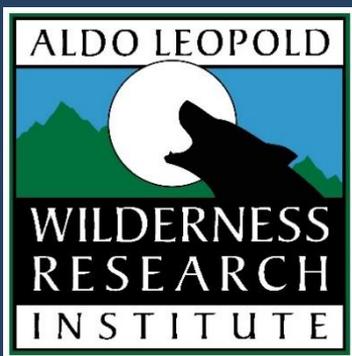


Wilderness Science and Stewardship



A science of land health needs, first of all, a base datum of normality, a picture of how healthy land maintains itself as an organism.

Aldo Leopold, *Wilderness as a Land Laboratory*



Science is essential to wilderness stewardship

Science should inform wilderness stewardship as we learn more about ecological systems, individual species and their habitats, human behavior, and the successes and failures of various policies and management activities.

Science can help us understand the nature of the system for which we are a steward. **Science** can help in learning how to correct human-caused perturbations in such systems. **Science** can help in understanding how systems might be used and enjoyed without destroying them. **Science** can help in understanding how valuable wilderness is to people and how it might enhance their lives.

Ensuring the stewardship of the National Wilderness Preservation System

Pinchot Institute for Conservation 2001

Wilderness Values – Managers and the Public

- **Top wilderness values of wilderness managers:**
 - having wilderness for future generations
 - preserving unique plants and animals
 - contributions to water quality
 - protection of wildlife habitat
 - protection for rare species
- **Top wilderness values of public (NSRE 2008):**
 - contributions to air quality
 - contributions to water quality
 - protection of wildlife habitat
 - having wilderness for future generations

Wilderness Managers Survey - 2014

- **Top threats:**
 - lack of political or financial support
 - invasive species
 - disconnected urban populations
 - adjacent land uses
- **Top research needs:**
 - publicly acceptable climate change interventions
 - stewardship of spiritual values and uses
 - publicly acceptable ecological restoration
 - identification of most important stakeholder values
 - scenic quality protection

Wilderness science informs stewardship decisions...



...from project design to management plans

Wilderness Character

Agencies are legally mandated to preserve wilderness character

Scientists can help managers ...

- establish a baseline assessment of wilderness character for long-term monitoring
- develop a map of threats to wilderness character

Visitor Use and Management

Pressures from wilderness visitors are changing

Scientists can help managers ...

- identify their visitors today and in the future – age, demographics, ...
- document changes in uses and impacts (e.g., overnight vs. day users)
- design a visitor plan
- establish sustainable trails and campsites
- understand how to minimize conflicts

Fish and Wildlife Management

Wildlife management is a persistent challenge

Scientists can help managers ...

- identify climate change impacts to habitat
- describe population variability in relation to habitat change, ecological processes, management actions
- determine effects of disturbance from recreation and visitors

Fire and Other Disturbances

Suppressed and shifting disturbance regimes may pose risks to high value resources

Scientists can help managers ...

- study the causes and effects of disturbances, and to describe disturbance regimes over time
- quantify reference conditions and targets for stewardship
- investigate interactions with the surrounding landscape
- describe historical ranges and variability for evaluating ecosystem resilience, health, and decline

Economic Values

Little is known about market and non-market values of wilderness

Scientists can help managers ...

- Identify the benefits of wilderness land to local, regional, and national economies
- describe the amount and type of jobs related to wilderness
- document the relative value of land and homes near wilderness, and increasing interest in living nearby
- quantify the ecosystem services provided by wilderness (e.g., biodiversity, water, carbon storage)

Water

Wilderness is a critical source of freshwater in the US

Scientists can help managers ...

- understand water supply, quantity, quality, ecosystem services
- investigate hydrologic connections between wilderness and surrounding areas
- inform management responses to fire, insects and diseases
- quantify economic values and benefits
- develop water resource protection strategies

Land Use Change

Land use change is increasingly affecting wilderness resources

Scientists can help managers ...

- assess the impact of land use changes related to energy development
- evaluate effects of air pollution, noise, and light
- study impacts of land use change on water
- document effects on biodiversity, including non-native and invasive species
- quantify changes in visitor use

Climate Change

Climate change is impacting wilderness resources

Scientists can help managers ...

- investigate current and predict future climate change impacts on natural and cultural resources
- provide state-of-knowledge syntheses to inform whether, when, where, and how to intervene
- describe effects on visitor use and management

Cultural Resources

Wilderness hosts abundant archaeological and historic resources

Scientists can help managers ...

- identify and document archeological resources, cultural landscapes, ethnographic resources, and historic and prehistoric structures
- investigate the historical, cultural, social, and spiritual values embedded in wilderness landscapes

Planning

Relevant, timely direction is needed for wilderness stewardship

Scientists can help managers ...

- evaluate ecosystem diversity and representation for proposed and new designations
- draft wilderness stewardship plans
- identify social and economic values and benefits
- manage recreation and visitor use

Other Wilderness Science Needs?

We welcome collaborations with managers at all agency levels!



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<http://leopold.wilderness.net/>