Biotic Environment

1. **Terrestrial Ecosystem**
   - a. Vegetation Dynamics
     - i. Landscape
       1. *Land cover*
       2. *Forest insect and disease*
       3. *Fire*
     - ii. Community
       1. *Aspen*
       2. *Riparian/riverine*
       3. *Shrub-steppe*
       4. *Alpine*
       5. *Cushion plant*
     - iii. Populations
       1. *Whitebark pine*
       2. *Invasive plants*
   - b. Consumers
     - i. Vertebrate dynamics
       1. Birds
          - a. *Landbirds*
          - b. *Birds of concern*
       2. Amphibians
       3. Mammals
          - a. *Ungulates*
          - b. *Beaver*
          - c. *Large carnivores*
          - d. *Meso-carnivores*
       4. Vertebrate disease
     - ii. Invertebrate dynamics
       1. Insects
   - c. Ground surface and subsurface ecosystems
     - i. Soil structure and stability
     - ii. Soil biota
2. **Aquatic Ecosystem**
   - a. Primary producers
     - i. Algae
   - b. Consumers
     - i. Native aquatic assemblages
     - ii. Exotic aquatic assemblages
     - iii. Aquatic invertebrate assemblages

Physical/ Chemical Environment

1. **Physical climate**
   - a. Climate
   - b. Glaciers
2. **Hydrology**
   - a. Watershed budgets
     - i. *Streamflow*
     - ii. *Ground water quantity*
     - iii. *Arid seep and spring*
     - iv. *Reservoir and lake elevation*
     - v. *Biogeochemical flux*
3. **Water Quality**
   - a. Water chemistry
   - b. Ground water quality
   - c. E.coli (*Escherichia coli)*
   - d. Water temperature
   - e. Stream sediment transport
4. **Geology**
   - a. Geothermal Dynamics
     - i. *Chloride flux*
     - ii. *Geothermal features*
     - iii. *Geothermal water chemistry*
   - b. Seismic activity
5. **Chemical climate**
   - a. Atmospheric deposition
   - b. Oversnow emissions
   - c. Visibility

Human Dimensions

1. **Human Use**
   - a. Visitor use
     - i. *Backcountry day use*
     - ii. *Backcountry overnight use*
   - b. Soundscapes
   - c. Land use

Vital sign names have been modified from Phase II report. Vital signs with protocol work planned or in progress are identified in red