

WORKSHOP SUMMARY

Conceptual Model Development Workshop

For

John Muir National Historic Site

Eugene O'Neill National Historic Site

This document is a summary of a one-day workshop held on August 5, 2002. The goal of the workshop was to create a conceptual model for John Muir National Historic Site (JOMU) and Eugene O'Neill National Historic Site (EUON) in order to help us to identify indicators and why we select them for vital signs monitoring. Knowledge regarding the significant natural resources in and adjacent to the park that were determined at the Vital Signs Scoping Workshop in January 2002, were revisited (Appendix A).

The Vital Signs Scoping Workshop:

1. Identified the natural resource base, significant natural resources and processes for the two parks,
2. Identified current threats and stresses that affect those natural resources, and
3. Recommended potential vital signs indicators for long-term monitoring that would capture changes in the significant natural resources.

The goal of this Conceptual Model Development Workshop:

1. Development of a conceptual model and assumptions about the ecosystems
2. Review/prioritize vital signs indicators and develop monitoring goals.

The conceptual model developed for each park will be incorporated in a San Francisco Bay Network conceptual model for large-scale, network-wide ecosystem function and management. The conceptual models for each park grouping are specific to the local environment and represent important resources and indicators that may be relevant only to those particular parks. The JOMU and EUON conceptual model is combined due to close proximity of the two parks, relatively similar ecosystems and threats, and combined management of the parks.

Nine participants took place in the workshop facilitated by Jennifer Bjork, the Network Coordinator (Appendix A). This summary was developed by Susan O'Neil, Network Biological Technician.

Why use a conceptual model?

To help us identify indicators for vital signs monitoring and reasons for selecting them.

How will this be accomplished?

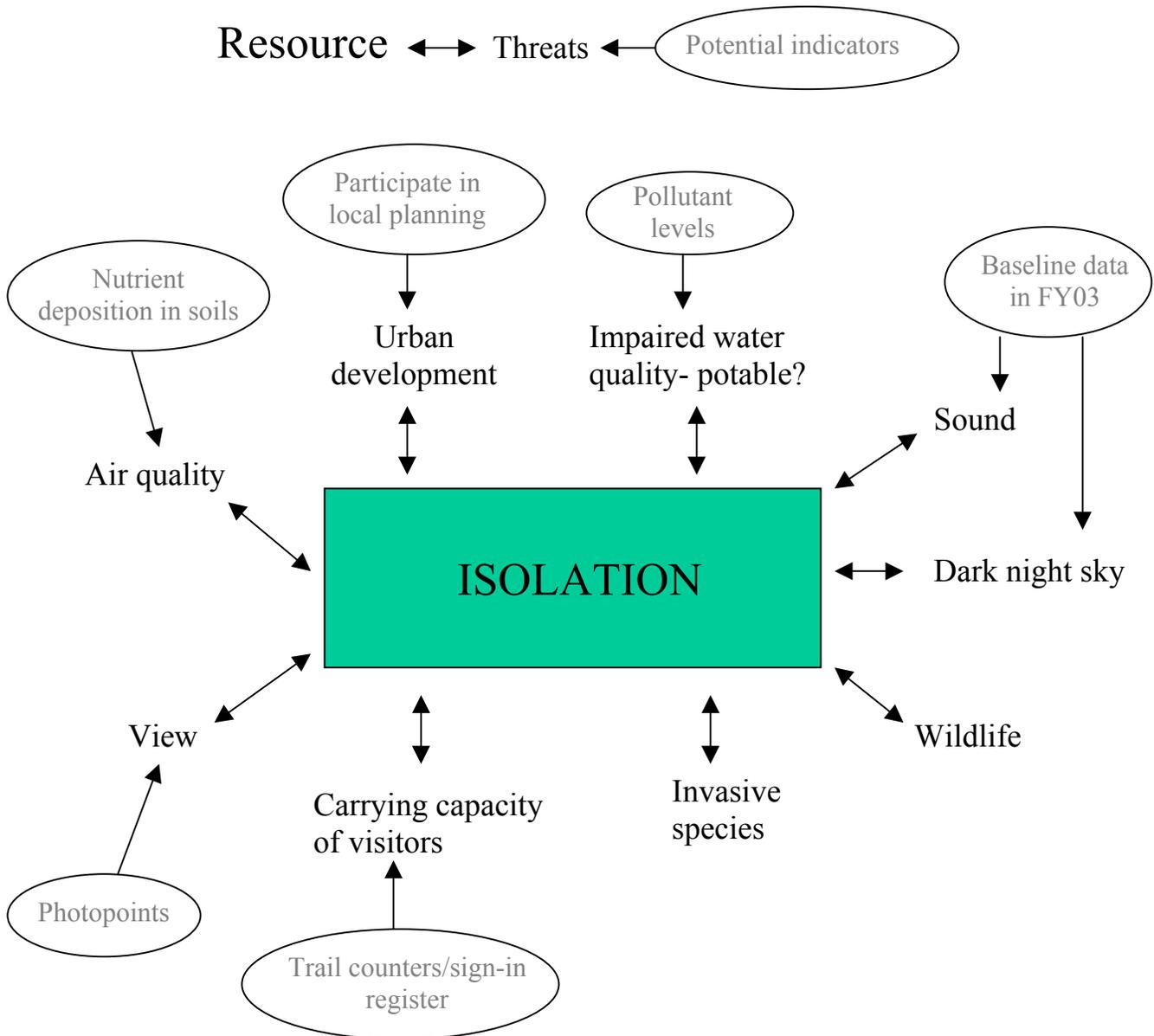
Use previous workshop information and draft conceptual models. Fit JOMU/EUON into those models or adjust them to fit park resources.

Workshop Process:

1. Review knowledge and assumptions and make sure they are correct,
2. Review significant resources from past workshop,
3. Review stressors (what affects the resource),
4. Determine the effect of the stressors and what vital sign ecological indicators we can use to monitor the effect.

The group concentrated on five significant resources for the two parks. They brainstormed all threats to the resource and selected some potential indicators. The significant resources were a feeling of isolation, wildlife habitat, wildlife, species of special concern, and viewshed into park. What follows is a summary of the group's findings for each resource. Three are represented visually, as they were conceived during the meeting. The significant resources wildlife and species of special concern are presented in table form because they were not as well developed for visual representation. Following the summaries of each resource are lists of gaps in knowledge as well as mitigation/potential management actions that became apparent during the brainstorming process.

1. ISOLATION



1. ISOLATION:

Suggestions for mitigation/management:

- ❑ At JOMU, the fireroad going up from the Strain Ranch should be converted to a trail.
- ❑ Superintendent should be involved in planning and development around parks that may affect resources. Documentation and a record of participation should be kept.
- ❑ Maintain connectivity to other open spaces (physically and managerially).
- ❑ Develop interpretive waysides, especially a geologic map.
- ❑ Attempt to maintain a buffer (i.e. woodlands) around the park through involvement in neighborhood association and East Bay Regional Parks.

- ❑ Remove all major invasive plants.
- ❑ Include some mechanism to interpret the JOMU house site during off-hours, i.e. a platform to view his house, wayside for Mt. Wanda access.
- ❑ Eliminate septic system at JOMU.
- ❑ Provide interpretive meteor shower and other dark night sky events to educate public.

Examples of indicator selection for this resource-

Indicator: Aesthetics (sound, view, and dark night sky).

Why is it selected: These are ethereal senses that affect the feeling of isolation.

Sensitive attribute of indicator:

Sound- decibel level, type and frequency

Light pollution – location, intensity

View- distances and objects seen

Management objective: Develop baseline data for later use in decision making.

Management response: Become involved in planning of nearby areas, and evaluate baselines and determine future protocol.

Indicator: Nutrient deposition in soils.

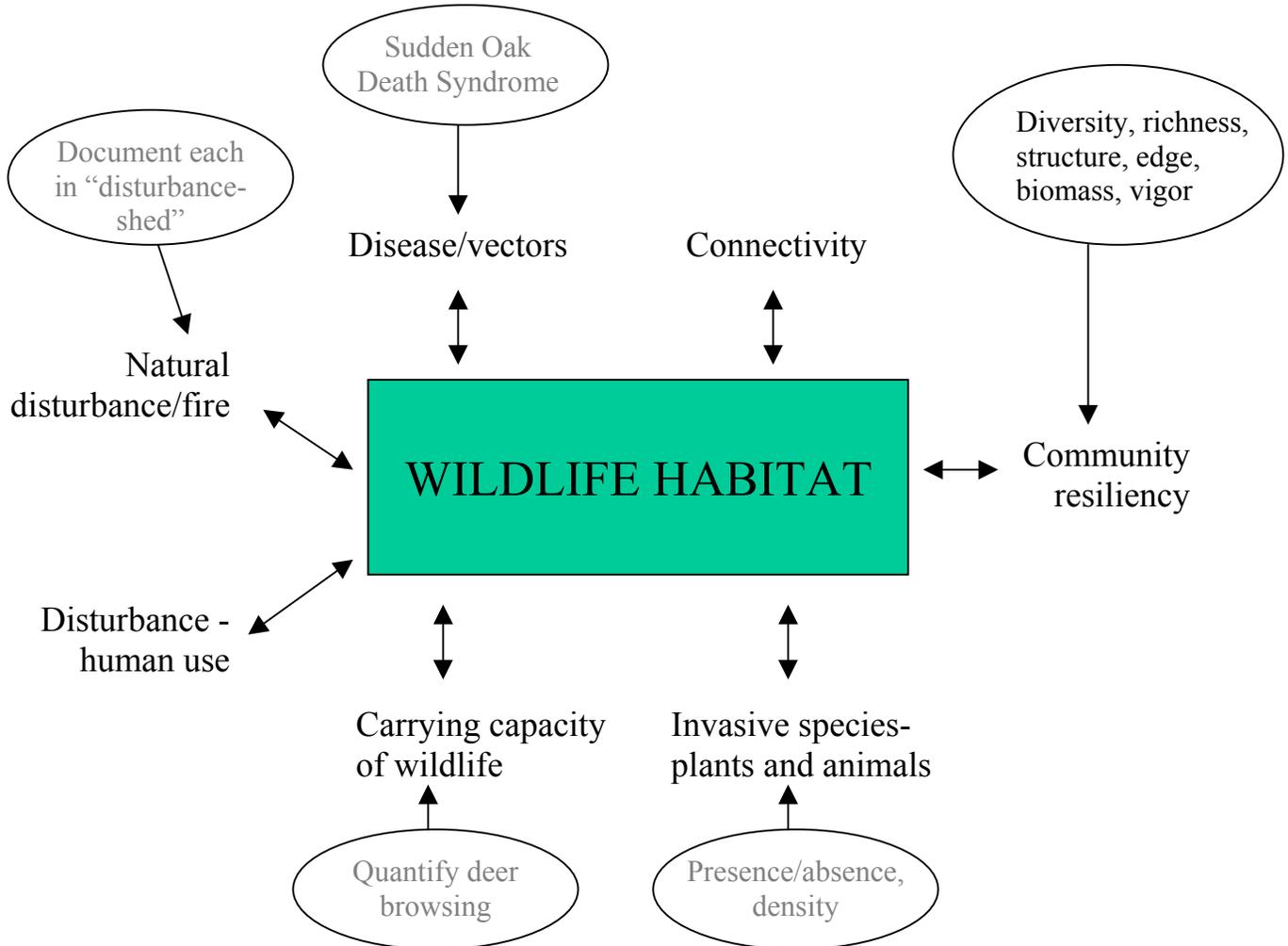
Why is it selected: Nutrient flow, invasibility, air pollution deposition, water quality, health of ecosystem.

Sensitive attribute of indicator: Concentration

Management objective: Understand until we have a baseline and then reconsider (decrease?) Will only work if monitored as a network

Management response: Education (present info to air quality board)

2. WILDLIFE HABITAT:



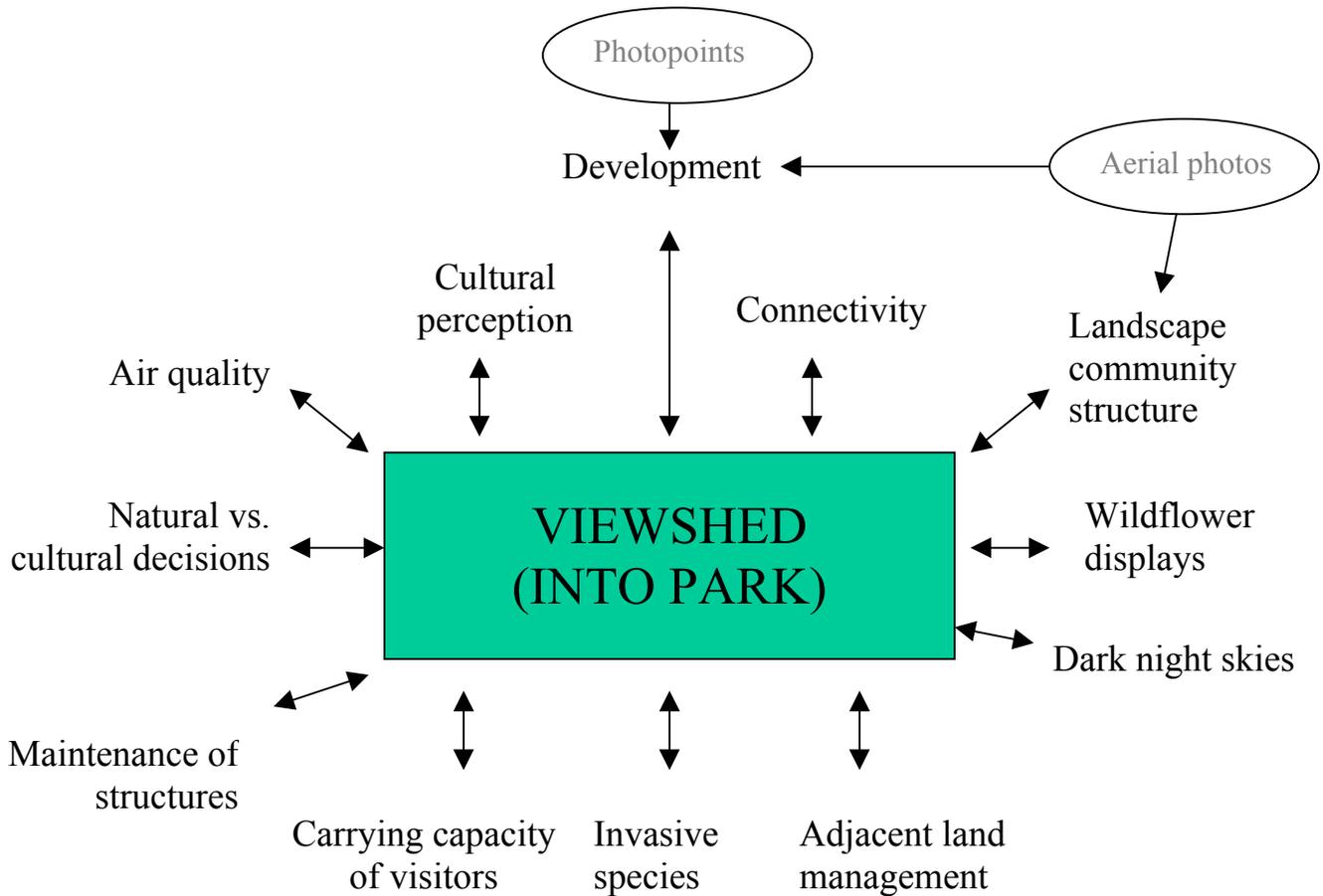
Research needed for wildlife habitat:

- ❑ Determine the historical vegetation communities present on Mt. Wanda and the potential for native grassland communities.
- ❑ Research corridor needs for wildlife and plants.
- ❑ Determine natural disturbance regimes.
- ❑ Determine natural oak regeneration – started summer 2002.
- ❑ Artificial pond at EUON should be studied as a source for bullfrogs, algal blooms, habitat potential, etc.

Suggestions for mitigation:

- ❑ Remove 12 most invasive plant species (Appendix A).
- ❑ Take appropriate measures to prevent the spread of disease.
- ❑ Use local seed/seedling sources for restoration.
- ❑ Work with outside planning groups (for buffer and connectivity) and internal NPS resources to manage the area holistically
- ❑ Obtain a vegetation map (utilize CNPS, WHR, park teams).

3. VIEWSHED INTO PARK



Research needs:

- ❑ Develop landscape maps during periods of Muir and O’Neill. Compare and assess what is left or has changed (done for EUON)
- ❑ Review by a cultural landscape expert
- ❑ Define pastoral scene

Suggestions:

- ❑ Treat Mt. Wanda and Port Chicago as both natural and cultural.

4. WILDLIFE (large and medium sized vertebrates)

Threats:

Disease
Parasitism
Predation
Quality and quantity of habitat
Population viability/genetic stability
Poaching
Invasive species
Ingestion of toxins

Potential indicators:

Trailmaster camera

Research needed:

- Conduct an invertebrate inventory.
- Determine natural level of variation for population sizes.
- Gary Feller's report on vertebrates at JOMU and EUON (subject will be revisited for indicators following his report) is needed before further indicator selection.
- Presence of feral cats, ground squirrels (Mt. Wanda), red fox (EUON)

Suggestions:

- Use 30 years of bird data gathered from Mt Wanda

5. SPECIES OF SPECIAL CONCERN (Rare and invasive species)

Threats:

Inter-annual climate
Global climate
Microclimate
Herbivory
Disease
Competition from non-natives
Disturbance
Competition from natives
Soil
Population size/structure
Land management
Poaching/collecting
Parasites
Change in community structure or composition

Potential indicators:

Sudden Oak Death

Nutrient levels

Mortality/recruitment

List of species of special concern:

- Invasive plants (especially the 12 plant species noted in previous workshop) and animals (starlings, feral cats, etc.)
- Helianthella castanea* (JOMU)
- All oak species
- Salvia mellifera* (JOMU)- northernmost range for black sage
- Helianthemum scoparium*
- Asclepius cordifolia*- southernmost populations (2 plants on Mt. Wanda)
- Amphibians

Research needed:

- Research stressors and impacts to each species

Examples of indicator selection for this resource-

Indicator: Disease- *Phytophthora ramorum*

Why is it selected: Protocol already described, tie into larger project, know condition of a significant natural resource (oak woodland), potential large ecosystem-wide impacts.

Sensitive attribute of indicator: Magnitude and location of affected trees. Look at pattern for potential natural resistance, signs of symptoms.

Management objective: Maintain or improve the oak woodland

Management response: Cache acorns for future use. If present, determine vectors and follow procedures, improve prevention of transmission. Update as more is known.

Indicator: Mortality/recruitment

Why is it selected: Easy for management to understand and quantify whether populations are increasing/decreasing, strength, health and vulnerability.

Sensitive attribute of indicator: presence/absence, number of individuals, aerial extent, and presence of seedlings.

Management objective: Maintain or increase rare species, decrease invasive species

Management response: For rare species, if population drops below current size start research, reintroduce, consult external databases. For invasive species, if there is an increase that should trigger research and an increase in control efforts.

Suggestions for a conceptual model for the EUON/JOMU ecosystems

Separate categories based on geo-physical, biological and cultural.

Incorporate water quality, soils, channel shape and change, disturbance regimes, mass wasting.

Appendix A

Vital Signs Scoping Workshop, January 22-24, 2002

John Muir National Historic Site

Significant natural resources - desired future conditions (in alphabetical order)

1. Floodplain terrace (Strain ranch area)
Desired future condition: The ideal future condition is to have a functional floodplain with related values such as sediment retention, but safety and acting as a “good neighbor” may modify this condition.
Actions: Consider restoration of the Strain flats to a wetland.
2. Grassland (Mt. Wanda peak area)
Desired future condition: Encourage more diversity and percent cover of native grasses and herbs.
Actions: Keep invasive exotic plants out.
It may not be feasible to develop native grassland. Constant disturbance will be required to maintain it. There was much discussion about how to create the disturbance (fire, mowing, grazing). The California ground squirrel used to be a major grazer. Should it be reintroduced here? The NPS does use short-term disturbance to restore an area, but it would be unusual to use long-term manipulated disturbance to maintain an area. There was also much discussion about whether this area had been shrubland or grassland in prehistoric times. If the area became a chaparral shrubland, fire protection would become a major park activity. A soil survey was encouraged to help answer the question of what vegetation type was desirable. In the meantime, maintaining the native grassland seemed appropriate.
3. Muir meadow (off Alhambra Rd.)
Desired future condition: Unknown without further research on the appropriateness of combining oak woodland/grass restoration. There were more native grasses here than on the Mt. Wanda peak area.
 1. Migratory corridors
Desired future condition: Create and maintain migratory corridors and linkages to allow for healthy migratory populations.
Particular species of concern: coyote, grey fox, mountain lion, bobcat, raptors, owls.
Actions: Link the park with existing open space including the Sky Ranch, Almond property and Briones.
 2. Oak woodland
Desired future condition: Maintain a healthy community at the current size; restore the fire road along “no name” creek to a hiking trail
Actions: Control noxious invasive plants. Encourage regeneration and, if necessary, develop a planting program to replace oaks that die. Treat the “no name” creek as an oak woodland, since it has a species composition closer to that community and since the creek bed is intermittent and dry most of the year. Could wildland fire fighting access be through the Almond property instead of up the creek? Then the park could restore the road to a hiking trail and reduce sediment erosion. The “no name” creek woodland is currently the most diverse in the park, provides important bird habitat, shade for visitors, and has the qualities of dark night sky and natural sound. The

stock pond upstream of the fork in the creek bed is 90% full of sediment. The head cut above it is not stable. It needs to be reconfigured to slow erosion possibly using a natural stepped system.

3. Pastoral cultural scene

Pastoral means of or pertaining to the countryside. The pastoral scene includes the orchards by the Muir House, the gravesite and orchards, the agricultural areas, and the ornamentals planted by the Muirs.

Desired future condition: A mosaic of historical, rural, pastoral and wild landscape that is quiet, clean and has dark night skies.

Actions: See actions under Viewshed.

4. Riparian corridors and wetlands

Desired future conditions: Healthy, functional riparian corridors and wetlands

Actions: Control noxious invasive plants.

A possible restoration site is the Strain floodplain terrace using willows and other wetland plants developing a more sinuous stream corridor. It was thought that it is not appropriate to develop retention ponds and wetlands upstream in “no name” creek. A second potential restoration site is at Franklin Creek to develop a more natural riparian corridor.

5. Special status species

Desired future condition: Maintain and enhance species populations and habitat.

Actions: Actively remove invasive non-native plants in and adjacent to these habitats.

6. Top-level predators

Desired future condition: Maintain habitat for top-level predators such as bobcats, raptors and owls.

Actions: Maintain connectivity with other adjacent, large natural areas. Except for a few roads/transportation corridors that create barriers, there is a natural connection north to the Carquinez Straits or south following the creek beds.

7. Viewshed

Desired future conditions: Good air quality, natural sounds and quiet, dark night sky, limited man-made structures.

Actions: This will take a partnership with city and county land use planners. It is important to limit ridge-top development for all views from the park.

Important views:

a) Upper Mt. Wanda views to the S-SW to the N-NW. These views currently have a limited amount of development. This viewshed is critical to maintain desired future condition.

b) Refinery and delta. Important to maintain clean air quality. Desired goal is to see the Sierra's.

c) Grassland. Define the historical condition of the grasslands and determine if they are appropriate. If they are, it is appropriate to manage as a wildland, native grassland.

d) Train trestle to Muir Station. Ridgetops are currently unbuilt.

e) Views into and of the park. The fire roads are an intrusion to these views.

8. Watershed

Desired future condition: Maintain it in a healthy state.

Actions: Adopt the Alhambra Creek Watershed management goals if they do not oppose any park guiding principles.

Known stresses:

| | Natural | Human-influenced |
|----------------------------------|---------|------------------|
| ➤ External land use | | X |
| ➤ Landslides/erosion | X | X |
| ➤ Non-native invasive plants | | X |
| ➤ Deep thatch in grassland | | |
| ➤ Wildland fire | X | X |
| ➤ Disease | X | X |
| ➤ Toxins/pollutants (air, water) | | X |

Vital signs monitoring indicators

All monitoring mentioned was felt to be necessary, but it was recognized that funding and manpower constraints would limit the park’s ability to do all of the monitoring immediately. A voting exercise was used to recommend the sequence of initiating the monitoring.

Highest priority = start this year, if possible (ranked 6 to 9)

- ❑ **invasive non-native plants** as an indicator of native plant community health. Map distribution and assess relative abundance of current populations for the baseline. Revisit, map and assess on a regular basis (frequency to be determined). Visit potential areas of introduction to document the presence of the non-native plants and record new introductions. Obtain historic records of control actions and keep current records to determine effectiveness of control actions. Monitor along vectors. The following invasive plants are of primary concern. Most have a clumped distribution, so should be easier to monitor and control*:
 1. *Ailanthus altissima* (tree of heaven)
 2. *Centaurea solstitialis* (yellow-star thistle)
 3. *Cynara cardunculus* (artichoke thistle)
 4. *Lepidium latifolium* (pepperweed, tall white top)
 5. *Euphorbia oblongata* (oblong spurge)
 6. *Centaurea calcitrapa* (purple star thistle)
 7. *Arundo donax* (giant reed)
 8. *Vinca major* (periwinkle)
 9. *Rabinius pseudoacacia* (black locust)
 10. *Foeniculum vulgare* (fennel)*
 11. *Genista monspessulana* (French broom)*
 12. *Conium maculatum* (poison hemlock)*

* In reviewing from first workshop, NPS staff would like a new list of species considered with lesser focus on those species with an asterisk and including the following: Harding grass, bull thistle, Italian thistle, *Cotoneaster* sp.

- **connectivity and top-level predators** as an indicator of community health. The most important aspect is to identify, maintain and monitor the migratory corridors themselves. Aerial photos could be used for this monitoring. Partnerships with large adjacent landholders such as the Almond property, Sky Ranch and Briones are important. Top level predators include:
 - a) coyote
 - b) mountain lion
 - c) bobcat
 - d) grey fox
 - e) raptors (September migrant VIP event, nest cavity searches, spring counts)
 - f) owls

Medium priority = start soon (ranked 2 to 4)

- **Native plants** (percent cover, richness and diversity). Inventory transects were established and surveyed in 1992. These could be used as the baseline and repeated every ten years. Black oaks may be a rare component of the woodland and deserve greater attention.
- **Deer** (charismatic, large mega-fauna). They browse woody vegetation and eat large amounts of acorns in the fall. Monitoring could be via habitat monitoring including mast production baskets and browse line surveys.
- **Ticks, lizards and disease**. Lizards are a dead-end vector for Lymes disease. Yearly collection of ticks and analysis for disease will allow the park to know and share information about the likelihood of getting the disease in the park. Monitor lizard population trends.
- **Water quality**. Identify and evaluate current data from other organizations such as the Central Sanitation (Alhambra Creek) and Contra-Costa County Water District (Delta intake). Select monitoring indicators. Aquatic invertebrates in Franklin Creek could be monitored. Monitor debris in Franklin Creek.

Lower priority = start when possible (1 vote)

- Air quality
 - through County monitoring of EPA criteria pollutants
 - visibility
 - deposition
 - grapes for ozone
 - lichens for sulphur
- Amphibians as a sensitive indicator of air pollution
- Birds (September migrants, nesting)
- Dark night sky
- Deposition of nitrates, sulfates, heavy metals and POP's.
- Natural soundscape

- ❑ Small mammals such as the California ground squirrel (creates disturbance in grassland communities) and the Botta pocket gopher as an indicator of grassland community health
- ❑ Terrestrial invertebrates
- ❑ Visibility monitoring
- ❑ Weather – micro-climates

Remaining Significant Natural Resources (in alphabetical order)

1. Feeling of isolation
2. Grassland strip below the Tao House
3. Oak woodland/riparian edge community
4. Migratory corridor
5. Species of special concern
6. Springs (one feeding the stock pond and the second, the water towers)
7. Wildlife habitat
8. Viewshed

Desired future conditions were not developed for each of these resources, but are still needed.

Known Stresses to the Significant Natural Resources:

| | Natural | Human-influenced |
|----------------------------------|---------|------------------|
| ➤ Disease | | |
| ➤ Erosion and mass wasting | X | X |
| ➤ External land use | | X |
| ➤ Non-native invasive plants | | X |
| ➤ Thatch (grass understory) | | |
| ➤ Toxins/pollutants (air, water) | | X |
| ➤ Wildland fire | X | X |

Potential vital signs monitoring indicators

Highest priority (in rank order)

- ❑ **Native plants** (8) – monitor percent cover and species composition, closely monitor invasive noxious weed distribution (cooperate with East Bay Regional Parks)
- ❑ **Erosion features** (6)
- ❑ **Deer browsing** (6) – effect on cultural landscape and plants. What attracts deer and provides forage?
- ❑ **Surrounding land use** (6) (viewscape, sound, air quality, dark night sky)
- ❑ **Vegetation community level change** (4) (include East Bay parks)

Next priority (all 2's, in alphabetical order)

- ❑ Air quality (through existing regional monitoring stations) and visibility
- ❑ Oak health/sudden oak death

- ❑ Migratory corridor/wildlife habitat
- ❑ Riparian/woodland edge plant community
- ❑ Species of special concern

Others (in alphabetical order)

- ❑ Air pollutant deposition
- ❑ Amphibians
- ❑ Aquifer water quality
- ❑ Birds
- ❑ Surface water quality

Appendix B

Participants:

| | |
|---|---|
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