presence of pups. The moose population was estimated in both summer and fall, with calf abundance estimated at both times. Trends in moose mortality are discussed. Winter field work included counting the wolf population, examining territory and pack size, and observing wolf-moose interactions. The moose population census was completed during the winter study period, the first time since 1974. Direct counting of the plots yielded a preliminary estimate on 738 (+-) 16% moose, which when adjusted for sightability provided a final estimate of 826 moose during early February, 1979. Beaver studies involved aerial surveys, live trapping, and examination of colonies by ground; 156 sites were observed.			
128	Peterson, Rolf. O., Seal, Ulysses S., Krumenaker, R.J.	1989	Wolf disease and genetics in relation to the wolf decline on Isle Royale National Park, summary of discussions and findings	VOYA
	This report is a summary of discussion and findings from the march 1989 Wolf Population Viability Meeting. It is intended for distribution to meeting participants and sponsors only. Results of studies being completed on the wolf population decline of Isle Royale National Park are discussed in detail.			
129	Peterson, Rolf O., Shelton, Philip C.	1983	Ecological studies of wolves on Isle Royale - annual report 1982-1983 (covering the twenty-fifth year of research)	ISRO
	On Isle Royale, the rapid decline of the wolf population in 1980-82 was reversed, and wolf numbers now approximate the average level of the 1960s. In 1982, wolf pups were born to all four breeding females present in the population. Thirteen pups survived in three packs in winter 1983, bringing wolf numbers to 23. Territorial skirmishes continued, and the West Pack II claimed 2/3 of the Island. Wolf kill rates were relatively low and carcass utilization high, reflecting low vulnerability of moose in winter. The small size of some pups this winter may reflect a low food supply in summer. The author now believes that the present food supply will not be adequate to support continued survival and expansion of all three wolf packs. The current moose population is estimated at 900, including about 400 calves and yearlings. The moose calf cohort in 1982 was large, although proportionately lower than the record cohort of 1981. Wolves are now preying primarily on moose born during the late 1960s. These moose exhibit a much higher incidence of arthritis than moose born during periods of lower density.			
130	Peterson, Rolf O., Stephens, Philip W.	1980	Ecological studies of wolves on Isle Royale - annual report 1979-1980 (covering the twenty-second year of research)	ISRO
	This report summarizes the twenty-second year of wolf - moose research on Isle Royale. In 1980, the wolf population reached an all time high of 50 individuals, while the moose population was estimated at 650-700. Included is a description of the summer field work for 1979, including summer and fall moose surveys and summer wolf activity. Also included is the field work summary done during the 1980 winter study period, including analysis of the wolf population and the moose population. Other wildlife observed during this period include fox, otter, beaver, and one lynx.			

131	Peterson, Rolf O., Stephens, Philip W., Shelton, Philip C.	1981	Ecological studies of wolves on Isle Royale - annual report 1980-1981 (covering the twenty-third year of research)	ISRO
	This report summarizes the results of the 23rd year of field studies on Isle Royale including summer and winter moose studies. We primarily describe wolf movements and population status during the winter studies. The 1981 wolf population dropped from 50 to 30 individuals, the most dramatic wolf decline in the 23 year history of this research project which is attributed to a reduced food supply. Current effort in following the moose population dynamics is directed at a determination of moose density and population composition. Results of summer and fall moose population surveys are reported. The winter aerial census of moose revealed a population of 481 animals. Other species observed during the winter study period were beaver, otter, and fox. In October 1980, Shelton surveyed beaver colonies by air and ground and attempted to live-trap three colonies. The decline in numbers of colonies with food piles was essentially linear from 1974 through 1980. In 1980, there were 39 sites with fresh cutting or fresh mud on the house and 122 total sites with signs of activity.			
132	Peterson, Rolf O., Thomas, Nancy J., Thurber, Joanne M., Vucetich, John A., Waite, Thomas A.	1998	Population limitation and the wolves of Isle Royale; Journal of Mammalogy	ISRO
	The ecology and demography of wolves in Isle Royale National Park were examined during a sustained and unexpected population decline. After a population crash in 1981-82 that was attributed to food shortage, wolves continued to decline in 1984-88 because of unusually high mortality. This mortality ceased after 1988, but low reproductive success prevented recovery of the wolf population. Disease screening initiated in 1988 revealed declining evidence of canine parvovirus occurrence. This disease may have played a role in the population crash of 1981-1982 and may have contributed to the high mortality through 1988, but there appeared to be no disease involvement in the reproductive decline after 1988. Fewer breeding wolves, random demographic fluctuations (advanced age) may have contributed to poor reproduction. Wolf genetic characteristics support the hypothesis that reproductive success in this isolated population declined because of inbreeding depression, exacerbated by a population bottleneck in 1982, high mortality in 1981-88, and unequal reproductive success among alpha wolves both before and after the crash.			
133	Peterson, Rolf O., Thurber, Joanne M.	1990	Study of causes of wolf decline at Isle Royale National Park: progress report	ISRO
	In March, 1988, the wolf population of ISRO contained only 12 individuals, following an accelerating, five year decline. The wolf population faces an accelerating probability of extinction as numbers drop progressively below 20, based on a simulation model developed by T. Drummer and R. Peterson. Since the population is clearly at risk from unknown causes, in 1988 a two year study was undertaken to evaluate possible causes for the wolf demise. Three Possible factors involved were: 1) decline in food supply, 2) mortality from disease, and 3) loss of genetic variability. In addition stochastic events could effectively wipe out the remaining population. This study was designed to evaluate the disease and genetics hypotheses and, using radiocollars, to determine causes of mortality.			
134	Peterson, Rolf O., Thurber, Joann M.	no date	Dynamics of Isle Royale wolves during a chronic population decline, 1987-1993; IN: study of wolf decline, R O Peterson, 1994 Chapter 9	ISRO
	The ecology and demography of wolves in ISRO were examined during a sustained and unexpected population decline. After a population crash in 1981-82 attributed to food shortage, wolves continued to decline in 1984-88 because of unusually high mortality. When high mortality abruptly ceased >1988, however, poor reproductive success prevented recovery of the wolf population. Disease screening initiated in 1988 revealed the final stages of canine parvovirus, a disease that likely arrived by 1981. There was little support for hypotheses linking the wolf decline to relative food shortage or random demographic fluctuations. Wolf genetic characteristics support the hypothesis that reproductive success in this isolated population declined because of inbreeding depression, exacerbated by a population bottleneck in 1982, high mortality in 1981-88, and unequal reproductive success among alpha wolves both before and after the crash. By 1993 the population was at a precariously low level, with greatest extinction risks being the random elimination of one sex and a new cycle of disease.			

135	Peterson, Rolf O., Vucetich, John A.	2001	Ecological studies of wolves on Isle Royale - annual report 2000-2001	ISRO
	After many years of slow recovery, the wolf population on Isle Royale in 2000-01 abruptly dropped by a third, from 29 to 19 animals. Although five pups were raised in 2000-01 in three packs, mortality during the past year was unusually high. Last year's mild winter coupled with a simultaneous scarcity of moose calves may explain the high mortality. Wolf density on the east quarter of Isle Royale was over four times higher than in the western three-quarters, explained by a three-fold difference in moose density. Recruitment of calves from the 1999 cohort was low, but adult survival in the past year was relatively high. Calf abundance in winter 2001 (14%) approximated the long-term average, and the population was estimated at 900 moose. The winter of 2000-01 brought above average snow depths, leading to above average kill rate for wolves. Calf moose were particularly vulnerable, constituting two-thirds of the wolf-kills. Assuming there are no new diseases, we expect wolf numbers to recover, based on abundant food. The moose population should slowly climb for many years.			
136	Peterson, Rolf O., Vucetich, John A.	2002	Ecological studies of wolves on Isle Royale - annual report 2001-2002	ISRO
	During 2001-2002, the wolf population declined again on Isle Royale from 19 to 17 individuals, after dropping from 29 to 19 in the previous year. Pups were born in all three packs, but only two packs contained pups in winter 2002. Mortality during the past year (47%) was very high, possibly related to a shortage of old moose. Four wolves live-trapped and radio-collared in May 2001 were found to be disease-free and in good physical condition. Wolf pack territorial boundaries shifted as the Chippewa Harbor Pack took over East Pack area. Moose population has been slowly increasing. Calves made up 11% of the moose counted during the 2002 census (slightly above average), and moose population size increased to an estimated 1,100. Winter weather during the 2002 study was extremely mild, with less snowfall than in any of the previous 43 years. Continued increase of the moose population in the near future is anticipated, with annual variation related to weather patterns.			
137	Peterson, Rolf O., Vucetich, John A.	2003	Ecological studies of wolves on Isle Royale - annual report 2002-2003	ISRO
	During 2002-2003, the wolf population on Isle Royale increased slightly, from 17 to 19 individuals, while the moose population decreased slightly, from about 1,100 to 900, reflecting relative stability over the past three years. Three reproducing packs continue to occupy territories similar to those of 2002, although there was considerable turnover and poor reproduction in the East Pack, as its territory shrank in the face of challenge from the adjacent Chippewa Harbor Pack. An estimated seven pups survived in three litters, so five (29%) of the seventeen wolves present in 2002 perished, a mortality slightly above average. The moose population is currently very young, and wolf food supply (especially moose over 10 years old) will not increase until approximately 2007. Wolves were able to maintain midwinter kill rates at or above average levels. An outbreak of winter ticks led to higher moose mortality last spring, followed by reduced recruitment in the 2002 cohort. Another contributing factor was a late and cold spring in 2002. During the winter of 2002-2003, there were record-low snow depths, air temperature was unusually low, and wind speed was above average.			
138	Potvin, Marcel J., Drummer, Thomas D., Peterson, Rolf O., Vucetich, John A.	2000	Michigan gray wolf recovery annual report	PIRO
	Gray wolves were monitored in the Upper Peninsula of Michigan to provide a population estimate, to determine territory size and placement, and to evaluate habitat suitability. Data were collected using aerial telemetry, the Michigan Department of Natural Resources winter track survey, trapping and radiocollaring, howling surveys, and observations of wolf-killed deer.			
139	Potvin, Marcel, Peterson, Rolf	2000	Spring 2000 wolf trapping effort in Pictured Rocks National Lakeshore	PIRO
	The report describes the efforts to document wolf (*Canis lupus*) sign at Pictured Rocks National Lakeshore. Wolf sign only was identified 9 miles from the park boundaries. Traps were set outside of the park and wolves were not captured. It is assumed that wolf density in the park is low, and reliable sightings are a result of dispersal from a source population away from the park. A table documents the results of a howling effort in May of 2000. A map displays coyote (*Canis latrans*) howling responses and roads traveled in search of wolf sign.			
140	Robinson, William L., Groebner, Daniel J., Shultz, R. N.	1991	Foraging of gray wolves at a Great Blue Heron rookery; American Midland Naturalist	PIRO
	no abstract available			
141	Robinson, William L., Smith, G. L.	1977	Observations on recently killed wolves in Upper Michigan; Wildlife Society Bulletin	PIRO
	no abstract available			

142	Route, William T.	1989	Protocol for capture and restraint of gray wolves in and adjacent to Voyageurs National Park, Minnesota	VOYA
	The gray wolf is a federally listed threatened species in Minnesota and is an important component of Voyageurs National Park's fauna. Human activities within the wolves territories may have serious impact on the status of the wolf population. Radio tracking wolves in and adjacent to the park will facilitate understanding of wolf home ranges and population status as well as cases of mortality, rates of dispersal and the incidence of disease. This report details the proper procedures for capturing, immobilizing and handling wolves during radio-collaring activities and in various other situations.			
143	Route, William T.	1989	Wolf live-captures in the Voyageurs study area: spring, summer, and fall, 1989	VOYA
	From April to September of 1989 efforts to live-capture and radio-collar gray wolves within and immediately adjacent to Voyageurs National Park were made with some success. This report summarizes those efforts and includes a map depicting capture sites and probable home ranges of packs within the Park.			
144	Route, William T.	1989	Protocol for wolf howling surveys, Voyageurs National Park, Minnesota	VOYA
	This is actually an appendix to B. Route's "Wolf Howling Surveys in Voyageurs National Park, Minnesota, 1988 and 1989." It provides specific details on wolf howling survey methods, including data sheets and UTM coordinates for survey plots.			
145	Route, William T.	1990	Miscellaneous notes on wolves in Voyageurs National Park	VOYA
	Typed pages of notes and observations Bill Route (bio-tech) made during his five years at Voyageurs National Park on wolf pack locations and related activities. Map depicting various locations is attached.			
146	Route, William T.	1990	Wolf ecology studies At Voyageurs National Park: summary of winter field work, winters 1987-88 and 1988-89	VOYA
	Wolves in Voyageurs National Park were live-captured during several periods in 1987 - 1989 and fitted with mortality sensing radio-collars. Wolves were also ear tagged, weighed, measured, and blood samples were taken to quantify the prevalence of diseases, and endoparasites. This report provides details of the findings from the radio-telemetry, winter tracking, and serological tests.			
147	Route, William T.	1990	Wolf howling surveys in Voyageurs National Park, Minnesota, 1988 and 1989	VOYA
	"A wolf howling survey was initiated in Voyageurs National Park in 1988 as part of an on-going research program to develop a long-term monitoring program. The survey has two primary objectives 1) to identify rendezvous sites so they can be protected from development and recreational use, and 2) to detect trends in the wolf population and/or wolf pup survival." (excerpt from author's introduction). This report presents data and discussion from 1988 and 1989 howling surveys.			
148	Route, William T., Peterson, Rolf O.	no date	Population size and food habits of wolves in Voyageurs National Park during winter 1987-88	VOYA
	As the initial phase of an extensive examination of wolf (*Canis lupus*) ecology in and adjacent to Voyageurs National Park (VNP), Minnesota, the winter population size and food habits of wolves were studied from 1 January 1988 to 15 April 1988. The objectives of this study were to 1) estimate the number and home range size of wolf packs in and adjacent to VNP; 2) determine the sex, age, and condition of winter prey; 3) add to existing data on winter food habits of wolves in VNP ; 4) determine the extent of meningeal worm (*Parelaphostrongylus tenius*) infestation in white-tailed deer (*Odocoileus virginianus*); 5) identify the existence of disease (e.g. canine parvovirus) and parasitism (e.g. heartworm) in wolves; and 6) develop data forms and methods for ongoing radio-telemetry studies on the wolf population.			
149	Rykiel, E. J., Kuenzel, N. T.	1971	Analog computer models of "The Wolves of Isle Royale". IN: Patton, B.C. (ed.). Systems Analysis and Simulation in Ecology, Vol 1, Academic Press, NY, 607 p	ISRO
	Based on L. David Mech's study "The Wolves of Isle Royale" (Mech, 1966). This article attempts mathematical description and modeling of the plant-moose-wolf food chain described in Mech's 1966 study. The technique consists of applying various mathematical functions to define energy transfers within this system, and testing the behavior of the resultant systems against known aspects of reality.			

150	Schaberl, James P.	2001	Gray wolf management in the Lake Superior Region: Voyageurs National Park and Pictured Rocks National Lakeshore	PIRO
	The report discusses the results of the Voyageurs National Park/Pictured Rocks National Lakeshore wolf (*Canis lupus*) management and research project for 2000. Details on radio-collared wolves and wolf packs in Voyageurs National Park and efforts to document wolf sign in Pictured Rocks National Lakeshore are reported. Wolf density within Pictured Rocks is assumed to be low.			
151	Schaberl, James P., Lammie, Samuel R., Underwood, H. Brian, Lynch, Patrick J.	1997	Monitoring gray wolf and snowmobile activity on frozen lake surfaces: protected area management at Voyageurs National Park; making protection work: parks and reserves in a crowded, changing world - Abstracts from the 9th Conference on Research and Resource Management in Parks and on Public Lands	VOYA
	"Voyageurs National Park managers are directed to protect park resources while providing for appropriate visitor use in an arena of increasing political pressure to allow all contemporary recreational activity. Based on evidence that snowmobile use may disrupt wolf activity and in consultation with the USFWS in 1992, Voyageurs closed 17 major lake bays to winter motorized use. Results from a recent lawsuit opened the Restricted Use Areas (RUA) in 1996. From 1992-1996, the park documented winter wolf activity and snowmobile incursions in RUA through aerial monitoring. A GIS was used to analyze track activity of wolves and snowmobiles relative to the shoreline. New track events were compared with previous events to understand how activity changes over time. Despite regular wolf activity in some bays, wolf activity in RUA was generally absent during the same interval which snowmobile incursions were recorded. An interim rule to re-close some important lake bays to winter visitor use is likely. " (Abstract by Authors)			
152	Scheidler, Joseph M., Peterson, Rolf O.	1977	Ecological studies of the wolf on Isle Royale - summer field work, 1977	ISRO
	The primary objective of this study was to examine the remains of wolf-killed moose spotted from aircraft during the previous winter. Moose observed during the summer were counted and productivity estimated. Efforts were also geared toward locating primary wolf activity sites and determining the presence and number of pups produced by the major packs. In October, an aerial moose composition survey was conducted.			
153	Schmidt, James A.	1990	Food habits of the timber wolf in Voyageurs National Park	VOYA
	Food habits of the timber wolf in Voyageurs National Park, located in northern Minnesota, were investigated. Scats were collected along hiking trails and forest roads from January 1988 to August 1989. They were analyzed for prey species content at St. Cloud State University. A total of 204 scats were analyzed and 243 food items were found. White-tailed deer was the main food source making up 69%. Beaver occurred in 17% while others made up the remaining diet. Beaver was a good supplement for the wolf and proved very important on Kabetogama Peninsula especially along Cruiser Lake trail. Beaver comprised 57% of the diet in this area which made it the main food source. Voyageurs wolves are thriving and will continue to do so as long as the prey base holds steady.			
154	Schneeweis, James C., Greichus, Yvonne A., Linder, Raymond L.	1974	Organochlorine Pesticide Residue Levels In North American Timber Wolves -1969-71; Pesticides Monitoring Journal	VOYA
	"Tongue and muscle tissue samples taken from 51 timber wolves captured in Minnesota and Northwest Ontario in 1969-71 were analyzed for organochlorine pesticide residues in an attempt to determine the level of insecticide contamination in their environment. No determined residue levels exceeded the minimum analytical confidence limits established in a previous study by one of the authors."			
155	Seal, Ulysses S., Mech, L. David, Van Ballenberghe, Victor	1975	Blood analysis of wolf pups and their ecological and metabolic interpretation; Journal of Mammalogy	VOYA
	"Blood samples were obtained from 32 wolf (*Canis lupus*) pups live-trapped over a three-year period in northern Minnesota. The results of 21 laboratory analyses of hematology and blood chemistry are tabulated and analyzed in terms of the study area, age, sex, and year of collection. Mean values are compared to those reported for dogs in the same age group. The numerous differences between dog and wolf pups are interpreted in terms of nutritional levels and dietary composition with the suggestion that the wolves are not achieving their full growth potential." (Excerpts from author's abstract)			
156	Shevlin, Charles E.	1951	Introduction of wolves at Isle Royale, National Park Service memo to director, region II	ISRO
	Comments for the Regional Director regarding the introduction of wolves to Isle Royale as a means to control the burgeoning moose population.			

157	Smith, R.	1983	Reader recalls unusual wolf experiment; Michigan Natural Resources Magazine	ISRO
	Letter to the editor of this magazine by a Michigan Department of Natural Resources Training officer describing relocation of wolves to Isle Royale in 1952.			
158	St. Croix National Scenic Riverway	1989	Gray wolf species location summary for the St Croix Riverway	SACN
	Supplied is a data sheet on species location along the Riverway from observations made from 1987 to 1989. The gray wolf (*Canis lupus*) is a very uncommon species along the Riverway, and is listed as endangered in Wisconsin and threatened in Minnesota. Information provided includes the date, state, county, location, observer, and notes. Also included are sections of articles relating to this mammal (biology, ecology, etc.).			
159	Stebler, A. M.	1944	The status of the wolf in Michigan; Journal of mammalogy	PIRO
	The article discusses the decline of gray wolves in Michigan during the early part of the 20th century.			
160	Stebler, A. M.	1951	The ecology of the wolf in Michigan	PIRO
	no abstract available			
161	Steinhart, Peter	1995	The company of wolves	ISRO
	Discusses what is and what is not known about wolves throughout the U.S., North America, and the World. Contains excerpts of interviews with L. David Mech and Rolf O. Peterson. Chapter 7 presents information about Rolf Peterson's early education and experiences that led to his participation in the moose-wolf project through Purdue University. This chapter goes on to discuss what has been happening with Isle Royale's wolf population since it crashed from 50 wolves in 1980 to 14 wolves in 1982. Other chapters contain information concerning Isle Royale's wolves and moose.			
162	Thiel, Richard P.	no date	Status of the timber wolf in Wisconsin: performance report: October 1, 1987 to September 30, 1988	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
163	Thiel, R. P.	1988	The dispersal of a Wisconsin wolf into Upper Michigan; Jack-pine Warbler	PIRO
	no abstract available			
164	Thiel, R. P., Hammill, James H.	1988	Wolf specimen records in Upper Michigan, 1960-1986; Jack-pine Warbler	PIRO
	no abstract available			
165	Thiel, Richard P.	no date	Status of the timber wolf in Wisconsin: performance report	SACN
	Wolves were monitored from October 1987 to the summer of 1989 by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
166	Thurber, Joann M., Peterson, Rolf O.	1993	Effects of population density and pack size on the foraging ecology of gray wolves; Journal of Mammology	ISRO
	A decline in the gray wolf population in Isle Royale National Park prompted an intensive study of radiocollared individuals in 1988-1991, complementing an ongoing study begun in 1958. During winter, 1959-1991, the proportion of lone wolves was higher when the population was at low levels, whereas average size of packs declined with density of wolves. Sizes of territories (1971-1991) were not related to size of packs. In winter, food availability (kg wolf-1 day-1) and kill interval (days/kill) varied inversely with size of packs. Social relationships of radiocollared lone wolves were flexible; they often formed temporary groups of two or three wolves. Small groups(less than four) and lone wolves roamed large areas of the island (300 km2 and 540 km^2, respectively), frequently moving through territories of established packs. Solitary wolves and pairs readily killed adult moose, in contrast to a common belief that larger packs benefit from cooperative hunting.			

167	Thurber, Joann M., Peterson, Rolf O.	no date	Ecology of loners and small groups of gray wolves in Isle Royale National Park (A paper presented at the 52nd Midwest Fish and Wildlife Conference, December 2-5, 1990)	ISRO
	no abstract available			
168	Traves, Jody L.	1983	An assessment of quantity of prey consumed by wolves through analysis of scats	PIRO
	citation only			
169	U.S. Fish And Wildlife Service	1978	Eastern timber wolf recovery plan	ISRO
	no abstract available			
170	U.S. Fish And Wildlife Service	1989	Biological opinion - potential impacts of Voyageurs National Park trail plan on gray wolves	VOYA
	U.S. Fish and Wildlife Service's evaluation of the potential impacts of "winter" alternatives discussed in Voyageurs National Park's Trail Plan and associated Environmental Assessment. Discusses cross-country ski trails, snowmobile trails, restricted use areas, and their relation to gray wolf activities.			
171	U.S. Fish And Wildlife Service	1989	Diagnostic services case report - wolf necropsies	VOYA
	Collection of necropsy results from a number of gray wolf carcasses found on various dates and various locations within Voyageurs National Park. Includes information on serum test results, parasite infestations, tissue injuries, and probable causes of death.			
172	U.S. Fish And Wildlife Service	1992	US Fish and Wildlife Service biological opinion for the Voyageurs National Park 1992 Wilderness Recommendation	VOYA
	Report expresses U.S.F.W.S. opinions regarding the treatment of endangered and threatened species in the six alternatives for wilderness recommendation. Species of particular concern are the bald eagle and gray wolf.			
173	U.S. Fish And Wildlife Service	1992	Recovery plan for the eastern timber wolf	PIRO VOYA
	"The eastern timber wolf is a subspecies of the gray wolf and is listed as threatened in Minnesota and endangered throughout the remainder of its historic range in the eastern United States. A stable and growing population estimated at 1550 to 1750 wolves currently exists in Minnesota." (from Author's Summary) This plan discusses wolf biology, present population levels, critical habitat features, recovery objectives and methods of attaining the recovery goals. Voyageurs staff is working closely with this program.			
174	U.S.Geological Survey	1979	Voyageurs National Park - wolf howling site map	VOYA
	U.S.G.S. produced topographic map of Voyageurs National Park with wolf howling sites (surveys) depicted and numbered (hand-written)			
175	Van Ballenberghe, Victor, Mech, L. David	1975	Weights, growth, and survival of timber wolf pups in Minnesota; Journal of Mammalogy	VOYA
	"Weights, growth rates, canine tooth lengths, and survival data were obtained from 73 wild wolf (*Canis lupus*) pups that were 8 to 28 weeks old when live -trapped in three areas of northern Minnesota from 1969 to 1972. Relative weights of wild pups are expressed as percentages of a standard weight curve based on data from captive pups of similar age. These relative weights varied greatly within litters, between litters, and between years; extremes of 31 to 144 percent of the standard were observed." (Excerpts from authors' abstract)			
176	various authors	1951	Isle Royale as sanctuary for wolves	ISRO
	This volume is a photocopy of an NPS file containing correspondence on the idea of Isle Royale as a sanctuary for wolves and the introduction of the wolf to Isle Royale to control the growing moose population.			
177	Voyageurs National Park	1988	Winter range and food habits of wolves of Voyageurs National Park	VOYA
	Brief description of project entailing aerial and ground tracking of wolves to determine home range and food habits, in Voyageurs National Park from January 1, to April 15, 1988. Also see NRBIB record # 473 for report which appears to be associated with this project.			

178	Voyageurs National Park	1989	Radio-collared wolves only	VOYA
	Data sheet depicting the status of radio collared wolves in the park and out of the park in adjacent lands. Status broken down into the following categories: transmitting, dispersed/missing, illegally shot, illegally trapped, starved, killed by wolves, handling related, or collar dropped.			
179	Voyageurs National Park	1990	Aerial wolf surveys, 1990, Voyageurs National Park	VOYA
	Collection of xeroxed copies of aerial wolf survey forms. Surveys provide information on the location and activities of specific wolves (radio collared) in Voyageurs National Park.			
180	Voyageurs National Park	1991	Wildlife territories map, Voyageurs National Park	VOYA
	This is a park map with bald eagle territories and approximate ranges of wolf packs utilizing VNP in winter of 1990-91 delineated.			
181	Voyageurs National Park	1992	Restricted use area monitoring and enforcement - a report to the US Fish and Wildlife Service	VOYA
	After detailed evaluation in 1992, 127,436 acres of land and waters in Voyageurs National Park were proposed for wilderness designation with an additional 2,442 acres of potential wilderness additions. Through informal consultation with the U.S. Fish and Wildlife Service, the National Park Service determined that the proposed wilderness recommendation could adversely affect the two federally listed threatened species, the gray wolf and the bald eagle. Restricted use areas to protect critical habitat areas for these species were designated and monitored for encroachments. This report provides details on the documented encroachments and monitoring efforts for 1992-1993 winter season.			
182	Voyageurs National Park	1992	Restricted use areas - raw data and interim reports	VOYA
	Collection of hundreds of pages of raw data, tables and graphs, and interim reports on the Restricted Use Areas designated to protect wolf and bald eagle habitat in Voyageurs National Park. Data contains details of ground and aerial surveys which documented numbers of human encroachments and numbers of wildlife (including tracks) seen within the restricted use areas. This RUA file section also contains related official correspondences, news releases, and newspaper articles.			
183	Voyageurs National Park	1993	Restricted use area monitoring - enforcement actions, CY '93	VOYA
	Collection of copies of "Courtesy Tags" and violation notices issued for trespass into restricted use areas.			
184	Voyageurs National Park	1993	Restricted use area monitoring - case incident summary, CY '93	VOYA
	Restricted Use Area Encroachment Records for the Winter of 1992-93. These are "GRASS" generated data sheets summarizing winter data from case incident reports.			
185	Voyageurs National Park	1993	Restricted use area surveys- summary reports	VOYA
	Collection of data sheets showing all the information collected on Restricted Use Areas in table form. Reports are generated from a Microsoft Access database and contain all the information collected from aerial and ground surveys, as well as information on encroachments and wildlife counts.			
186	Voyageurs National Park	1993	Case incident reports - wolf sightings and deer kill sightings	VOYA
	Collection of case incident reports providing details of either actual wolf sightings or findings of wolf-killed deer carcasses. Includes description of site located.			
187	Voyageurs National Park	1996	VOYA restricted winter use issue fact sheet	VOYA
	In house fact sheet detailing information regarding the proposed closures of some areas to snowmobiling due to concern over possible cumulative effects on the wolf populations within Voyageurs National Park.			
188	Voyageurs National Park	1996	Restricted winter use report, Voyageurs National Park, October 1996	VOYA
	Recreational snowmobiling has been a traditional use in the area now known as Voyageurs National Park for decades. Recently, small portions of the park were closed to snowmobiling to protect critical wolf and bald eagle habitat. This closure created great controversy in the local community, and eventual court hearings. "This report provides the following information on issues related to wolves in the park: 1) a summary of the history and implementation of the park's restricted use areas, 2) a review of the park's restricted use area aerial monitoring data, 3) results from data analysis of data collected in the park, and 4) recommendations to Voyageurs National Park Management for action implementation in the park." (Quotes from attached memorandum authored by park superintendent Barb West)			

189	Voyageurs National Park	no date	Gray wolf management, Voyageurs National Park (DRAFT)	VOYA
	This appears to be a draft copy of a newly revised edition of the Gray Wolf Action Plan, with handwritten notes in the margins. Finalized copy has not been located yet.			
190	Voyageurs National Park	no date	Determination of necessity for action under 36 CFR 15 and 17	VOYA
	In house report summarizing the issues involved with closure areas for wolf habitat, and provides the reasoning and legislative support behind the park's decision to implement these closure areas.			
191	Voyageurs National Park	no date	Howling sites and locations of responding wolves, Namakan District, 1988-1991	VOYA
	General land mass outlines of Voyageurs National Park with wolf howling sites and responding wolves locations depicted by symbol. Symbols indicate if responding wolves were a pack with pups, pack without pups, or a single wolf. Includes data for 1988 through 1991.			
192	Voyageurs National Park	no date	Prey animals found (kill sites), Voyageurs National Park, 1978	VOYA
	Xeroxed copies of data sheets containing detailed information on kill sites (wolf) found in the park in 1978. Contains information on the pack sightings, locations, and type of prey species found. Also gives details describing the condition of the remains.			
193	Voyageurs National Park	no date	Wolf howling surveys, 1988 to present	VOYA
	Collection of actual data sheets from the wolf howling surveys conducted in Voyageurs National Park from 1988 to 1996.			
194	Voyageurs National Park	no date	Wolf cumulative effects model, Voyageurs National Park	VOYA
	Collection of memos, meeting minutes, and research notes related to the Cumulative Effects Model (CEM) for wolves in Voyageurs National Park. The wolf CEM is an ongoing project.			
195	Voyageurs National Park	no date	Restricted use area (RUA) wolf densities	VOYA
	Outline of park (including shorelines and islands) with Restricted Use Areas and their related wolf densities depicted utilizing a shading gradient.			
196	Voyageurs National Park	no date	Cooperative agreement for maintaining a viable wolf population in Voyageurs National Park	VOYA
	Cooperative agreement between the Minnesota and Ontario Departments of Natural Resources, the US Fish and Wildlife Service, and the National Park Service to maintain wolves within Voyageurs National Park. Document states what each agency agrees to do in regards to the wolf program.			
197	Vucetich, John A., Peterson, Rolf O.	1995	Population viability analysis of Isle Royale wolves incorporating species interactions and social structure; abstract in Wolves and humans 2000: a global perspective for managing conflict, International Symposium Program and Abstracts, Duluth, MN	ISRO
	The authors constructed a two-species population model based on empirical data collected for wolves and moose on Isle Royale National Park. The model was designed to examine, for wolves, the relationship between initial population size and predicted mean time to extinction of wolves. This model represents the first effort to apply species interactions and social structure in a population viability analysis for a carnivore.			
198	Vucetich, J. A., Peterson, Rolf O., Sadhasivan, G.	no date	Cranial morphology dynamics in a founder population of North American wolves. IN: Peterson, R.O. 1994. Study of wolf decline, Chapter 10	ISRO
	In this morphometric study, skulls of 34 adult gray wolves from Isle Royale and southern Ontario were characterized. The Isle Royale wolf population was founded from the Ontario population in the late 1940s, has remained reproductively isolated ever since, and is known to have lost genetic diversity. Using multivariate morphological data, we tested the following hypotheses regarding the evolutionary dynamics of founder effects in wild populations: 1) Mean size of Isle Royale wolves will be larger than ONT wolves because of larger prey size; 2) the Isle Royale wolf population will possess less morphological variance in accordance since genetic disparity is related to phenotypic disparity; 3) Isle Royale population, suffering from loss of genetic diversity, will possess greater fluctuating asymmetry (FA) due to loss of developmental stability. Isle Royale wolves possessed much greater morphological variance in some traits, but generally contrary to conventional understanding of population genetics. Isle Royale wolves did not exhibit greater FA, and we question the use of FA as an index of developmental instability from loss of genetic variability.			

199	Vucetich, John A., Peterson, Rolf O., Waite, Thomas A.	1997	Effects of social structure and prey dynamics on extinction risk in gray wolves; Conservation Biology	ISRO
	Extinction models based on diffusion theory generally fail to incorporate two important aspects of population biology - social structure and prey dynamics. In this article, these aspects are included in an individual-based extinction model for small, isolated populations of the gray wolf (*Canis lupus*). This model predicts mean times to extinction significantly longer than those predicted by more general (diffusion) models. The article analyzes the extinction model for Isle Royale's wolf population. This work highlights the importance of considering social structure and resource dynamics in the development of population viability analyses.			
200	Waite, Carol A.	1994	Age determination of gray wolves from Isle Royale National Park	ISRO
	In this study, a combination of techniques were used to estimate the age of gray wolves from Ontario and Isle Royale. Tooth-wear and fusion status of cranial sutures wee used to initially rank individuals from youngest to oldest. Measurement data obtained from known-age captive and wild wolves was used to develop a regression equation to predict age based on the degree of canine pulp cavity closure. For final age determination, emphasis was placed on the number of opaque cementum increment visually determined from unstained tooth thin sections under transmitted polarized light. The formation of the first opaque cementum increment in gray wolves was confirmed to occur at 20 to 22 months of age. It was determined that the age of animals less than 9 years could be predicted to within 1.5 years using the regression equation developed during this study Maximum longevity of the island wolves based on cementum increment analysis was determined to be 11.2 years.			
201	Walsh, Ami Elizabeth	1994	The wolfman and the wolves	ISRO
	A story written about Rolf Peterson and his role in the moose-wolf research program carried out on Isle Royale since the late 1950s.			
202	Wayne, R. K., Lehman, N., Girman, D., Gogan, Peter J. P., Gilbert, D. A., Hansen, K., Peterson, Rolf O., Seal, Ulysses S., Eisenhawer, A., Mech, L. David, Krumenaker, Robert J.	1991	Conservation genetics of the endangered Isle Royale gray wolf; Conservation Biology	ISRO
	The small group of wolves on Isle Royale has been studied for over three decades as a model of the relationship between large carnivores and their prey. During the last ten years the population declined from 50 individuals to as few as 12 individuals. The causes of this decline may be food shortages, disease, or reduced genetic variability. We address the issues of genetic variability and relationships of ISRO wolves using allozyme electrophoresis, mtDNA restriction-site analysis, and multilocus hypervariable minisatellite DNA analysis (genetic fingerprinting). Our results indicate that approximately 50% of the allozyme heterozygosity has been lost in the island population, a decline similar to that expected if no immigration had occurred from the mainland. The genetic fingerprinting data indicate that the seven sampled Isle Royale wolves are as similar as captive populations of siblings. Surprisingly, the ISRO wolves have an mtDNA genotype that is very rare on the mainland, being found in only one of 144 mainland wolves. This suggests that the remaining Isle Royale wolves are probably derived from a single female founder.			
203	Wayne, R., Lehman, N., Allard, M., Honeycutt, R.	1992	Mitochondrial DNA variability of the gray wolf: genetic consequences of population decline and habitat fragmentation; Conservation Biology	ISRO
	no abstract available			
204	Weise, Thomas F.	1974	An experimental translocation of the eastern timber wolf	PIRO
	no abstract available			
205	Weise, Thomas F., Robinson, William L., Hook, Richard Ames, Mech, L. D.	1975	An experimental translocation of the eastern timber wolf	PIRO
	no abstract available			

206	Wolfe, Michael L., Allen, Durward L.	1973	Continued studies of the status, socialization, and relationships of Isle Royale wolves, 1967 to 1970; Journal of Mammalogy	ISRO
	Studies of the wolf (*Canis lupus*) and its prey in Isle Royale National Park commenced in 1958. Numbers, pack structures, and observed relationships are reported herein for winter periods of the 4 years, 1967 to 1970. An important feature of the period was the immigration of a pack of seven wolves in 1967. Four of the seven were black and thus identifiable. This addition raised wolf numbers on Isle Royale to at least 28. The population was reduced to 15 in 1968 through mortality and the possible egress of a pack of six to Canada; and estimates for the winters of 1969 and 1970 were 17 and 18, respectively. In the period 1967 to 1970 the common size for major packs on the island was six or seven, and evidence is accumulating that the area may not accommodate more than a single breeding group. The smaller packs did not evidence any decrease in predation efficiency relative to that observed for a large pack of 16 prior to 1967. Territorial antagonism, however, between the largest pack and a group of four apparently resulted in a clash in 1969 during which one of the four was killed. In the winter of 1970 the dominant pack contained eight wolves at the highest count.			
207	Wolowiec, Mark E.	1981	Helminth eggs in wolf and fox scats, in soil, and on vegetation from Isle Royale National Park, with special reference to Echinococcus granulosus	PIRO
	no abstract available			
208	Wydeven, Adrian	1990	Status of the timber wolf in Wisconsin: Performance report: July 1, 1989 to June 30, 1990	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The performance report discusses the results of monitoring and their implications for future wolf management.			
209	Wydeven, Adrian	1991	no title	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. Howling and track surveys were conducted as well. The letter discusses the results of monitoring and their implications for future wolf management.			
210	Wydeven, Adrian P.	1992	no title	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. Howling surveys were also conducted. The letter discusses the results of monitoring and their implications for future wolf management.			
211	Wydeven, Adrian P.	1993	Progress report of wolf population monitor in Wisconsin for the period January - March 1993	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
212	Wydeven, Adrian P.	1993	Progress report of wolf population monitoring in Wisconsin for the period April - June 1993	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications in future wolf management.			
213	Wydeven, Adrian P.	1993	Progress report of wolf population monitoring in Wisconsin for the period July - September 1993	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. Howling surveys were also conducted. The report discusses the results of monitoring and their implications for future wolf management.			
214	Wydeven, Adrian P.	1993	no title	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. Track surveys were also conducted. The letter discusses the results of monitoring and their implications for future wolf management.			

215	Wydeven, Adrian P.	1994	Progress report of wolf population monitoring in Wisconsin for the period October - December 1993	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
216	Wydevan, Adrian P.	1994	Status of the timber wolf in Wisconsin; Wisconsin endangered resources report	SACN
	Radio-collared wolves were monitored throughout the state of Wisconsin, and blood samples were tested for canine diseases. The report discusses the findings of monitoring and testing and their possible implications for future wolf management in Wisconsin.			
217	Wydeven, Adrian P.	1994	Progress report of wolf population monitoring in Wisconsin for the period January - March 1994	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications to future wolf management.			
218	Wydeven, Adrain	1994	Progress report of wolf population monitoring in Wisconsin for the period April - June 1994	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
219	Wydeven, Adrian P.	1995	Progress report of wolf population monitoring in Wisconsin for the period January - March 1995	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
220	Wydeven, Adrian P.	1995	Progress report of wolf population monitoring in Wisconsin for the period April - June 1995	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
221	Wydeven, Adrian P.	1995	Progress report of wolf population monitoring in Wisconsin for the period October - December 1994	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
222	Wydeven, Adrian P.	1996	Progress report of wolf population monitoring in Wisconsin for the period July - September 1996	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. Howling surveys were also conducted and wolf observations were reported. The report discusses the results of monitoring and their implications for future management.			
223	Wydeven, Adrian P., Boles, Sarah R.	1998	Progress report of wolf population monitoring in Wisconsin for the period October 1997 - March 1998	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of the monitoring and their implications for future wolf management.			
224	Wydeven, Adrian P., Boles, Sarah R.	1998	Progress report of wolf population monitoring in Wisconsin for the period October-December 1997	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			

225	Wydeven, Adrian P., Cervantes, Nancy M.	1997	Progress report of wolf population monitoring in Wisconsin for the period January - March 1997	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
226	Wydeven, Adrian P., Cervantes, Nancy M.	1997	Progress report of wolf population monitoring in Wisconsin for the period April-September 1997	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program that began in 1979. Radio telemetry was used to determine the locations of wolves and territories. Howling surveys were also conducted and wolf observations were reported. The report discusses the results of monitoring and their implications to future wolf management.			
227	Wydeven, Adrian P., Cervantes, Nancy M.	1997	Progress report of wolf population monitoring in Wisconsin for the period October - December 1996	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
228	Wydeven, Adrian P., Conner, Ronda	1998	Progress report of wolf population monitoring in Wisconsin for the period April-June 1998	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
229	Wydeven, Adrian P., Kohn, Bruce E., Thiel, Richard P., Schultz, Ronald N., Boles, Sarah R.	1998	Progress report of wolf population monitoring in Wisconsin for the period April - September 1998	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program that began in 1979. Radio telemetry was used to determine the location of wolves and territories. Howling surveys were also conducted, and wolf observations were reported. The report discusses the results of monitoring and their implications for future wolf management.			
230	Wydeven, Adrian P., Megown, Rebecca A.	1996	Progress report of wolf population monitoring in Wisconsin for the period January - March 1996	SACN
	Gray wolves were monitored using radio telemetry throughout the state of Wisconsin from January to March of 1996. Tracking surveys were conducted by volunteers, as well. The report discusses the results of monitoring and their implications for future wolf management in Wisconsin.			
231	Wydeven, Adrian P., Megown, Rebecca A.	1996	Progress report of wolf population monitoring in Wisconsin for the period April - June 1996	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine locations of wolves and territories. The report discusses the results of monitoring and their implications on future wolf management.			
232	Wydeven, Adrian P., Megown, Rebecca A.	1996	Progress report of wolf population monitoring in Wisconsin for the period	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to determine the locations of wolves and territories. The report discusses the results of monitoring and their implications for future wolf management.			
233	Wydeven, Adrian P., Megown, Rebecca A.	no date	Progress reports of wolf population monitoring in Wisconsin, 1994-1996	VOYA
	Collection of progress reports from the Wisconsin Department of Natural Resources concerning their efforts to monitor wolf populations in order to assess recovery levels.			

234	Wydeven, Adrian P., Wiedenhoeft, Jane E.	1999	Progress report of wolf population monitoring in Wisconsin for the period April-June 1999	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and determine territories. The report discusses the results of monitoring and their implications for future wolf management.			
235	Wydeven, Adrian P., Wiedenhoeft, Jane E.	2002	Progress report of wolf population monitoring in Wisconsin for the period October - December 2001	SACN
	Forty-two wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate the wolves and territories were determined. The report discusses the results of the program and the implications they have for future wolf management.			
236	Wydeven, Adrian, Wiedenhoeft, Jane, Boles, Sarah, Schultz, Ronald, Kohn, Bruce, Thiel, Richard	2000	Progress report of wolf population monitoring in Wisconsin for the period October 1999 - March 2000	APIS
	The monitoring of gray wolf populations in Wisconsin has been ongoing since Fall 1979. Gray wolves are listed as a state threatened species (1999) and federally endangered species (1967, 1974) in Wisconsin. The 1999 Wisconsin wolf management plan reinforced the need to continue intense monitoring of the state wolf population well into the future. Wisconsin wolves have been at the reclassification goal of 80+ for six years and are approaching the state delisting goal (250 wolves outside of Indian reservations). A minimum count of 248-249 wolves were counted outside of Indian Reservations. The mean "winter" territory size of 17 adults was 39 square miles, the smallest mean territory recorded, probably due to very high deer populations throughout the state. Total area occupied by territorial wolves was about 3600 square miles at a density of 1wolf/15 square miles. An estimated 72 to 98 pups survived to late winter for an average survival rate of 31%.			
237	Wydeven, Adrian P., Wiedenhoeft, Jane E., Kohn, Bruce E., Thiel, Richard P., Schultz, Ronald N., Boles, Sarah R.	1999	Progress report of wolf population monitoring in Wisconsin for the period April - September 1999	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and determine territories. Howling surveys were also conducted and observations were reported. The report discusses the results of monitoring and their implications for future wolf management.			
238	Wydeven, Adrian P., Wiedenhoeft, Jane E., Kohn, Bruce E., Thiel, Richard P., Schultz, Ronald N., Boles, Sarah R.	1999	Progress report of wolf population monitoring in Wisconsin for the period October 1998 - March 1999	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves and determine territories. The report discusses the results of the monitoring and their implications for future wolf management.			
239	Wydeven, Adrian P., Wiedenhoeft, Jane E., Schultz, Ronald L., Thiel, Richard P., Boles, Sarah R., Hall, Wayne H., Jr., Heilhecker, Ellen	2003	Progress report of wolf population monitoring in Wisconsin for the period October 2002 - March 2003	SACN
	The Wisconsin Department of Natural Resources monitored Wisconsin wolf populations using radio telemetry. Wolf locations were obtained approximately once a week and territories were mapped. The report discusses the results of the monitoring and their significance for future wolf management.			

240	Wydeven, Adrian P., Wiedenhoeft, Jane E., Schultz, Ronald N., Thiel, Richard P., Boles, Sarah R., Kohn, Bruce E.	2002	Progress report of wolf population monitoring in Wisconsin for the period October 2001 - March 2002	SACN
	Gray wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry surveys were conducted to determine the location of wolves, and territory maps were produced. The report discusses the results of the monitoring effort and their implications to future wolf management in Wisconsin.			
241	Wydeven, Adrian P., Wiedenhoeft, Jane E., Schultz, Ronald N., Thiel, Richard P., Hall, Wayne H. Jr.	2003	Progress report of wolf monitoring in Wisconsin for the period April - September 2002	SACN
	The Wisconsin Department of Natural Resource captured 46 (2 recaptures) wolves during the spring and summer of 2002. Radio transmitters were placed on 44 of them. All radio collared wolves were monitored throughout the state of Wisconsin, and howl surveys were conducted. Wolf observations were also reported. The report outlines the monitoring data collected from April to September of 2002 and discusses the significance they have on wolf management in Wisconsin.			
242	Wydeven, Adrian P., Wiedenhoeft, Jane E., Schultz, Ronald N., Thiel, Richard P., Hall, Wayne H. Jr., Kohn, Bruce K.	2001	Progress report of wolf population monitoring in Wisconsin for the period April - September 2001	SACN
	As part of the project started in 1979, wolves were monitored by the Wisconsin Department of Natural Resources using radio telemetry. Thirty-five wolves were captured, and collars were placed on 24 of them. Howl surveys were also conducted and observations were reported. The report outlines the data collected and discusses its implications to future wolf management.			
243	Wydeven, Adrian P., Wiedenhoeft, Jane E., Schultz, Ronald N., Thiel, Richard P., Kohn, Bruce K., Keenlance, Paul W., Hall, Wayne H., Jr.	2000	Progress report of wolf population monitoring in Wisconsin for the period April - September 2000	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate the wolves and determine territories. Howl surveys were also conducted, and observations were reported. The report discusses the results of monitoring and its implications for future wolf management.			
244	Wydeven, Adrian P., Wiedenhoeft, Jane E., Thiel, Richard P., Schultz, Ronald N., Kohn, Bruce E., Boles, Sarah R.	2001	Progress report of wolf population monitoring in Wisconsin for the period October 2000 - March 2001	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate wolves in northern Wisconsin. The report discusses the results of monitoring and their implications for future wolf management.			
245	Wydeven, Adrien P., Wiedenhoeft, Jane E.	2000	Progress report of wolf monitoring in Wisconsin: October - December 1999	SACN
	Wolves were monitored by the Wisconsin Department of Natural Resources as part of a monitoring program begun in 1979. Radio telemetry was used to locate the wolves and determine territories. The report discusses the results of the monitoring and their implications for future wolf management.			

MISCELLANEOUS				
1	Campbell, Mariel	1994	Center for Disease Control's (CDC) hantavirus survey	SACN
	In conjunction with a nation-wide hantavirus survey, the St. Croix Riverway was designated as a survey location. This report details the results of live trapping efforts of rodents associated with this disease. Species, numbers collected, legal description of trapping locations, and habitat are included. Final results will be provided by the CDC.			
2	Johnson, Jerry M.	1995	Preliminary results of seroprevalence study of rodent populations associated with hantavirus (synombre) disease	VOYA
	Results of serological tests done on rodent specimens collected at various national park units to check for the prevalence of hanta virus. Results from specimens taken at Voyageurs National Park are included.			
3	Earle, Richard D., Tuovila, Valerie R.	2003	Furbearer winter track count survey of 2002	PIRO
	A furbearer winter track count survey was conducted in 2002 to determine the distribution and relative abundance of marten (*Martes americana*) in the Upper Peninsula of Michigan. Several additional furbearers and selected prey species also were monitored. The survey included 93 track routes that were 8 km in length. Eighty-one marten were counted from 110 marten track crossings. Coyote (*Canis latrans*) left tracks along 74% of the routes and were the most widely distributed furbearers. Lynx (*Lynx canadensis*) and cougar (*Felis concolor*) were not detected. Tables include active routes for each species, and relative abundance and significance testing of 2001 and 2002 track crossings. A map illustrates marten activity along survey routes.			
4	Roop, L.J.	1962	A study of trapping methods and ecology of the snowshoe hare on Isle Royale, 1962	ISRO
	no abstract available			

SOILS

1	Ableiter, Kenneth J.	1961	Soil survey, Bayfield County, Wisconsin	APIS
	This report is a soil survey of Bayfield County, WI. Approximately one third of the county is occupied by red clay soils; one third by sands and loamy sands; and one third by generally stony sandy loams, loams, and silt loams.			
2	Banerjee, S.K, King, J., Marvin, J.	1981	A rapid method for magnetic granulometry with applications to environmental studies; Geophysical Research Letters	SACN
	no abstract available			
3	Barrett, L.R, Schaetzl, R.J.	1992	An examination of podzolization near Lake Michigan using chronofunctions; Canadian Journal of Soil Science	SLBE
	no abstract available			
4	Booy, E.	1976	Engineering problems in Ontonagon clay; Geol Soc Am, Abstr Programs	SACN
	no abstract available			
5	Chamberlain, L. M.	1977	Soil survey of Anoka County, Minnesota	SACN
	no abstract available			
6	Dominski, Anthony S.	No Date	The soils of Isle Royale	ISRO
	no abstract available			
7	Farmer, E.E, Fletcher, J.E.	1977	Highway erosion control systems; an evaluation based on the universal soil loss equation	SACN
	no abstract available			
8	Grimes, D.J, Siems, D.F., Alminas, H.V.	1981	Analyses of A-horizon soil and outcrop samples from the Vermilion district, northeastern Minnesota; US Geological Survey Open file report	VOYA
	no abstract available			
9	Hanson, David G. Jr.	1986	The effects of acidic deposition on forest soils of Isle Royale National Park and the Keweenaw Peninsula of Michigan	ISRO
	Examines the effect of acidic deposition on forest soils at Isle Royale and on the Keweenaw Peninsula to determine if this deposition leaches base cations from the forest soil. Four forest types included in the study were a pure spruce, a birch-aspen, and a maple stand on Isle Royale, and a mixed hardwood-conifer stand on the Keweenaw Peninsula. Throughfall, litter leachate, and soil solution from four soil horizons were examined for specific cations and anions. Selected water samples were also analyzed for aluminum and silicate. Soils were examined for basic soil properties such as exchangeable base cations, pH, texture and sesquioxide content, which may affect sensitivity to acidic deposition.			
10	Iverson, L.R., Hutchinson, T.F.	2002	Soil temperature and soil moisture fluctuations during and after prescribed fire in mixed-oak forests, USA; Natural Areas Journal	INDU, LIBO, SLBE
	Prescribed fire is a commonly used management tool in eastern United States forests, but few studies have documented the effects of prescribed fire on soil temperature and moisture. Prescribed fires were conducted in March 1999, in mixed-oak forests in Vinton County, Ohio, USA, that had been burned either once in 1996 (infrequent burn treatment) or annually from 1996 to 1999 (frequent burn treatment). During the fires, seven electronic sensors recorded soil temperatures every 2 seconds at a depth of 1 cm. Following the fires, soil temperatures were monitored with 12 sensors on burned and unburned areas from April to October. Also at the sensor locations, soil moisture was determined gravimetrically six times during the growing season. While the immediate, direct effects of fire on soil temperature and moisture probably were ecologically insignificant, the indirect biological effects that persisted throughout the growing season, particularly on xeric sites, are likely to be important to below ground processes.			

11	Johnston, C.A., Pinay, G., Arens, C., Naiman, R.J.	1995	Influence of soil properties on the biogeochemistry of a beaver meadow hydrosequence; Soil Science Society of America Journal	VOYA
	Previous research about the biogeochemistry of beaver (*Castor canadensis* Kuhl) impoundments has generally overlooked the influence of soil types on solutes. In this study, soils derived from glacio-lacustrine and glacio-fluvial parent materials in northern Minnesota beaver meadows (i.e., former beaver ponds that have drained and revegetated) were studied to: (1) describe soil morphology, (2) analyze soil and solute chemistry, and (3) statistically evaluate the relative influence of hydrology and soil type on solute chemistry.			
12	Kepner, R., Stottlemyer, R.	1988	Organic and inorganic sulfur in soils of a boreal forest; abstract - Lake Superior Biological Conference, Northern Michigan University, Marquette, MI	ISRO
	no abstract available			
13	Kurz, Herman	1923	Hydrogen ion concentration in relation to ecological factors; Botanical Gazette	INDU
	This paper presents results of studies indicating the general influences of topography, soil types, soil depths, and seasonal phenomena on the hydrogen ion concentration, and how plant distribution is affected. There are two sections pertaining to the Indiana Dunes National Lakeshore at the Long Lake and Mineral Springs Dune regions. Species present at these sites are listed, with graphs of plant associations.			
14	Langton, J.E.	1978	Soil survey of St Croix County, Wisconsin	SACN
	no abstract available			
15	Lewis, Royce R.	1973	Soil survey of selected areas in Voyageurs National Park	VOYA
	Contains a collection of soil survey forms, aerial photos with area identification numbers and a key to the survey methods. Appears to cover areas now in Voyageurs National Park although some survey forms are "pre-Park" dated.			
16	Loope, Walter L., Arbogast, Alan F.	2000	Dominance of an ~150-year cycle of sand-supply change in late holocene dune-building along the eastern shore of Lake Michigan; Quaternary Research	SLBE
	Buried soils within active perched dunefields along the eastern shore of Lake Michigan were classified and examined for organic matter (charcoal and wood) that yielded carbon-14 dates. The authors suggest that periodic sand movement has occurred as rising lake levels destabilize the bluff faces of dunes, and windborne sand buries forest on top of the bluff. The authors state that when lake level falls, the sand supply ceases and reforestation begins. Artwork depicts the process of dune building and reforestation as lake levels change. Evidence for the timing and extent of changes in Lake Michigan lake level from this study is compared to the work of other researchers. Evidence for this activity of dune building on approximately an 150 year cycle is limited to the last 1500 years, contrary to previous literature that suggest the origin of the dunes dates to the Nipissing high water state (5500 to 5000 years before present). Map illustrates location of study sites all along the eastern shore of Lake Michigan.			
17	McHugh, J.B, Hopkins, R.T., Alminas, H.V., Hill, G.T.	1992	Gold and spectrographic analyses of 110 outcrop and 238 B-horizon soil samples from the western Vermilion District, northeastern Minnesota; US Geological Survey Open file report	SACN VOYA
	no abstract available			
18	Meineke, D.G, Vadis, M.K., Klaysmat, A.W.	1977	Pilot study on soil exploration geochemistry, Birch Lake area, Lake County, Minnesota; Report Minnesota Department of Natural Resources, Division of Minerals	APIS
	no abstract available			
19	Mengel, J.T.	1976	Red clay characteristics in relation to slope stability in the Little Balsam drainage	SACN
	no abstract available			
20	Meyers, D, Chang, L.L.Y.	1977	Mineralogy of the red clay and its relation to slope stability in Douglas County, Wisconsin; Geol Soc Am, Abstr Programs	SACN
	no abstract available			

21	Morgan, William Tony	1983	Sedimentological, hydrological, and engineering controls on slope form, Indiana Dunes National Lakeshore	INDU
	no abstract available			
22	Pastor, John, Post, W.M.	1985	Development of a linked forest productivity-soil process model	ISRO
	no abstract available			
23	Pastor, John, Post, W.M.	1986	Influence of climate, soil moisture, and succession on forest carbon and nitrogen cycles; Biogeochemistry	ISRO
	no abstract available			
24	Reshkin, Mark	1975	Appendices of 1975 soil survey maps of the lakeshore region, Porter and LaPorte Counties, Indiana; basic ecosystem studies of the Indiana Dunes National Lakeshore	INDU
	Appendix 4-1 includes a soil survey legend, conventional symbols, soil survey map sheets, and location quadrangle maps for areas in and near the Indiana Dunes National Lakeshore. Appendix 4-2 contains results of analyses and tests made on Auger-Hole samples from Lake and Porter Counties, Indiana. Appendix 4-3 describes degree of limitations and soil features affecting use for septic tank absorption fields, dwellings and buildings for light commercial use. Appendix 4-4 shows lakeshore region soil interpretation sheets, including pages on their interpretation.			
25	Shetron, Stephen G.	1972	Soils of spruce-fir forest type on Isle Royale, Michigan	ISRO
	Fifteen study plots were established in the spruce-fir forest type on Isle Royale and the soils described thereon for the spruce-fir study under the direction of Dr. Robert Janke.			
26	Shetron, Stephen G.	1973	Soils of spruce-fir forest type on Isle Royale, Michigan (1973 supplement to report dated 12/29/72)	ISRO
	This supplemental report contains soil descriptions for four study plots visited in July 1973.			
27	Shetron, Stephen G., Anderson, Gregg, Sprecher, S.G., Stottlemyer, Robert	1988	Isle Royale National Park soil inventory GLARSU technical report #30, progress report submitted to Dr Michiael Ruggiero, Chief Scientist, Midwest Region, National Park Service, Omaha, NE	ISRO
	no abstract available			
28	Shetron, Stephen G., Anderson, Gregg, Sprecher, Stephen G., Stottlemyer, Robert	1988	Progress report - 1987 Isle Royale National Park, soil inventory	ISRO
	The soil survey of Isle Royale National Park is a field based project to provide soil inventory maps, soil morphological and compositional data for classification of soils, and baseline data for an ongoing acid precipitation study. This report is a summary of accomplishments through December 1987.			
29	Shetron, Stephen G., Stottlemyer, Robert	1989	Isle Royale soil survey progress report for 1988	ISRO
	A progress report after the second year of field work in a three-year project to identify and map the soil types on Isle Royale National Park. Contains proposed Minong and Nipissing Soil descriptions for new soils found only on Isle Royale. Appendix C is a general soil map and legend for Isle Royale, based on 1987 and 1988 soil survey data.			
31	Stottlemyer, Robert, Hanson, David G. Jr.	1985	Comparison of sulfate mobility in soils of mature boreal and northern hardwood forested watersheds, Upper Great Lakes region; abstract - NADP Technical Committee Meeting, October 8-11, 1985, Colorado State University, Fort Collins, CO p 21	ISRO
	no abstract available			

30	Stottlemyer, Robert, Hanson, David G. Jr.	1987	Anthropic inputs and ionic concentrations in forest soils, Lake Superior basin GLARSU Technical Report #23 submitted to Dr M Ruggiero, Chief Scientist, National Park Service, Midwest Region, Omaha, NE	ISRO
	no abstract available			
32	Stottlemyer, Robert, Shetron, Stephen G.	1987	Soil taxonomy and chemical and physical characteristics; Isle Royale National Park, Michigan: 1987 Progress Report, GLARSU Tech Report #26	ISRO
	A progress report with results to date on this soil survey project. Two initial transects were made with some work conducted on soil-geomorphic relationships, along with some work in the Wallace Lake watershed.			
33	Stottlemyer, Robert, Toczydlowski, David	1995	Modification of snowmelt chemistry by forest floor and mineral soil, Northern Michigan (Research Report #60)	ISRO
	no abstract available			
34	Stottlemyer, Robert, Toczydlowski, David	1999	Seasonal change in precipitation, snowpack, snowmelt, soil water, and streamwater chemistry, northern Michigan; Hydrological Processes	ISRO
	Weekly precipitation, snowpack, snowmelt, soil water, and streamwater chemistry was studied throughout winter for over a decade in a small northern Michigan watershed (Calumet, MI). We examined physical, chemical, and biological processes responsible for observed seasonal change in streamwater chemistry. The objective was to define the contributions made to winter and spring streamwater chemical concentration and flux by processes as snowmelt, over-winter forest floor and surface soil mineralization, immobilization, and exchange, and subsurface flowpath. Small, but steady snowmelt throughout winter removed readily mobilized soil NO3 which lead to big over-winter streamwater concentrations but little flux. Winter soil water levels and flowpaths were generally deep which increased soil water and streamwater base cation, HCO3, and Si concentrations. Spring snowmelt increased soil water levels and removal of ions and DOC from the biologically active forest floor and shallow soils.			
35	Thomas, D.D.	No Date	Soil survey of Eau Claire County, Wisconsin	SACN
	no abstract available			
36	U.S.D.A. Soil Conservation Service	1973	Soil survey of Leelanau County, Michigan	SLBE
	Describes the soils found in Leelanau County, Michigan. Discusses use and management of soils, and the formation, morphology, and classification of soils. There are aerial photographs with designations showing the locations of the soils in Leelanau County.			
37	Wanek, Wallace J.	1971	A study of the impact of snowmobiling on northern Minnesota ecology - an interim report, July, 1971	VOYA
	This progress report describes in detail the work completed in the initial phases of a project designed to study the effects of snowmobiling on the environment in northern Minnesota. In particular, the study analyzes differences in soil temperatures and conifer seedling damage where snowmobile trails have compacted the snow. Also see NRBIB record numbers 1073 and 1074 for further progress reports.			
38	Wanek, Wallace J.	1972	A continuing study of the ecological impact of snowmobiling in northern Minnesota (final research report for 1971-1972)	VOYA
	This progress report describes in detail the work completed in phases of a project designed to study the effects of snowmobiling on the environment in northern Minnesota. In particular, the study analyzes differences in soil temperatures and conifer seedling damage where snowmobile trails have compacted the snow. Also see NRBIB record numbers 1072 and 1074 for further progress reports.			
39	Wanek, Wallace J.	1973	A continuing study of the ecological impact of snowmobiling in northern Minnesota (final research report for 1972-1973)	VOYA
	This progress report describes in detail the work completed in phases of a project designed to study the effects of snowmobiling on the environment in northern Minnesota. In particular, the study analyzes differences in soil temperatures and conifer seedling damage where snowmobile trails have compacted the snow. Also see NRBIB record numbers 1072 and 1073 for previous progress reports.			

40	Weber, Herman L., Hall, Robert, Benson, Nels R., Van Winter, G.	1966	Soil survey of Grand Traverse County, Michigan	SLBE
	Describes soils found in Grand Traverse County, Michigan. Discusses the formation and classification of soils, and the use, management, and productivity of soils. There are aerial photographs of Grand Traverse County with designations showing the locations of soils.			
41	West, C.C., Lyon, W.G., Ross, D.L., Pennington, L.K.	1994	Investigation of vertical distribution and morphology of indigenous organic matter at Sleeping Bear site, Michigan; Environmental Geology	SLBE
	Report of a study of naturally-occurring organic coasting on sand grains near site where underground fuel tanks had leaked and contaminated the soil (located on the border of Sleeping Bear Dunes National Lakeshore). The analysis included pH, total organic/inorganic carbon, humic acid and fulvic acid contents, carbonate minerals, and soil gases. Looked at the distribution of carbon relative to depth of soil. '...it is appropriate to reflect on the relevance of this information with respect to pollutant fate and transport.'			

VEGETATION

1	Adams, Charles C.	1909	Isle Royale as a biotic environment; an ecological survey of Isle Royale, Lake Superior	ISRO
	Identifies plant species and environments at various locations on Isle Royale to attempt to understand species genesis or succession. This chapter also presents information on the physical environment of the Island including the geology, topography, atmospheric influences, the surface currents of Lake Superior, and the origin of the habitats.			
2	Arduser, Mike	1981	Vascular plants of Pictured Rocks	PIRO
	This list of 35 vascular plant species includes locations where plants were observed/identified in Pictured Rocks National Lakeshore, Michigan. Locations include Beaver Basin, Miners Basin, Grand Sable Dunes area, Chapel Lake area, and Sand Point. The list includes only vascular plants that were not previously reported by Robert Read in his study, "Vascular plants of Pictured Rocks National Lakeshore, Alger County, Michigan".			
3	Austin, John	1990	PIRO vascular plants [DRAFT]; Beaver Basin Rim Road environmental impact statement	PIRO
	A draft version of the vegetation analysis portion of the Environmental Impact Statement for the Beaver Basin Rim Road in Pictured Rocks National Lakeshore is based on Robert Read's article Vascular Plants of Pictured Rocks National Lakeshore (May 1974) in the "Michigan Botanist". Walter Loope, ecologist at Pictured Rocks National Lakeshore made some changes to the document based on his experience. Plants are listed according to habitat. At the end of the work there is a checklist of the vascular plants of the Lakeshore, alphabetized by family name.			
4	author unknown	no date	Action plan for endangered and threatened plant species within Indiana Dunes National Lakeshore	INDU
	The plan proposes a method of management for endangered and threatened plant species at the Indiana Dunes National Lakeshore based upon management recommendations from previous research studies. It includes sections on vegetation history for the area, endangered and threatened plant management (including legal mandates, mitigation, collection policy, restoration of native species, and individual action plans), and a bibliography. Tables show criteria for natural areas assessment and a sampling model. Appendices include state listed plants occurring in the park, species of immediate concern, a flow diagram for plant management, and monitoring survey summary sheets.			
5	author unknown	1985	Exotic plants of Isle Royale National Park	ISRO
	The document is a list of eighty-eight exotic plants occurring at Isle Royale National Park.			
6	Bach, David P.	1978	Plant communities, habitats and soil conditions of Grand Sable Dunes, Pictured Rocks National Lakeshore, Michigan	PIRO
	The plant communities, habitats, and soil conditions of the Grand Sable Dunes within Pictured Rocks National Lakeshore, MI are identified and described. A review of the literature on the deglaciation of the upper Great Lakes region, dune migration, recent climate and weather records, vegetation history, and human influence is thorough. Vegetation plots were established in quadrats. In each quadrat, vegetation was identified and characterized into three strata: ground cover, shrubs, and trees. Data were tabulated by cover-abundance, indices of similarity, and sand movement habitats. Vegetation analysis by three-axis polar ordination delineated 5 plant communities: active dunelands (characterized by marram grass), gravel lags (characterized by dune willow), stabilizing dunelands (characterized by little bluestem), pioneer woodlands (dominated in most quadrats by jack pine), and second growth forest (characterized by beech), and sugar maple.			
7	Bacone, John A., Campbell, Ronald K., Wilhelm, Gerould S.	1980	Presettlement vegetation of the Indiana Dunes National Lakeshore; proceedings of the second conference on scientific research in the National Parks: Volume 4: Resource analysis and mapping	INDU
	The presettlement plant communities in the Indiana Dunes National Lakeshore area are presented in floristic and geographic terms as perceived by the researchers and extrapolated from the original land surveys. Vegetation inventories were used to determine location of communities at the date of the study. The natural integrity of those areas is addressed, along with their degree of change since presettlement times, and ecological concepts are recommended for proper management. Several maps and species lists accompany the text.			

8	Beal, W.J.	1904	A Few Words Concerning the New Michigan Flora, Sixth Report of the Michigan Academy of Science	ISRO
	no abstract available			
9	Beaman, J.H.	1977	Commentary on endangered and threatened plants in Michigan; The Michigan Botanist	ISRO
	no abstract available			
10	Bennett, James P.	1989	Biological effects of air pollution on terrestrial vegetation in National Park units in the Great Lakes basin	VOYA
	The Midwest Region of the National Park Service manages nine parks in the Great Lakes Basin. Almost 2,000 vascular plant species occur within these parks and about 90% of them occur in all nine. It is highly probable that about 10% of these 90 common species are air pollution sensitive. The region these parks represent is crossed by a number of air pollution gradients. This allows for a regional approach to studying air pollution. Thirteen tasks under projects objectives are outlined in this report.			
11	Bennett, J.P.	1995	Plant species in Voyageurs National Park, Minnesota	VOYA
	List of plant species identified by the author in Voyageurs National Park.			
12	Bowles, Marlin L.	1988	A report on special floristic elements at the Indiana Dunes National Lakeshore: New species monitoring and update of selected existing populations	INDU
	Forty-one permanent quadrats were remonitored for endangered and threatened plant species in the Indiana Dunes National Lakeshore in 1987. Specific plant management burning, vegetation control, habitat protection, and monitoring recommendations are provided.			
13	Bowles, Marlin	1990	Report on the status of endangered and threatened plants of the Indiana Dunes National Lakeshore	INDU
	Established plots were monitored for rare plant species at Indiana Dunes National Lakeshore in 1989.			
14	Bowles, Marlin	1991	Report on the status of endangered and threatened plants at the Indiana Dunes National Lakeshore	INDU
	The reports present results of endangered and threatened plant monitoring conducted at the Indiana Dunes National Lakeshore. Included are descriptions of the species monitored and recommendations for their management. Segments on beach and dune complex adapted vegetation, wetland fen and bog vegetation, and grassland vegetation are included, with individual summaries for each species studied. Maps and data sheets for the study are also included.			
15	Bowles, Marlin L., Demauro, Marcella M., Pavlovic, Noel, Hiebert, Ronald D.	1990	Effects of anthropogenic disturbances on endangered and threatened plants at the Indiana Dunes National Lakeshore; Natural Areas Journal	INDU
	Eighty-one plant species listed as endangered or threatened in the state of Indiana were studied to determine the impact human and anthropogenic disturbance regimes have had on vegetative communities at Indiana Dunes National Lakeshore. Positive and negative effects of each disturbance type on each community are discussed in detail.			
16	Bowles, Marlin, Hess, William J., Demauro, Marcella	1985	An assessment of the monitoring program for special floristic elements at Indiana Dunes National Lakeshore: Phase I: the endangered species	INDU
	The purpose of the study was to locate and map the locations of 54 vascular plant species listed as endangered by the State of Indiana. Permanent monitoring plots for species were located, and permanent monitoring schemes with ecological and management summaries were also set up for each taxa. Research and management suggestions are made for the future. The study area included Indiana Dunes National Lakeshore, Indiana Dunes State Park, and Hoosier Prairie.			
17	Bowles, Marlin, Hess, William J., Demauro, Marcella	1988	An assessment of the monitoring program for special floristic elements at Indiana Dunes National Lakeshore: Phase II: Threatened and special concern species	INDU
	The status of 50 State of Indiana threatened plant taxa and 27 special concern taxa were investigated within the Indiana Dunes National Lakeshore. The report includes methods for locating and mapping plant populations, establishing permanent photographic stations, and collecting quantitative data. Results and discussion, with a management summary, are included with supporting figures and tables. Four appendices include natural community classification, threatened taxa monitoring schedule, threatened plant descriptions and management summaries, and threatened taxa not relocated.			

18	Bowles, Marlin, Hess, William J., Demauro, Marcella M., Hiebert, Ronald D.	1986	Endangered plant inventory and monitoring strategies at Indiana Dunes National Lakeshore; Natural areas journal	INDU, OZAR
	Thirty-five endangered plant taxa were studied at the Indiana Dunes National Lakeshore. Their populations were delineated on park data base maps and quantified from permanent plots. Sampling methods were based on plant history, growth form, and distribution. A monitoring program was developed, based on population characteristics and on land use. Quantification of populations was most successful when they were small. Accurate quantification of more common taxa would require more intense data collection, which is controlled by time and budget limitation.			
19	Brown, Clair A.	1933	Ferns and flowering plants of Isle Royale Michigan	ISRO
	Botanical study made in 1930 by a party from the University of Michigan Herbarium of cryptogamic flora, ferns and flowering plants. Includes a brief description of the location, climate, history, vegetation and changes in the vegetation due to insects, mammal damage, fire, and natural changes. Has an annotated catalog of species (Pteridophytes and Spermatophytes) found with descriptions of locations. The archived copy of this booklet has markings which indicate plants that are part of the park's herbarium (this copy current through 1959).			
20	Brunton, D. F.	1991	Checklist of vascular plants, Lake Superior Provincial Park, 2nd Edition	ISRO
	no abstract available			
21	Butters, Fred K., Abbe, Ernst C.	1953	A floristic study of Cook County, Northeastern Minnesota; Rhodora	GRPO
	Flora of extreme northeast Cook Co., MN, based on field work of Butters between 1938 and his death in 1945, assembled and written by Abbe.			
22	Case, M., A., Beaman, J. H.	1992	*Heracleum mantegazzianum* (Giant Cow Parsnip): another exotic in the Michigan flora; Michigan Botanist	SLBE
	Authors document the presence of Giant cow parsnip (*Heracleum mantegazzianum*), a federally listed noxious weed, in Ingham County, Michigan, in 1991.			
23	Choi, Young D.	1992	Intensive vegetation analysis of three razed homesites of Indiana Dunes National Lakeshore	INDU
	Three razed homesites at Indiana Dunes National Lakeshore were analyzed for vegetative composition and abundance to provide data prior to an experiment comparing the effectiveness of eradication treatments on exotic species at restoration sites.			
24	Choi, Young D.	1994	Comparison of fire, herbicide, and sod removal to restore native vegetation in the razed residential sites in the Indiana Dunes National Lakeshore: A 3-year study	INDU
	Twenty-three experimental restoration plots were established at xeric, razed homesites at Indiana Dunes National Lakeshore. Four exotic plant eradication treatments (prescribed fire, herbicide application, sod removal, and a control) were evaluated for effectiveness.			
25	Choi, Young D.	1995	Effects of prescribed burning, herbicide, and sod removal on the restoration of native vegetation in razed residential sites of Indiana Dunes National Lakeshore: 4-year study	INDU
	Twenty-four experimental restoration plots were established at razed homesites at Indiana Dunes National Lakeshore. Four exotic plant eradication treatments (prescribed fire, herbicide application, sod removal, and a control) were evaluated for effectiveness.			
26	Choi, Young D., Pavlovic, Noel B.	1994	Comparison of fire, herbicide, and sod removal to control exotic vegetation; Natural areas journal	INDU
	The project used treatment of vegetative plots to study the effectiveness of prescribed burning, herbicide application, and sod and topsoil removal in discouraging the growth of exotic vegetation and encouraging the growth of native vegetation on razed residential sites at the Indiana Dunes National Lakeshore.			
27	Choi, Young D., Pavlovic, Noel B.	1995	Restoring native vegetation on Indiana Dunes razed residential sites; Park science	INDU
	Twenty-four experimental restoration plots were established at razed homesites at Indiana Dunes National Lakeshore. Four treatments (prescribed fire, herbicide application, sod removal, and a control) were evaluated for effectiveness of eradicating exotic plant species at restoration sites.			

28	Cole, Kenneth L., Hiebert, Ronald D., Wood, James D., Jr.	1987	Historical impacts on communities in disequilibrium; Proceedings of the first Indiana Dunes research conference: Symposium on plant succession	INDU
	The paper provides information about successional changes in the vegetation of the Indiana Dunes National Lakeshore since 1850 A.D. Specifically, it concentrates on the past history and present dynamics of the white pine forest and prairie communities of the park. Using information from presettlement land surveys, historic aerial photos, and fossil pollen, a comparison is made between the vegetation of today and the historic species composition and density of the area's vegetation. The concept of "inertia" of established vegetation is also discussed.			
29	Cole, Kenneth; Laroe, Edward T., Farris, Gaye S., Puckett, Catherine E., Doran, Peter D., Mac, Michael J.	1995	Vegetation change in National Parks; Our living resources: A report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems	PIRO
	Pollen analysis from 12-Mile Bog in Pictured Rocks National Lakeshore, MI revealed that the vegetation was more disturbed by logging and slash burning in the late 1800's than by any periodic wildfires during the previous 2,500 yrs. The forest is similar in the 1990s to what it was 2,000 yrs ago.			
30	Cooper, William Skinner	1914	A catalogue of the flora of Isle Royale, Lake Superior; annual report of the Michigan Academy of Science	ISRO
	Lists plant specimens, including habitat descriptions, collected on field trips in 1909 and 1910.			
31	County Biological Survey	1993	Minnesota vascular plant County Checklist [Pine, Chisago, Washington]	SACN
	This checklist covers the Minnesota counties along the St. Croix River. The information includes state status, number of plants located, native vs. non, and location by county. All plants are given by scientific name. A key is also provided.			
32	Cowles, Henry Chandler	1899	The ecological relations of the vegetation on the sand dunes of Lake Michigan; Botanical Gazette	SLBE
	Explores and discusses the dynamics of vegetation succession on the shifting dunes of eastern Lake Michigan. After a geological and physical description of the dunes along eastern Lake Michigan, the different plant assemblages are described and discussed as they relate to successional stages.			
33	Crawford, David	1987	Preliminary checklist of plants of the St. Croix Riverway, revised edition	SACN
	The document is a checklist of plants found at the St. Croix National Scenic River and other parks that fall within its boundaries. The possibility of human consumption of each species is noted, as well.			
34	Crawford, David	1990	Interstate State Park prairie remnant survey, July to August 1990	SACN
	Identifies and surveys small prairie areas in Interstate State Park. These sites include hill prairies, oak savannahs, and basalt glades, but none of the sites have been managed for prairie species. The sites are identified by general type, and approximate size and location are described. Substrate composition, slope, prairie indicator species, invader species, canopy species, and other species at the sites are also identified.			
35	Crispin, Susan R.	1989	Passage Island; Michigan natural resources	ISRO
	Passage island provides rare habitat for many plant species that are generally limited to the far northern latitudes, due to the sub-arctic habitat maintained by the refrigerating effect of Lake Superior's waters.			
36	Crispin, Susan R., Chapman, Kim Alan, Keeney Marr, Janet	1985	A comprehensive survey of the rare, threatened, and endangered plants on Passage Island, Isle Royale National Park	ISRO
	A total of 29 plant species considered threatened or of special concern in Michigan were found and their distributions mapped on Passage Island. Many of these are also of regional or national rarity and/or significance. Several Species were found that were not previously documented from the Island, many of which are exceedingly rare in the main portion of the Park. One species never before found in Michigan or on Lake Superior, *Draba glabella* was located. Data were also gathered on habitats and conservation/management needs of these species.			

37	Crispin, Susan R., Dunevitz, Vicki L., Katz, Debra, Chapman, Kim Alan	1984	A survey for endangered, threatened, and special concern plant species in Pictured Rocks National Lakeshore, Michigan	PIRO
	Field work over 5 days was conducted in 1984 to locate 19 plant species listed as endangered, threatened, or special concern from Pictured Rocks National Lakeshore, MI. Plants were identified in the field and at least one of each species was collected to document the identification. Data on habitat and distribution of 11 species in the Lakeshore were collected. They are: *Aster nemoralis* , *Callitriche hermaphroditica* , *Calypso bulbosa* , *Cirsium pitcheri* , *Crataegus douglasii* , *Crypogramma stelleri* , *Cypripedium arietium* , *Elymus glaucus* , *Elymus mollis* , *Empetrum nigrum* , *Listera auriculata* , *Lycopodium complanatum* , *Myriophyllum alterniflorum* , *Myriophyllum farwellii* , *Osmorhiza depauperata* , *Pinguicula vulgaris* , *Stellaria longipes* , *Tanacetum huronense* , and *Trisetum spicatum* . Distribution maps for 18 species are provided. An appendix contains computerized element occurrence information.			
38	Crispin, Susan R., Dunevitz, Vicki L., Keeney Marr, Janet	1984	A survey for endangered, threatened, and special concern plant species in Isle Royale National Park, Michigan	ISRO
	Field surveys were conducted in certain areas (Rock Harbor, Mott Island, and Windigo) of Isle Royale National Park to ascertain the status of plant species listed or proposed as endangered, threatened, or special concern at the state and federal level. A second survey priority was to collect data on plants listed as federal or state endangered species in other areas in the park and to survey plants which occur or survive in Michigan only on Isle Royale. Visits were made to Passage Island to collect data on several species of particular concern and to document the concentration of rare plant species reported to occur there. As a result of these surveys, distributional data were collected on thirty-one special plant species in the Park. Maps found in the appendices show location for special plant species found during these surveys. Collected species are held in the Beal-Darlington Herbarium at Michigan State University, East Lansing, Michigan.			
39	Crowe, J.	1993	Checklist of vascular plants of Thunder Bay District (Ontario)	ISRO
	no abstract available			
40	Crowley, Katherine F.	1995	Patterns of temporal and spatial change in the vegetation of Voyageurs National Park	VOYA
	Patterns of compositional change in the vegetation of Voyageurs National Park, northern Minnesota were studied through an analysis of permanent-plot data collected in 1977-78 and 1992-93. The park's vegetation is a mosaic of single and mixed-species conifer and hardwood trees. This study examined significant compositional changes and rate of change in the vegetation, in the context of successional processes, fire and land-use history, spatial scale, and predictability of future change. Changes during the study period included slow, expected aging of currently undisturbed vegetation types, maturation and extensive senescence of trees in disturbance-dependent types, and rapid, inconsistent change in recently disturbed or recovering types.			
41	Cultural Resources Staff	1993	Rare plant report - Isle Royale National Park: specimens in the Isle Royale Herbarium Collection	ISRO
	For rare plant specimens found on Isle Royale, this report lists the herbarium catalog number, scientific name, collection site, habitat or depositional environment, and data and source of identification.			
42	Curtis, John T.	1974	Vegetation of Wisconsin	SACN
	This work is the basic guide to the flora in the state and region. After a general look at the way flora and vegetation are to be presented, an overview of the environment of Wisconsin is shared, as is a definition of plant communities and their distribution. Next, sections and subsections are given for each plant community studied. Finally provided is a summation of inventories along with figures, tables, and maps of raw data.			
43	Endangered Species Program, Michigan Department Of Natural Resources, Michigan Natural Features Inventory	1992	Michigan's special plants: endangered, threatened, special concern, and probably extirpated	ISRO, PIRO, SLBE
	The list contains all plant species in the state of Michigan that were considered endangered, threatened, probably extirpated, or of special concern either by the federal government or the State of Michigan on November 14, 1991.			

44	Fernald, M.L.	1935	Critical plants of the Upper Great Lakes region of Ontario and Michigan; Rhodora	ISRO
	In this paper Professor Fernald discussed at length an impressive assemblage of species among the vascular plants, known principally from the Rocky Mountains and the Pacific coast but occurring also in isolated colonies on the Keweenaw Peninsula and a few other restricted areas, possibly unglaciated during the Pleistocene, far east of their principal range. Includes species found on Isle Royale.			
45	Foster, Robert F., Harris, Allan G.	2001	Invasive plants survey: Voyageurs National Park	VOYA
	An invasive plant survey was conducted in Voyageurs National Park, Minnesota. Exotic plants were ranked using the system developed by Hiebert and Stubbendiek (1993) based on field evidence and a literature review. Each species was assigned a score based on its current impact, innate ability to become a pest, and feasibility of control. A total of 117 species of exotics is known from the park. Exotic species are uncommon in undisturbed communities and at backcountry campsites. They are more common at heavily disturbed sites at the periphery of the park.			
46	Fuller, George W.	1918	Some perched dunes of northern Lake Michigan and their vegetation; transactions of the Illinois State Academy of Science	SLBE
	Describes the vegetation of perched dunes of northern Lake Michigan. Vegetation is described for two types of perched dunes: Nipissing beach dunes and high perched dunes. Nipissing beach dune vegetation is described for South Fox Island, Beaver Island, and High Island. High perched dune vegetation is described for the dunes just north of Frankfort, Sleeping Bear Dunes of Sleeping Bear Dunes National Lakeshore, Michigan, and South Fox Island.			
47	Glenn-Lewin, David C.	1987	Prairies and grasslands of the St. Croix National Scenic Riverway, Wisconsin and Minnesota	SACN
	The report describes a study to completely identify and describe the prairies and grasslands of the St. Croix National Scenic River. A baseline inventory of the prairie communities was conducted, and the vegetation was analyzed. Management recommendations are made for the future management of the prairies and grasslands.			
48	Glenn-Lewin, David C.	1991	Plant species and environments along the proposed North Country Trail in the stretches where it occurs within the St. Croix National Scenic Riverway, Wisconsin.	SACN
	The portions of the North Country Trail that fall within the St. Croix National Scenic River were divided into five segments. The segments were walked by two individuals, and the habitat and vegetation were characterized. Investigators also searched for rare and endangered species.			
49	Glenn-Lewin, David C., Ver Hoef, Jay M.	1988	Prairies and grasslands of the St. Croix National Scenic Riverway, Wisconsin and Minnesota; Prairie naturalist	SACN
	The article discusses the results of a 2 year prairie inventory and analysis in the St. Croix Riverway. Basalt glade, hill prairie, and sandy pine barrens were the 3 main prairie types encountered in the 54 prairie areas surveyed. The 3 types are discussed separately, including information on the leading plant species in each type.			
50	Glime, Janice, Zhang, Jinkun, Plante, Nadine, Li, Na, Li, Yenhung, Marr, Janet, Liao, Chiang-Liang	1991	A final report on survey of Bryophytes: Beaver Rim Road right-of-way, Area 1, the Pictured Rocks National Lakeshore, Michigan, USA	PIRO
	1,500 bryophyte specimens were collected in May 1991 in Pictured Rocks National Lakeshore, Michigan. The purpose of the study was to identify impacts to the liverwort and moss communities if the proposed Beaver Basin Rim Road were to be built. Collections were made from several habitats, including Lake Superior shoreline, coniferous forest, hardwood forest, mixed hardwood, and wetlands. 128 species of mosses and 13 species of liverworts were identified from the proposed road corridor. Of these, 15 species are reported to be uncommon or rare. Bug-on-a-stick moss (*Buxaumia aphylla*) was found for the first time in the Lakeshore and is of special interest, although not particularly rare. Bryophytes are discussed by habitat type. A thorough review of the literature was completed, and a list of 162 moss species and varieties and 35 liverwort species known from throughout Pictured Rocks National Lakeshore is also included. Management suggestions for the preservation of habitat for the mosses and liverworts are provided.			
51	Guire, K.E., Voss, E.G.	1963	Distributions of distinctive shoreline plants in the Great Lakes region; Michigan Botanist	ISRO
	no abstract available			

52	Hazlett, Brian T.	1991	The flora of Sleeping Bear Dunes National Lakeshore, Benzie and Leelanau Counties, Michigan; The Michigan Botanist	SLBE
	Discusses the common plant communities of Sleeping Bear Dunes National Lakeshore, Michigan by geographical units: Platte River, Sleeping Bear Dune, Good Harbor Bay, Bow Lakes, and Manitou Islands. There is a checklist of vascular plants found in the Lakeshore. The list is divided into four major groups (pteridophytes, gymnosperms, monocotyledons, and dicotyledons). Within each group the families are listed alphabetically. For each species the following are listed: scientific name, common name(s), abundance estimates, preferred habitat, collection numbers, and where it can be found in Sleeping Bear Dunes National Lakeshore (mainland, South and/or North Manitou Islands).			
53	Hendrickson, William H., Wilcox, Douglas A.	1979	Relationship between some physical properties and the vegetation found in Cowles Bog National Natural Landmark, Indiana	INDU
	The paper is a basic evaluation of the vegetation at Cowles Bog National Natural Landmark within the Indiana Dunes National Lakeshore. Past studies and current threats to the natural environment are considered. Species lists are included, along with water chemistry characteristics, maps, and a diagram of cross sectional aspect.			
54	Hiebert, Ron, Klick, Ken	1988	Exotic plant species ranking system; Natural Areas Journal	INDU
	Exotic plant species at Indiana Dunes National Lakeshore were ranked to evaluate their threats to the park's ecosystem.			
55	Hiebert, Ronald D.	1990	An ecological restoration model: application to razed residential sites; Natural Areas Journal	INDU
	The article describes an ecological restoration model that was applied at Indiana Dunes National Lakeshore. Twelve residential sites were razed and the model was applied to restore the sites back to black oak woodlands. Possible future uses of the model are discussed, as well.			
56	Hiebert, Ronald D., Pavlovic, Noel B.	no date	Past land use effects on succession in razed residential sites at the Indiana Dunes	INDU
	The paper documents the effects of specific land uses (drive, garden, house, and lawn) on early succession in razed residential sites at the Indiana Dunes National Lakeshore. Successional patterns in species composition and richness are examined with the role of the residual vegetation, soil structure and fertility, and seed source factors in the succession process. Observations for the project were compared with predictions of current succession models. Data tables and figures including maps of past and present land uses, species richness, soil compaction, and other soil characteristics are included.			
57	Holt, W.P.	1909	Notes on the vegetation of Isle Royale, Michigan	ISRO
	An annotated list of plants collected on Isle Royale in 1905, found in four principal areas: bog societies, shore societies, forests, and burnings. Total number of species listed is 364; of this number there are 43 species of lichens, 38 species of mosses, 35 species of Pteridophytes, and 248 species of Spermatophytes.			
58	Huber, James K.	1993	A vegetational reconstruction for an archaeological site on East Bearskin Lake, Cook County, Northeast Minnesota	GRPO
	no abstract available			
59	Janke, Robert A.	1981	The flora and vegetational ecology of Isle Royale National Park Annual progress report to National Park Service, 1981	ISRO
	no abstract available			
60	Janke, Robert A.	1982	The flora and vegetational ecology of Isle Royale National Park Annual progress report to National Park Service, 1982	ISRO
	no abstract available			
61	Janke, Robert A.	1993	Report on a rare plants search at the Windigo gasoline tank site	ISRO
	Reports on the presence of national listed or state listed endangered or threatened plants at a site near Windigo where new gasoline storage tanks are to be installed.			

62	Janke, Robert A., Slavick, Allison	1983	The flora and vegetation ecology of Isle Royale National Park	ISRO
	A 5 year study (1978-1983) of the vegetation of ISRO was made; this included producing a complete annotated list of all the 699 vascular plants. This report discusses results of studies into species composition and primary succession on the exposed rocky shores of Lake Superior, the ecology of three types of post-fire successional forest communities, reproduction of some boreal forest species, effects of moose and beaver on the park's vegetation, and revegetation of recent burns.			
63	Judziewicz, Emmet J.	1993	Inventory and monitoring of rare vascular plants, Apostle Islands National Lakeshore, Wisconsin; Apostle Islands National Lakeshore Research Reports	APIS
	A parkwide rare plant inventory was conducted in Apostle Islands National Lakeshore. This report on the rare flora accounts for all vascular plant species listed by the Wisconsin Department of Natural Resources as either endangered, threatened or species of concern and known from a documented population from within the boundaries of the lakeshore. In addition, three species not listed by the Wisconsin DNR are included in the report because, based on their rarity in Wisconsin, they should be considered for listing. For each species, the following information is given: scientific name; common name; The Nature Conservancy's heritage code; plant family; federal status; Wisconsin status; Apostle Islands National Lakeshore status; distribution on a worldwide basis; habitat and associated within the lakeshore; appearance and similar species; reproductive biology; historically known populations within the lakeshore; populations newly discovered in the lakeshore during this survey; potential threats; and monitoring recommendations.			
64	Judziewicz, Emmet J.	1993	Rare vascular plants of the St. Croix National Scenic Riverway; St. Croix River research rendezvous	SACN
	Rare plants were located, mapped, and surveyed at the St. Croix National Scenic Riverway to describe population characteristics of 26 state and federal listed species.			
65	Judziewicz, Emmet J.	1994	Copies of 1994 field notes	ISRO
	Photocopies of Dr. Judziewicz's field notes pertaining to his survey of rare plants on Isle Royale.			
66	Judziewicz, Emmet J.	1994	"Conjectural" human impacts on rare vascular plants of Isle Royale (excluding climate change, moose impacts)	ISRO
	Lists rare species found on Isle Royale and possible impacts humans may have on these plants.			
67	Judziewicz, Emmet J.	1994	Inventory and monitoring of rare vascular plants, St. Croix National Scenic Riverway, Minnesota and Wisconsin	SACN
	The document contains the most complete list of rare plants found along the river. Each entry contains scientific and common names, location map, federal and state (both Minnesota and Wisconsin) status, distribution, habitat, biology, threats, and monitoring recommendations. A list of slides taken by the author is included and twenty slides of monitoring plots are provided. A quick reference to monitored plots is furnished.			
68	Judziewicz, Emmet J.	1995	Inventory and establishment of monitoring programs for special floristic elements at Isle Royale National Park, Michigan Volume I of II	ISRO
	Because of the length of this document, it is published in two volumes. The second volume has its own entry into this website, Bibkey ID # 66504. The appendices of this report also have separate website entries because they pertain to specific plants. This project had five purposes: (1) to ascertain the status of plant species listed as endangered, threatened, or special concern by the state of Michigan, plus unlisted species that are rare on Isle Royale and grow on rock shores, forested areas at and near developed areas, and other vulnerable sites in the park, concentrating on those species specific to rock shoreline habitats and forest communities in developed zones; (2) develop an Isle Royale Sensitive Plant Species list; (3) Establish a monitoring system for select species in rockshore habitats; (4) determine the effects of different management practices and Park uses on the special floristic elements of the rock shore community and other inventoried sites; and (5) make management recommendations for the maintenance of these species populations.			

69	Judziewicz, Emmet J.	1995	Inventory and establishment of monitoring programs for special floristic elements at Isle Royale National Park, Michigan Volume II of II	ISRO
	This document is divided into two volumes because of its length. Volume 1 is entered in this website as Bibkey ID #66503. The appendices of this document also have separate website entries. This project had five purposes: (1) To ascertain the status of plant species listed as endangered, threatened, or special concern by the state of Michigan, plus unlisted species that are rare on Isle Royale and grow on rock shores, forested areas at and near developed areas, and other vulnerable sites in the park, concentrating on those species specific to rock shoreline habitats and forest communities in developed zones; (2) Develop an Isle Royale Sensitive Plant Species list; (3) Establish a monitoring system for select species in rock shore habitats; (4) Determine the effects of different management practices and Park uses on the special floristic elements of the rock shore community and other inventoried sites; and (5) Make management recommendations for the maintenance of these species populations.			
70	Judziewicz, Emmet J.	1995	Appendix of vegetation and flora of Passage Island, Isle Royale National Park, including the re-discovery in Michigan of mountain-cranberry (*Vaccinium vitis-idaea*) (draft); Inventory and establishment of monitoring programs for special floristic elements at Isle Royale National Park volume II of II	ISRO
	Passage Island contains the most concentrated assemblage of arctic-alpine plant species in the midwestern U. S. including devil's club (*Oplopanax horridus*), rock whitlow-grass (*Draba glabella*), hoary whitlow-grass (*Draba incana*), and mountain-cranberry (*Vaccinium vitis-idaea*). This report contains descriptions of the plant communities on Passage Island, the rediscovery of *Vaccinium vitis-idaea* in Michigan, and the history of botanical research at Passage Island. Includes a checklist of 278 vascular plant species from Passage Island; the list includes 27 alien species, 28 pteridophytes, 9 gymnosperms, 70 monocots, and 141 dicots. Where appropriate, plants are identified as being an alien exotic, threatened or of special concern in Michigan.			
71	Judziewicz, Emmet J.	1995	Appendix of vascular plants of Davidson Island (Boreal Research Laboratory), Isle Royale National Park, Michigan (draft); Inventory and establishment of monitoring programs for special floristic elements at Isle Royale National Park volume II of II	ISRO
	A listing of 145 vascular plant species found on Davidson Island at Isle Royale National Park. Includes exotic species, and special concern or threatened species in Michigan (16).			
72	Judziewicz, Emmet J.	1995	Encounter frequency indices of arctic/alpine plant species of Isle Royale National Park	ISRO
	For rare plant species found in the park, lists number of sites found and ranking by frequency. For specific areas of the park, lists number of rare species found in each area.			
73	Judziewicz, Emmet J.	1995	Special plant form - *Prosartes (Disporum) trachycarpum*	ISRO
	Gives the location, colony size, population size, and other information on a rare plant found on Isle Royale, *Prosartes (Disporum) trachycarpum* .			
74	Judziewicz, Emmet J.	1996	Monitoring of rare vascular plants, Apostle Islands National Lakeshore, Wisconsin	APIS
	In 1990-1992, the rare vascular plants of the Apostle Islands were inventoried and monitoring plots emplaced for selected species. Many of these monitored sites were revisited and rare species re-censused in 1996. The most significant new finds since 1992 were the endangered mountain-cranberry (*Vaccinium vitis-idaea*) on the Squaw Bay cliffs, new to the Lakeshore and only the second extant population in the state; the threatened downy oatgrass (*Trisetum spicatum*) on Devils Island and Sand Point; and sites for the special concern species fir clubmoss (*Lycopodium selago*) on Devils Island and the Squaw Bay cliffs, least moonwort (*Botrychium simplex*) on North Twin Island and Stockton Island Presque Isle Point, adder's-tongue fern (*Ophioglossum vulgatum*) on North Twin Island, smaller purple-flowered bladderwort (*Utricularia resupinata*) on Outer Island, Robbins' spikerush (*Eleocharis robbinsii*) on Michigan Island, and smaller yellow water-lily (*Nuphar microphyllum*) in the lagoon at Little Sand Bay.			

75	Judziewicz, Emmet J.	1999	Inventory and establishment of monitoring programs for special floristic elements at Isle Royale National Park, Michigan	ISRO
	The purpose of this project was to: 1) ascertain the status of plant species listed as endangered, threatened, or special concern by the State of Michigan, plus unlisted species that are rare on Isle Royale and grow on rock shores, forested areas at and near developed areas, and other vulnerable sites in the southwestern half of the Park, concentrating on those species specific to rock shoreline habitats and forest communities in developed zones; 2) re-survey a monitoring system for select species in rock shore habitats; 3) determine the effects of different management practices and Park uses on the special floristic elements of the rock shore community and other inventories sites; and 4) make management recommendations for the maintenance of these species' populations. This report gives accounts of 37 rare plant species describing the name, family, distribution and conservation status, habitat and associates at Isle Royale, appearance and similar species, reproductive biology, historically known populations at Isle Royale, populations newly discovered in Isle Royale, potential threats, monitored populations and monitoring recommendations.			
76	Judziewicz, Emmet J.	1999	Isle Royale National Park aquatic vascular plant species	ISRO
	This short report is a listing of aquatic vascular plants on Isle Royale. This list contains only species found in the inland lakes and ponds of Isle Royale, including very sheltered harbors. It excludes the very diverse bedrock beach and splash pool communities on Lake Superior. Also excluded are areas with very shallow water and dense vegetation mats such as bogs, marshes, and beaver ponds.			
77	Judziewicz, Emmet J.	2003	Review of vascular plant species lists for nine Midwestern National Parks, Monuments, Lakeshore and Riverways: a final report	APIS, GRPO, INDU, ISRO, MISS, PIRO, SACN, SLBE, VOYA
	Vascular plant species lists were reviewed for the nine Great Lakes Network parks. The author determined the percentage of documented species within each park and compared the floristic richness of each park with typical similar areas of the Midwest. This report includes extensive appendices, hard copy only, with corrections of park status and nomenclature for all plant species.			
78	Judziewicz, Emmet J., Kenner, Brian	1994	Rare vascular plants of Isle Royale's rocky shoreline; Lake Superior National Parks research conference	ISRO
	A summary of field work in August 1993 and May-September 1994 to locate map and monitor population characteristics of Michigan endangered, threatened, or special concern vascular plant species found on the rocky shorelines of Isle Royale National Park. Thirty-eight permanent plots were established to monitor shoreline species.			
79	Judziewicz, Emmet J., Koch, Rudy G.	1993	Flora and vegetation of the Apostle Islands National Lakeshore and Madeline Island, Ashland and Bayfield Counties, Wisconsin	APIS
	A survey of the vascular flora of the Apostle Islands National Lakeshore and Madeline Island, Wisconsin, was conducted from 1972-1992. Floristically the archipelago is part of the hemlock/white pine/northern hardwoods forest, with a few boreal and sub-arctic elements such as fir clubmoss (*Lycopodium selago*), butterwort (*Pinguicula vulgaris*), bird's-eye primrose (*Primula mistassinica*), plains ragwort (*Senecio indecorus*), and spike trisetum (*Trisetum spicatum*). The catalog of 810 species and hybrids includes four species new to Wisconsin: two native, subarctic willows (*Salix pellita* and *S. planifolia*), a Eurasian sedge new to the Great Lakes region (*Carex ovalis*), and a European rush new to North America (*Juncus squarrosus*). The only Wisconsin stations for woodland cudweed (*Gnaphalium sylvaticum*) and black hawthorn (*Crataegus douglasii* , probably introduced) also occur on the islands. The federally listed lake cress (*Armoracia lacustris*) occurs in the Lakeshore, along with 37 state listed species: 25 of special concern, 10 threatened, and two endangered.			
80	Judziewicz, Emmet J., Nekola, Jeffery, C.	1997	Recent Wisconsin records for some interesting vascular plants in the western Great Lakes region; The Michigan Botanist	ISRO, PIRO
	Abundance and distribution data of 21 rare vascular plant species from the western Great Lakes region are presented. Several species are found at Apostle Islands National Lakeshore, WI; Isle Royale National Park, MI; and/or Pictured Rocks National Lakeshore, MI. Those found at Pictured Rocks National Lakeshore include *Mertensia paniculata* , *Myriophyllum alterniflorum* , and Pyrola minor. The authors discuss *Lycopodium selago* , *Mertensia paniculata* , *Myriophyllum alterniflorum* , *Pirola minor* , and *Vaccinium vitis-idaea* from Isle Royale National Park. *Armoracia lacustris* , *Carex pallescens var. neogaea* , *Gnaphalium sylvaticum* , *Listera convallarioides* , *Lycopodium selago* , *Pinguicula vulgaris* , *Streptopus amplexifolius* , *Trisetum spicatum* , and *Vaccinium vitis-idaea* can be found at Apostle Islands National Lakeshore. Distribution maps accompany the discussion of each species.			
81	Judziewicz, Emmet J., Van Stappen, Julie F.	1993	Rare vascular plants of Isle Royale's rocky shoreline; Lake Superior National Parks research conference	ISRO
	Michigan's endangered, threatened, and special concern vascular plant species were located, mapped, and monitored at Isle Royale National Park in 1993. Twenty-one permanent plots were established from the Caribou Islands to Bat Island, and along the mainland shoreline from Daisy Farm campground to Scoville Point.			

82	Judziewicz, Emmet J., Van Stappen, Julie	2000	Inventory and monitoring of the rocky areas of the Lake Superior shoreline, Isle Royale National Park, 1998; Lake Superior National Parks research conference and Chequamegon Bay natural resources conference	ISRO
	The established plots on the rocky shorelines of the western portion of Isle Royale were surveyed for plants in 1998.			
83	Klick, Kenneth, O'Brien, Sandra, Lobik-Klick, Linda	1989	Exotic plants of Indiana Dunes National Lakeshore: a management review of their extent and implications	INDU
	A ranking system was created at Indiana Dunes National Lakeshore to describe the amount of impact imposed by each exotic plant species in the park. An exotic plants list was created from previously collected baseline data and new survey data. Hiebert's (1987) Exotic Plant Species Ranking System was used to determine the possible extent of impacts. Maps containing exotic plant locations are included.			
84	Koch, Rudy G.	1978	Preliminary checklist of the vascular plants of the Apostle Islands National Lakeshore	APIS
	The report includes a preliminary checklist of the vascular plants of Apostle Islands National Lakeshore.			
85	Konkel, Deborah	2000	St. Croix River vegetation study: 1999	SACN
	A quantitive vegetation study of aquatic plants on the St. Croix River was conducted during August of 1999. The diversity, density, and distribution of plants were determined. The data was used to determine the general water quality of the river.			
86	Kuehn, Jerome H., Niemuth, Wallace, Peterson, Arthur R.	1961	A biological reconnaissance of the Upper St. Croix River	SACN
	The report describes a survey conducted along the Minnesota-Wisconsin boundary to aid in the improvement of the St. Croix River fishery. Fish and substrate data were collected, and plant types were noted. Some water quality information was also obtained.			
87	Larson, Jennifer, Larson, Diane	2004	2003 annual report: inventory of the distribution and abundance of invasive non-indigenous plants and rare plants at two riverine national parks in the Great Lakes Network	MISS, SACN
	The report discusses the progress made on inventories of exotic and rare plants at Mississippi National River and Recreation Area and St. Croix National Scenic River. Data from past inventories were collected from various agencies and analyzed. Known locations of rare plants at both of the parks were inventoried, as well. Field methods to be used in 2004 were then tested at Battle Creek and Coon Rapids Dam Regional Parks.			
88	Loope, Walter L.	1992	Survey for state and federal listed plants and review of ecological conditions along the proposed Beaver Basin Rim Road corridor, Pictured Rocks National Lakeshore	PIRO
	State of Michigan special concern and threatened plant species that grow in Pictured Rocks National Lakeshore, MI are listed. Their habitats within the Lakeshore are described. Those that may grow in the corridor of the proposed Beaver Basin Rim Road are discussed more fully. Methods used to determine these species were: examination of the literature on rare plant studies and their ecological requirements, field surveys in the potential corridor, examination of aerial photographs for habitat types, and interpretation of permanent forest transects that were established between 1984 and 1987. No listed species were found to occupy the corridor; however, it is recommended that 3 small bogs near the corridor should be avoided when planning the final route. A continued search for flattened oats (Danthonia compressa) in openings and old logging roads and the blueberry Vaccinium caespitosum along old railroad grades also should be undertaken. Appendices provide data concerning understory plant species from permanent transects in the proposed corridor.			
89	Loope, Walter L.	1992	A survey for rare vascular plants and review of ecological conditions along the proposed Beaver Rim Road corridor, Pictured Rocks National Lakeshore, Michigan	PIRO
	In accordance with the legislation that created Pictured Rocks National Lakeshore in 1966, a scenic lakeshore road, "Beaver Rim Road", was designed. The National Park Service was concerned the road would impact rare vascular plants in the area, so the road corridor was surveyed for rare plant species.			
90	Loope, Walter L., Allen, Jason, Oppenhuizen, Chad	1997	A monitoring program for dune vegetation at North Bar Lake, Sleeping Bear Dunes National Lakeshore	SLBE
	Description of the vegetation around North Bar Lake in 1996, to be used as a baseline for monitoring changes. Established permanent transects, measured percent cover for each species on plots and took photographs. Includes a list of species and their percent cover, color photos of the transects, color photos taken from 8 photo points, and a map (in pocket) showing the location of the photo points.			

91	Loope, Walter L., Crausbay, Shelley D. Kenner, Brian C.	1997	Landscape scale vegetation monitoring within Grand Sable Dunes near Grand Marais, MI; Lake Superior National Parks research conference	PIRO
	Lake level changes of the Great Lakes, ranging from decade-long to century-long, have caused periodic disturbance to coastal vegetation. Recent research on lake level fluctuations suggest that these changes are significantly greater than those recorded in historical times. The vegetation of Grand Sable Dunes at Pictured Rocks National Lakeshore, Michigan is not affected by direct wave action as lake levels rise, but by destabilization of the banks which allows loose sand from the slumped banks to become airborne and to bury vegetation on top of the dunes. Lower lake levels allow vegetation to become reestablished not only on the banks, but also on top of the dunes. Forest, shrub, and herbaceous vegetation patches shrink or expand in response to changes in sand supply from the banks. GPS units were used in 1997 to delineate vegetation patch boundaries. A nested, hierarchical classification system for vegetation patches was developed. A repeating, 5-10 year monitoring effort will document changes in patch size.			
92	Lyon, Marcus Ward Jr.	1927	List of flowering plants and ferns in the Dunes State Park and vicinity, Porter County, Indiana; The American Midland Naturalist	INDU
	This article lists the plants present in the dunes region of Porter County, in what is now the Indiana Dunes National Lakeshore. Both native and introduced plants are included in the list. A brief topography of the region is also included. The list includes each plant's common and scientific name, and location where it was found.			
93	Maercklein, Robin	2001	Exotic plants in the St. Croix National Scenic Riverway; Thirteenth annual St. Croix River research rendezvous	SACN
	Distribution and control of exotic species at the St. Croix National Scenic Riverway are discussed.			
94	Marquis, Robert J., Voss, Edward G.	1981	Distributions of some western North American plants disjunct in the Great Lakes region; Michigan Botanist	PIRO
	Vascular plant species of the Great Lakes region that are western disjuncts (exhibit a discontinuous geographic distribution with others in the western states) are identified and discussed. Each of the 28 species is categorized into 1 of 4 groups: 1) species found in the Great Lakes region and the western U.S. with no occurrence in the Black Hills of South Dakota; 2) species found in the Great Lakes region and the western U.S. with occurrence in the Black Hills; 3) species found in the Great Lakes region and the St. Lawrence area but not in the Black Hills; and 4) species found in the Great Lakes region, the St. Lawrence area, and in the Black Hills. Descriptions of each plant's distinctive morphological characteristics and habitat are given. Distribution maps are included. Those species found at Pictured Rocks National Lakeshore, MI (according to the categories listed above) are: group 1: Douglas thornapple (*Crataegus douglasii*) western fescue (*Festuca occidentalis*) group 2: trail plant (*Adenocaulon bicolor*) Melica smithii thimbleberry (*Rubus parviflorus*).			
95	Mason, Dan	2003	Cowles Bog floristic resources restoration	INDU
	Indiana Dunes National Lakeshore worked with numerous partners and participants to restore native vegetation to Cowles Bog. Methods used included building deer exclosures, propagating white cedar, reducing shrub cover and hybrid cattails, installing native plants, recovering orchids, and analyzing seed banks.			
96	McEachern, A. Kathryn	1992	Disturbance dynamics of Pitcher's Thistle (*Cirsium pitcheri*) populations in Great Lakes sand dune landscapes	PIRO, SLBE
	The population biology, community ecology, and landscape distribution of the native Pitcher's thistle (*Cirsium pitcheri*) were studied to understand its ecology for the purposes of conservation and recovery planning. The study sites at Indiana Dunes National Lakeshore, Indiana, Sleeping Bear Dunes National Lakeshore, Michigan, and Grand Sable Dunes of Pictured Rocks National Lakeshore, Michigan, span the latitudinal range of the species. Several aspects of Pitcher's thistle ecology are addressed and separate methods for each are presented. They are: the natural cycles of disturbance caused by movement of dune sand, the distribution of Pitcher's thistle at the three National Lakeshore study sites, disturbance and the abundance of Pitcher's thistle in nearshore dunes, comparison of successional stage and environmental changes, Pitcher's thistle population structure in plots with different successional stages and at the different Lakeshores. Data were collected for the various topics from among 8 transects at Pictured Rocks, 11 at Sleeping Bear, and 10 at Indiana Dunes National Lakeshores.			

97	Mceachern, A. Kathryn, Magnuson, Julie A., Pavlovic, Noel B.	1989	Preliminary results of a study to monitor *Cirsium pitcheri* in the Great Lakes National Lakeshores	PIRO
	A study of the distribution, habitats, community ecology, and population structure of the native dune thistle, *Cirsium pitcheri* , was undertaken at Pictured Rocks National Lakeshore, MI Sleeping Bear National Lakeshore, MI and Indiana Dunes National Lakeshore, IN to address concerns about threats to its habitat. Trampling of juveniles plants and loss of habitat to recreational use and land development are cited as threats to its survival. Dynamics of dune processes are identified as important to the biology of the species. It grows 5-8 yrs, flowers one season, and dies. Nineteen non-random vegetation plots of varying sizes and shapes were established among known populations of C. pitcheri in the three parks. Five plots were established at Indiana Dunes, 9 at Sleeping Bear, and 5 at Pictured Rocks National Lakeshore. These were either "demographic" or "counting" plots. A species list was compiled for each plot, as well as notes about topography. Percent cover for each species and the amount of litter and bare ground were recorded from each. Trends in species composition are indicated by indices of species diversity and evenness.			
98	Meeker, James	2000	Rational, protocol, and record of establishment for forest vegetation monitoring plots for Outer, Devils, Raspberry and York Islands, Apostle Islands National Lakeshore	APIS
	This study began in spring of 1997 and continued in 1998 and developed a long-term forest monitoring program. Permanent vegetation plots were established for monitoring forest vegetation changes on Apostle Islands National Lakeshore (APIS). Description of old growth and recover plots on Outer, Raspberry and Devils Islands for future comparisons to inland sites were made. Comparisons were made of: old growth plots on Outer Island to other Outer Island plots that were cut over different time frames (1920's to 1950's), recovery rates between logged sites and sites that were both logged and burned on Outer Island, and the old-growth mixed boreal forests of Raspberry and Devils Islands to similar habitat on York Island that was cut just prior to the APIS acquisition (1974).			
99	Meeker, James, Wilcox, Douglas A.	1989	A comparison of aquatic macrophyte communities in regulated and non-regulated lakes, Voyageurs National Park and Boundary Waters Canoe Area, Minnesota	VOYA
	The effects of water-level regulation on aquatic macrophyte communities, individual plant species, and potential faunal habitat were investigated in a study of regulated and unregulated lakes in northern Minnesota. We estimated the cover of each plant species in randomly placed quadrats along transects that followed depth contours in the lakes. These contours were selected to represent different plant habitats, as defined by the timing and duration of flooding and dewatering in unregulated Lac La Croix. Macrophyte communities at all depths of the regulated lakes differed from those in the unregulated lake. The differences were more profound in deeper parts of the littoral zone. Lac La Croix contained taxonomically and structurally diverse plant communities at all depths, maximizing faunal habitat. The macrophyte communities of the regulated lake systems would benefit from a return to more natural hydrologic regimes.			
100	Mehlhop, Patricia	1985	Endangered species on National Parks in the midwest, annual report, 1984	VOYA
	Xeroxed copy of just the one page from this document (and cover page) which pertains to the endangered plants and animals of Voyageurs National Park			
101	Monson, Paul H.	1984	Preliminary list of plant species in Voyageurs National Park	VOYA
	Alphabetical computer listing, by species name with common name included, of all the plants found in Voyageurs National Park.			
102	Monson, Paul H.	1988	Endangered, threatened, and special concern plants, Grand Portage National Monument, Grand Portage, Minnesota	GRPO
	This report supplements the 1985 Flora Checklist for Grand Portage National Monument (by same author) by providing specific information on the endangered, threatened, or special concern plants which are known to occur within the limits of Grand Portage NM. It provides a listing of all vascular plant taxa presently designated or nominated for Federal or State status and an evaluation of Grand Portages status to potentially contain these taxa based on habitat suitability.			
103	O'Brien Sandy	no date	Plant specimens identified from the Great Marsh	INDU
	The report identifies plant species found in the Great Marsh at the Indiana Dunes National Lakeshore. A map depicts plant collection sites and topography. For each site, there is a list of plant species identified, and date of collection.			
104	Overlease, William, Overlease, Edith	1975	Part I: Pteridophytes, Gymnosperms, Monocots; the flora of Benzie County, Michigan	SLBE
	Lists, by Family, all of the Pteridophytes, Gymnosperms, and Monocots found in Benzie County. Listed for each species: scientific name, common name(s), relative abundance, common habitat, and the locations in the county where specimens were collected.			

105	Overlease, William, Overlease, Edith	1985	Part I: ferns and fern allies; the flora of Benzie County, Michigan	SLBE
	Lists, by Family, the ferns and fern allies that can be found in Benzie County, Michigan. Listed for each species: scientific name, common name(s), common habitats, relative abundance, and the locations in the county where specimens were collected.			
106	Overlease, William, Overlease, Edith	1985	The vegetation of Benzie County, Michigan (from the introduction to the flora of Benzie County part I: Pteridophytes)	SLBE
	Briefly discusses and describes the various plant communities, landforms, and soil conditions found in Benzie County, Michigan. The vegetation changes (exotic and otherwise) observed in the county by the authors since 1964 are also discussed.			
107	Overlease, William, Overlease, Edith	1985	Part II: Gymnosperms and Monocots; the flora of Benzie County, Michigan	SLBE
	Lists, by Family, all of the Gymnosperms and Monocots found in Benzie County. Listed for each species: scientific name, common name(s), habitats, relative abundance, and the locations in the county where specimens were collected.			
108	Overlease, William, Overlease, Edith	1985	Part IV: The Sympetalous Dicotyledoneae; the flora of Benzie County, Michigan	SLBE
	Lists, by Family, all of the Sympetalous Dicotyledoneae found in Benzie County, Michigan. Listed for each species: scientific name, common name(s), habitat, relative abundance, and the location in the county where specimens were collected.			
109	Ownbey, Gerald B., Morley, Thomas	1991	Vascular plants of Minnesota - a checklist and atlas	VOYA
	Listing of all known vascular plants (native and non-native) occurring in Minnesota with a total of 1,210 species. Distribution maps are also presented for each species, and references to studies that documented the existence and location of the species.			
110	Pavlovic, Noel B.	1993	St Croix National Scenic Riverway threatened and endangered plants inventory and monitoring [draft]	SACN
	This study focused on three rare plants: flame flower, kittentails, and bog bluegrass. Study methods, species biology, and site locations are covered. The work concludes with management recommendations, literature cited, and site maps.			
111	Pavlovic, Noel B.	1995	Habitat, disturbance, density dependence and the abundance of fame flower (*Talinum rugospermum*)	INDU, SACN
	Factors explaining the distribution and abundance of fame flower (*Talinum rugospermum*) were investigated at the Indiana Dunes National Lakeshore and Saint Croix National Scenic River. The regeneration niche of the flower was investigated by sowing seeds across a successional disturbance habitat gradient. Demographic data was also collected from sites throughout the limits of the flower's range. The document includes an investigation of disturbance-dependent persistence of rare plants. Additionally, seedling performance of a restricted succulent herb as affected by density and precipitation across a successional gradient is examined.			
112	Pavlovic, Noel B., Bowles, Marlin L., Crispin, Susan R., Gibson, Thomas C., Herman, Kim D., Kavetsky, Robert T., McEachern, A. Kathryn, Penskar, Michael R.	2002	Pitcher's thistle (*Cirsium pitcheri*) recovery plan	PIRO, SLBE
	Status of the Pitchers's thistle (*Cirsium pitcheri*) in the Laurentian Great Lakes region is reviewed, including life history, habitat, genetics, ecology, threats, and data concerning distribution and abundance. The recovery plan for the conservation of this species is outlined.			
113	Pavlovic, Noel B., Bowles, Marlin L.; Davis, G.E., Halvorson, W.L.	1996	Rare plant monitoring at Indiana Dunes National Lakeshore; efficacy of long-term research in U.S. National Parks	INDU
	This chapter reviews the development, application, and achievements of the Indiana Dunes National Lakeshore threatened and endangered plant monitoring program. Biological, methodological, management, and administrative considerations are addressed through specific case studies. There is a description of the park ecosystems and vegetation, and a history of vegetative data management and collection. Internal and external threats to threatened and endangered plants in the park are explained in detail, with comments on the importance of inventory and monitoring. Maps and figures represent the study areas and data from monitoring efforts.			

114	Pavlovic, Noel B., Cole, Kenneth L.	1991	Check list of vascular plants of the Indiana Dunes National Lakeshore	INDU
	This is an alphabetical listing of the vascular plants that have been verified to occur at the Indiana Dunes National Lakeshore. Each family and species is listed phylogenetically under the appropriate division and class. Each species is listed in binomial form with the naming authority following the name. Habitats of the Indiana Dunes are also listed and defined.			
115	Pavlovic, Noel B., Loope, Walter L., Manke, Amy, Stumpf, Julie A., Hiebert, Ron, Judziewicz, Emmet J., Siterlet, Catherine L., Ford, Tom W., Balzer, Trevor, Kinzinger, Ann, Ridlbauer, Jeremy, Braden, Beverly	2001	Interim report: survey and ranking of non-indigenous, invasive plants for four national lakeshores: 1998-2000	PIRO, SLBE
	Vegetation plots in 4 Great Lakes coastal national lakeshores were surveyed during 1998-1999 to measure abundance and distribution of non-indigenous plants. The number of plots sampled in each lakeshore varied: 618 at Indiana Dunes National Lakeshore, IN; 834 at Pictured Rocks National Lakeshore, MI; 927 at Sleeping Bear Dunes National Lakeshore, MI; and 1431 at Apostle Islands National Lakeshore, WI. All plants within the plots were identified, whether native or non-native, and their relative abundances and locations were recorded. Frequency of non-indigenous species by plot and by random transect are reported for 3 of the lakeshores and frequency by plot and by island for Apostle Islands National Lakeshore. Vectors and patterns of invasion and establishment are categorized. Seven significant, non-native species are discussed individually.			
116	Peattie, Donald Culross	1930	Flora of the Indiana Dunes: a handbook of the flowering plants and ferns of the Lake Michigan coast of Indiana and of the Calumet District	INDU
	This book is a comprehensive listing of the flowering plants and ferns of the Indiana Dunes region. For each species, there is a physical description and habitat description. A guide to plant hunting in the Dunes is included, with a lesson on how to use a key, an analytical key to the families, and a systematic list of the families, genera, and species. There is also a glossary of terms, and map of the area. A few photographs are also included.			
117	Pestana, Karen E.	1985	Problem exotic plants in selected parks of the Midwest Region and a bibliography on their management; Research/Resources Management Report	GRPO, SACN
	This report identifies the most pervasive and threatening exotic plant species in 19 out of 30 national park units in the Midwest region. A bibliography of literature on the control or management of each species is provided, along with a master list of all the exotic species present in each park unit based on their species checklists. Information regarding Grand Portage National Monument has been highlighted.			
118	Pictured Rocks National	1990	Action plan for spotted knapweed (*Centaurea maculosa*)	PIRO
	An action plan for the removal of the exotic plant spotted knapweed (*Centaurea maculosa*) at Pictured Rocks National Lakeshore, MI describes the problem this species creates and guidelines for monitoring and removal. Eradication plans are described for specific areas. The effectiveness of physical/mechanical removal is compared to biological and chemical methods of control. The file folder also contains various data sheets and photocopies of aerial photographs with locations of known populations of spotted knapweed.			
119	Pictured Rocks National Lakeshore	1993	Bishop weed and vinca	PIRO
	This file folder contains observation notes and maps showing the locations of goutweed or biship weed (*Aegopodium podagraria*) and vinca vine (*Vinca minor*), 2 species of exotic plants, in Pictured Rocks National Lakeshore, MI.			
120	Pictured Rocks National Lakeshore	1994	Case incident record; exotic plants	PIRO
	Account is given of the observation and eradication of a single purple loosestrife (*Lythrum salicaria*) plant along the west Chapel Trail not far from the Chapel parking lot at Pictured Rocks National Lakeshore in September 1994.			

121	Pictured Rocks National Lakeshore	1979	Resources management plan, vegetation management program alternatives	PIRO
	A vegetation management plan is identified as necessary to Pictured Rocks National Lakeshore, MI because the Lakeshore is a long, narrow strip of land with a large perimeter that exposes the Lakeshore to outside influences, because the past logging and fire practices have modified vegetation, and because the cliffs and the Grand Sable Dunes sections of the Lakeshore are sensitive to erosion. Management plans and their alternatives are outlined for 6 facets of vegetation in the Lakeshore. They are: fire management, plant disease and pest management, roadside, trail, and hazardous vegetation management, endangered and threatened plant species management, exotic plant species management, and developed area vegetation management. Checklists of endangered and threatened plants in Michigan are included.			
122	Plampin, Barbara, Newgent, Myrna	1994	Rare plant investigations at Indiana Dunes National Lakeshore: Tamarack unit	INDU
	The report indicates the results of a search and mapping effort for rare plants within the Indiana Dunes National Lakeshore. Lists of rare plants known or reported from the study area are included, and rare plant species were mapped on topographical sheets. Remarks and recommendations are provided for each area studied, and plant species found.			
123	Plampin, Barbara, Newgent, Myrna, Miramontes, Lydia	2003	Evaluation of rare plants at Indiana Dunes National Lakeshore: Tamarack unit, Area C: summer 2002-summer 2003	INDU
	A survey was conducted at the Tamarack Unit, Area C, Indiana Dunes National Lakeshore to map rare plant species, count the number of individuals at each location, and evaluate the status of the species by comparing current abundances with those originally determined in 1992 and 1993.			
124	Plampin, Barbara E., O'Brien, Sandra	2001	Calumet bike trail flora of concern	INDU
	Rare plants were surveyed along the Calumet Bike Trail, part of which runs past Indiana Dunes National Lakeshore. The data was used to aid in the construction of the bike trail.			
125	Poulson, Thomas L.	1999	Autogenic, allogenic, and individualistic mechanisms of dune succession at Miller, Indiana; Natural Areas Journal	INDU
	The article describes the successional stages of the sand dunes north of Miller, Indiana by studying vegetation change and relationships among plants.			
126	Rabeler, Richard K.	2002	Noteworthy collection; Michigan Botanist	PIRO
	The distribution of a federally listed, noxious weed, Giant cow parsnip (*Heracleum mantegazzianum*) in Michigan is discussed. The species has been documented from the Lower Peninsula as well as in the Ironwood area of the Upper Peninsula.			
127	Ray, Gary	1988	Pinhook Bog restoration project 1987: data summary and progress report	INDU
	Thr report summarizes the restoration efforts at Pinhook Bog in the Indiana Dunes National Lakeshore after its contamination from road salt runoff. The overall approach to the project is described, followed by descriptions of methods for water chemistry sampling, plot design and sampling, site preparation, and transplantation of native species. Data tables show bog sample temperatures, conductivity of peat water, pH, alkalinity, chloride concentrations, and mean cover percentages for monitoring plots before and after the bog restoration. Additional information includes a summary of follow-up cattail removal projects and a map of study plot and transplant locations.			
128	Read, Robert H.	1974	Vascular plants of Pictured Rocks National Lakeshore (with identification of botanically outstanding areas in park)	PIRO
	Names of 569 species of vascular plants of Pictured Rocks National Lakeshore, MI are catalogued alphabetically by family name with brief notes on habitat for each. A separate, alphabetical list of common names of plants provides a reference for the scientific names. The introduction addresses major and noteworthy minor vegetation types of Pictured Rocks National Lakeshore and provides tables which list representative species of deciduous woods, pine woods and barrens, wet woods, and beach strand and dunes. The significance of disjunct western plant species, boreal species, and beach species is discussed.			

129	Read, Robert H.	1975	Vascular plants of Pictured Rocks National Lakeshore, Alger County, Michigan; Michigan Botanist	PIRO
	Names of 569 species of vascular plants of Pictured Rocks National Lakeshore, MI are catalogued alphabetically by family name with brief notes on habitat for each. A separate, alphabetical list of common names of plants provides a reference for the scientific names. The introduction addresses major and noteworthy minor vegetation types of Pictured Rocks National Lakeshore and provides tables which list representative species of deciduous woods, pine woods and barrens, wet woods, and beach strand and dunes. The significance of disjunct western plant species, boreal species, and beach species is discussed. History of botanical exploration in the Pictured Rocks area is provided.			
130	Read, Robert H., Paddock, Mark W.	1975	Vascular plants of Pictured Rocks National Lakeshore; Natural history surveys of Pictured Rocks National Lakeshore and Sleeping Bear Dunes National Lakeshore	PIRO
	The names of 569 species of vascular plants of Pictured Rocks National Lakeshore, MI are catalogued alphabetically by family name with brief notes on habitat for each. A separate, alphabetical list of common names of plants provides a reference for the scientific names. The introduction addresses major and noteworthy minor vegetation types of Pictured Rocks National Lakeshore and provides tables which list representative species of deciduous woods, pine woods and barrens, wet woods, and beach strand and dunes. The significance of disjunct western plant species, boreal species, and beach species is discussed.			
131	Richardson, James W.	no date	Preliminary survey of plant communities and endangered species of the Saint Croix National Scenic Riverway	SACN
	The survey includes an annotated community list and checklist of plant species noted in along the St. Croix River.			
132	Rosenwinkel, E. R.	1967	Temperatures over tundra plants, summer, 1967	ISRO
	Air temperatures are one of the major correlative and casual factors in the general distribution of tundra plants. Air temperatures were taken in July and August of 1967 on the lake-exposed rock shores of Scoville Point on Isle Royale over tundra plants and in adjacent forests to compare to summer temperatures of arctic, alpine, and adjacent non-tundra areas. Formulae derived values showed that the climate of Scoville Point and probably Blake Point are not of tundra or even of timberline, but are closer to that of northern boreal, or taiga.			
133	Sanchini, Paula J.	1987	Incidence and spatial pattern of trees with necrotic needle symptoms in *Pinus strobus* populations of nine National Parks in 1987: draft final report	GRPO PIRO SLBE
	In 1987 a study to determine the cause of white pine needle blight in Acadia National Park was initiated. Trees with this complex show symptoms such as needle tip necrosis, chlorosis of needles, production of short needles and premature shedding of fascicles. These symptoms are observed appear before the pathogen is evident. The causes of these injuries can be from a variety of sources including needle feeding insects, needle fungi, semi-mature needle tissue blight, sulfur dioxide, and ozone. Unfortunately, it is very hard to differentiate these causes once the development of the symptom complex is complete. In order to provide insight into the epidemiology of the problem, studies of the spatial patterns of trees exhibiting the symptoms of white pine needle blight in other National Parks were undertaken. This report primarily provides extensive details of the research conducted in Acadia National Park, but it also presents data from the other parks surveyed for comparison. Grand Portage was among the other park units studied and in fact showed the highest incidence of all the parks including Acadia.			
134	Schultz, Janet L.	1988	Inventory of several rare plant species within the Grand Sable Dunes area of the Pictured Rocks National Lakeshore	PIRO
	Permanent quadrats/transects were established for some plant species in the Grand Sable Dunes of Pictured Rocks National Lakeshore, Michigan. Percent cover, relative frequency, relative dominance, importance value, and over story data are presented as applicable. Management prescriptions and suggestions for further research are given.			
135	Schultz, Janet L.	1989	Sand Point marsh trail, Pictured Rocks National Lakeshore, T47N, R18W, Section 19, Alger Co, Michigan, botanical survey	PIRO
	Plant communities in the area of the marsh (beaver ponds) at Sand Point, Pictured Rocks National Lakeshore, Michigan are described. The Michigan Natural Features Inventory (MNFI) classification system was used. Identification of vascular plants was made during 5 visits to Sand Point Marsh Trail from late May to early August 1989. A checklist of 75 plant species and map are provided. Interpretive suggestions for the marsh trail are given. No Michigan threatened, endangered, or special concern plants were found from the survey.			

136	Slavick, Allison D.	1983	Vascular plants of Isle Royale National Park, Michigan	ISRO
	This report is part of the end result of a five year project entitled "The Flora and Vegetational Ecology of Isle Royale National Park," funded by the NPS. The text of this report reviews botanical exploration on the island and discusses major plant communities. The accompanying catalogue contains all of the vascular plants found on Isle Royale, each of which has been verified by a herbarium specimen. For each plant, a short description of habitat preference and abundance within the park is given, along with the common name. One hundred and fifty new species have been added since Clair Brown published his catalog in 1935.			
137	Slavick, Allison D., Janke, Robert A.	1987	The flora of Isle Royale National Park; Michigan Botanist	ISRO
	The text reviews botanical exploration on Isle Royale and discusses major plant communities. The accompanying annotated catalogue contains all of the vascular plants found on Isle Royale, each of which is supported by one or more verified herbarium specimens.			
138	Slavick, Allison D., Janke, Robert A.	1993	The vascular flora of Isle Royale National Park, 3rd edition	ISRO
	The text of this booklet reviews botanical exploration on Isle Royale and discusses major plant communities. The accompanying annotated catalogue contains all of the vascular plants found on Isle Royale, each of which is supported by one or more verified herbarium specimens.			
139	Smith, Michael, Faber-Langendoen, Don	1998	Voyageurs National Park: plant species of concern, plant communities of interest	VOYA
	Description of the plants found in Voyageurs National Park that are listed as endangered, threatened, tracked, or special concern in the state of Minnesota.			
140	St. Croix National Scenic Riverway	1987	Pesticide program	SACN
	This file contains the since outdated plans and policies concerning the use of chemical pesticides (herbicides) in National Park Service units. Guidelines, request forms and report analysis are furnished, especially as they relate to the St. Croix Riverway. Along with information on the Program are use logs and product information.			
141	St. Croix National Scenic Riverway	1996	Species list: plants	MISS, SACN
	This is a collection of checklists of plant species found along the riverway. The list groups plant species by the entire Riverway and by district. There is information on a herbarium, a paper on Riverway trees and shrubs, a report on plants found and their Riverway locations, and a description of the St. Croix's Riverways ecological regions.			
142	Steigerwald, Ed	1973	Vegetation cover type map - Voyageurs National Park	VOYA
	Vegetation cover type map of area now Voyageurs National Park, depicts 15 cover types with 3 categories of stems, cords, and board feet per acre.			
143	Stubbendieck, James, Willson, Gary	1986	Indiana Dunes National Lakeshore: Indiana; an identification of prairie in National Park units in the Great Plains; occasional paper	INDU
	The section describes the prairie communities found at Indiana Dunes National Lakeshore.			
144	Stubbendieck, James, Willson, Gary	1986	Saint Croix National Scenic Riverway: Minnesota-Wisconsin; an identification of prairie in National Park units in the Great Plains; occasional paper	SACN
	The section describes the prairie communities at Saint Croix National Scenic River.			
145	Sudbrock, Andy	1999	The River Gorge savanna: restoring a rare plant community	MISS
	Restoration of a mesic oak savanna, location T28N R23W SWSW Section 5.			

146	Swain, Albert M.	1986	Hemlock, pine and white cedar reproduction on the Apostle Islands National Lakeshore	APIS
	This study surveyed the present regeneration of pine, hemlock, and cedar in Apostle Islands NL. Objectives of the study included: locating remnant stands of white pine, hemlock and white cedar that could serve as seed sources for new reproduction; documenting the extent of pine, hemlock, and cedar reproduction in existing stands and adjacent to remnant stands; examining the age structure of remnant stands of pine, hemlock and cedar and of any reproduction in or near the remnant stands; recommending specific procedures for regenerating and managing pine, hemlock and cedar forests; and setting up test plots for evaluating recommended regeneration techniques.			
147	Tonkovich, Gayle S.	2003	A survey of the emergent vascular plant species in wetlands of the Miller unit of the Indiana Dunes National Lakeshore, 2002-2003	INDU
	A two-year inventory of emergent vascular plants was conducted in the Miller Unit of Indiana Dunes National Lakeshore. Twenty-eight ponds in the unit were surveyed by walking the perimeter and wading into inundated areas.			
148	U.S. Department of Interior, National Park Service, Air Quality Division	1986	Milkweed survey III, air quality division, National Park Service	PIRO
	Data concerning damage to milkweed (Asclepias) leaves caused by ozone were collected on August 25, 1986, on the Grand Sable Dunes and along Carmody Road at Pictured Rocks National Lakeshore, MI. Data about height, number of leaves, number of leaves injured by ozone concentrations, and number of seed pods were recorded for each of 20 milkweed plants. Soil moisture was also noted.			
149	Voss, E. G.	1967	The status of some reports of vascular plants from Michigan; The Michigan Botanist	ISRO
	no abstract available			
150	Wagner, W.H., Jr., Wagner, F.S.	1990	Moonwarts (*Botrychium subg Botrychium*) of the upper Great Lakes Region, USA and Canada, with descriptions of two new species; contributions from the University of Michigan Herbarium	PIRO, SLBE
	The article describes the *Botrychium* species found in the upper Great Lakes Region with a discussion on the difficulty of finding and identifying them.			
151	Wagner, W. H., Voss, E. G., Beaman, J. H., Bourdo, E. A., Case, Frederick W. Jr., Churchill, J. A., Thompson, P. W.	1977	Endangered, threatened, and rare vascular plants in Michigan; Michigan Botanist	ISRO
	no abstract available			
152	Waterman, Warren, G.	1922	Development of plant communities of a Sand Ridge region in Michigan; The Botanical Gazzette	SLBE
	Through a literature search, the author discusses the implications geology, geography, and sand ridge formation have on the formation of plant communities and successional stages in the Platte River area of Sleeping Bear Dunes National Lakeshore. Two successions (seres) are defined in the article: sand succession (psammosere) and water succession (hydrosere). There is a map showing vegetation types and physical features of the Platte River area.			
153	Whisler, Sandra L., Pavlovic, Noel B.	1992	Plan for seed collection and plant propagation at INDU	INDU
	The report offers recommendations for homesite restoration protocols. Topics of discussion include obtaining local genotypes for seed, using volunteers for seed collection and other activities, plant propagation, organization, nursery development, funding needs, drawbacks to some actions, and alternatives for management of the restoration project. A proposed timetable for the major seed collection program is included.			
154	Wilcox, Douglas, A.	1982	Report on survey of two bogs in Sleeping Bear Dunes National Lakeshore	SLBE
	A description of two unnamed bogs within the authorized boundary of Sleeping Bear Dunes National Lakeshore, Michigan. There are representative species lists of the prominent plant species observed at each bog. The specific conductance of the waters was measured, sphagnum moss samples were collected and identified, and general observations were made about the bogs.			

155	Wilhelm, Gerould S.	1990	Special vegetation of the Indiana Dunes National Lakeshore	INDU
	In 1979, plants were surveyed at Indiana Dunes National Lakeshore to determine which species were floristically significant to the environment of the park. Natural Areas were also identified. Since that time, additional plant species were identified and acreage was added to the park. The report attempts to expand on the findings of the 1979 data and incorporate newer data. Impacts of postsettlement conditions are also discussed.			
156	Young, Fredrick H., III	1991	Fred Young's phenology observations	PIRO
	Observations of annual sightings (phenology) of first leaf emergence and flowering of several plants found in Alger County, MI and Pictured Rocks National Lakeshore, MI are recorded in chart form from 1973-1991. The plants include pink ladyslipper, ramshead ladyslipper, calypso orchid, yellow ladyslipper, white trillium, red trillium, wood leek, marsh marigold, apple, hazelnut, red-berried elder, trailing arbutus, spring beauty, red maple, trout lily, dutchman's breeches, squirrel corn, pin cherry, serviceberry, hepatica, red maple, aspen leaves, bloodroot, yellow violet, purple violet, Canada violet, and lilac. From 1973-1987 observations were made concerning ice out of South Bay of Lake Superior, snow melt in woods, snow melt in Munising, spring peepers heard, wood frogs heard, mourning cloak butterfly observed, first robin observed, trout run, smelt run, and last frost.			