

# Recreation and Wildlife: Integrated Approaches for Monitoring and Management

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## Routt Recreation Roundtable

April 8, 2021 Webinar

Mike Wisdom, PNW Research Station



Jim Ward



Oregon Dept. of Parks and Recreation

# My Background

- Research Wildlife Biologist, PNW Station, FS
  - Involved with recreation research past 20 years.
- Management Biologist for FS and BLM, 1980-2000
  - Recreation-wildlife issues were prominent in all jobs.
  - Frequent interaction with recreation stakeholders.

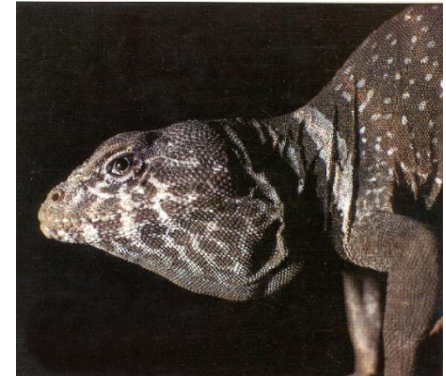


# Presentation

- Recreation effects on wildlife.
- Evaluating effects, identifying tradeoffs and opportunities.
- Management needs.
- Challenges and strategies.



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M. Patrikeev

# Types of Recreation Common on Public Lands

## Traditional, spatially extensive

- Hunting, fishing, trapping.
- Gathering--shed antlers, mushrooms, berries.
- Wildlife viewing/birdwatching.
- Hiking, horseback riding.
- All-terrain vehicle, dirt bike riding.
- Snow machine riding.
- Cross-country, back-country, downhill, heli-skiing.
- Mountain biking.
- Rock climbing
- Boating/Aquatic
- Camping (established sites and dispersed).

# Types of Recreation Common on Public Lands

## More recent, growing rapidly

- Fat tire biking.
- Drone flying.
- Spelunking.
- Ultra-light aircraft flying.
- Para-sail gliding.
- New quad motorized vehicles.
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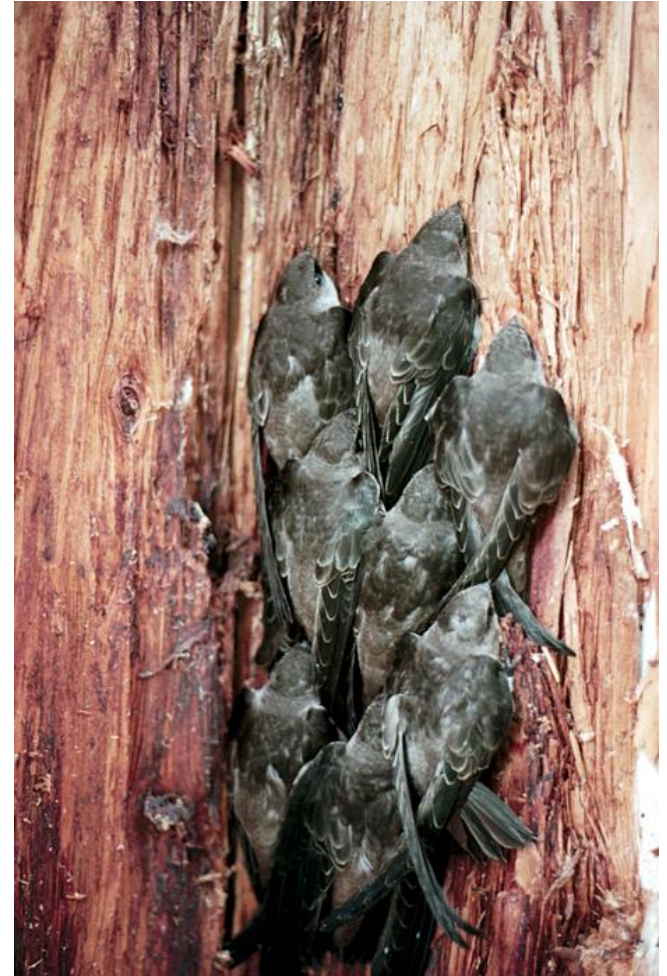


<http://www.playwinterpark.com/fat-biking>



# Recreation Effects on Wildlife

- Diverse, largely negative.
- Motorized and non-motorized equally negative.
- Not obvious, often insidious.
- Direct and indirect.



E. Bull

# Recreation Effects on Wildlife

- All types of vertebrate taxa affected—often species of conservation concern or hunted species.
- Knowledge better for large-bodied vertebrates.
- Often cumulative, chronic, long-lasting.



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W. Leonard



# Recreation Effects on Wildlife

- Social awareness of negative effects can be low, sometimes resulting in strong resistance by recreationists to negative results (“junk science”).



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# Recreation Effects on Wildlife

- Knowledge is substantial but large gaps remain.
- Funding for recreation-wildlife monitoring and research by management agencies remains low.



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# Types of Wildlife Responses to Recreation

- Flight Response/Flight Distance
- Adaptation/Habituation/Resiliency
- Predation Risk Vulnerability
- Security (feeding opportunities foregone)
- Spatial Distribution Shift/Avoidance
- Site Abandonment (nests, colonies, hibernacula)
- Stress/Immune
- Faunal Community (richness, diversity)
- Time Resting, Feeding, Running
- Movement Rate
- Energetic Costs

Fitness: survival, reproduction, population growth

# Major Effects

Behavioral:

--avoidance, landscape shifts in distribution

Physiological:

--increased stress, reduced immunity to disease

Energetic:

--loss of body fat, increased running, less foraging



Reduced Population Fitness and Growth

Functional Extirpation from Landscapes or Ecoregions

# Recreation Effects on Wildlife

- The mere presence of humans can elicit negative behavioral, physiological, and energetic responses by wildlife.
- A variety of sensory cues are used by wildlife to detect and respond to human presence—these cues are not easily identified and evaluated.





# Recreation Effects on Wildlife

- Effects of human presence are magnified by the accompanied presence of dogs, horses, or other domesticated animals, or by mechanized uses (e.g. all-terrain vehicles, mountain bikes).
- Example: walking the ocean beach with an unleashed dog during shorebird nesting or migratory seasons.

**Hennings, L. 2017.** Hiking, mountain biking and equestrian use in natural areas: a recreation ecology literature review. Portland, OR: Portland Metroparks. 130 p.



# Evaluating Effects in Management (NEPA requirements)

- Linear- vs. point-based effects of recreation.



Wisdom et al. 2013. Monitoring human disturbances...In: Rowland and Vojta, editors. A technical guide for monitoring wildlife habitat. Gen. Tech. Rep. WO-80.

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## Chapter 7. Monitoring Human Disturbances for Management of Wildlife Species and Their Habitats

Michael J. Wisdom  
Mary M. Rowland  
Christina D. Vojta  
Michael I. Goldstein

### 7.1 Objectives

Human disturbances dominate national forests and grasslands and affect habitats and species in multifaceted ways. In the past, planning and management efforts focused mainly on the management activities of silviculture, prescribed fire, and livestock grazing. Those disturbances remain as common agents to monitor and evaluate. A variety of additional human disturbances, however, are now prevalent and deserve attention, including roads and traffic, recreation, energy extraction, urban expansion, and nonnative or invasive species. Monitoring and evaluating the most prevalent human disturbances that occur in a given local management unit or ecoregion is needed to meet planning requirements and to assess the diverse effects of such disturbances on wildlife habitats and species.

The goal of this chapter is to provide guidance and methods to select and monitor the primary **human disturbance agents** operating in a given area as part of habitat monitoring for terrestrial habitats of emphasis species. We assigned the following objectives for this chapter.

- Describe the most common human disturbance agents that may affect habitats or species on national forests or other large spatial extents used for Forest Service planning and management.
- Summarize some of the general effects of example disturbance agents on habitats and species with supporting literature.
- Provide criteria and rationale for selecting human disturbance agents to monitor and evaluate.
- Describe methods for monitoring the selected human disturbance agents and for estimating or modeling the assumed effects on habitats and habitat use.
- Provide examples of the monitoring process for human disturbances common to most national forests and grasslands, but that have received less emphasis in traditional monitoring programs.



United States Department of Agriculture

## Sustaining Wildlife With Recreation on Public Lands: A Synthesis of Research Findings, Management Practices, and Research Needs

Anna B. Miller, David King, Mary Rowland, Joshua Chapman, Monica Tomosy, Christina Liang, Eric Abelson, and Richard L. Truex



Forest  
Service

Pacific Northwest  
Research Station

General Technical Report  
PNW-GTR-993

December  
2020

# Evaluating Effects

Linear-based effects: Evaluation of wildlife responses to any linear path used for recreation.

- Roads (open to public motorized use).
- Motorized trails.
- Non-motorized trails.
- Natural linear paths (ocean beach, lakeshore).

Importantly, BLM/FS roads are used by all recreationists as recreation routes or as access to recreation sites. Recreation is now a dominant use of roads on many BLM and FS lands.

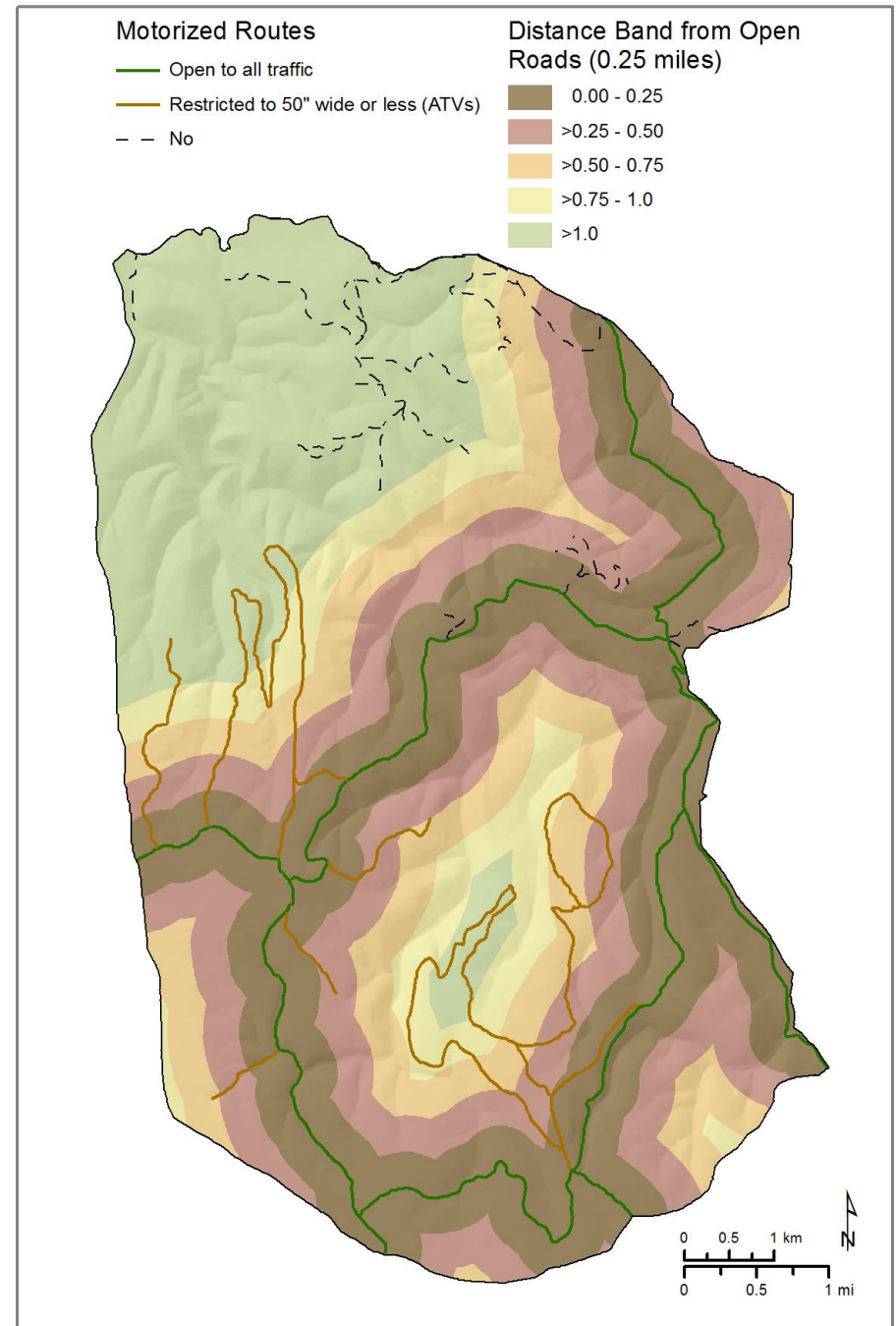


# Evaluating Effects

Linear-based effects of motorized roads.

Distance band analysis--developed in 1990s to evaluate spatial effects.

Percent area affected by human use of a linear route or path.



# Evaluating Effects

Point-based effects: Evaluation of wildlife responses to recreation at a discrete site.

- Hibernacula—bats, snakes.
- Nest colonies, rookeries—birds.
- Mating leks—birds, sometimes other taxa.
- Dens, burrows, roosts—all taxa.



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# Evaluating Effects

## Examples of point-based wildlife-recreation uses:

- Bat hibernacula in caves and spelunking.
- Falcon nests on cliffs and rock climbing.
- Wolverine winter dens and snow machine use.
- Corvids (avian predators) and campgrounds.

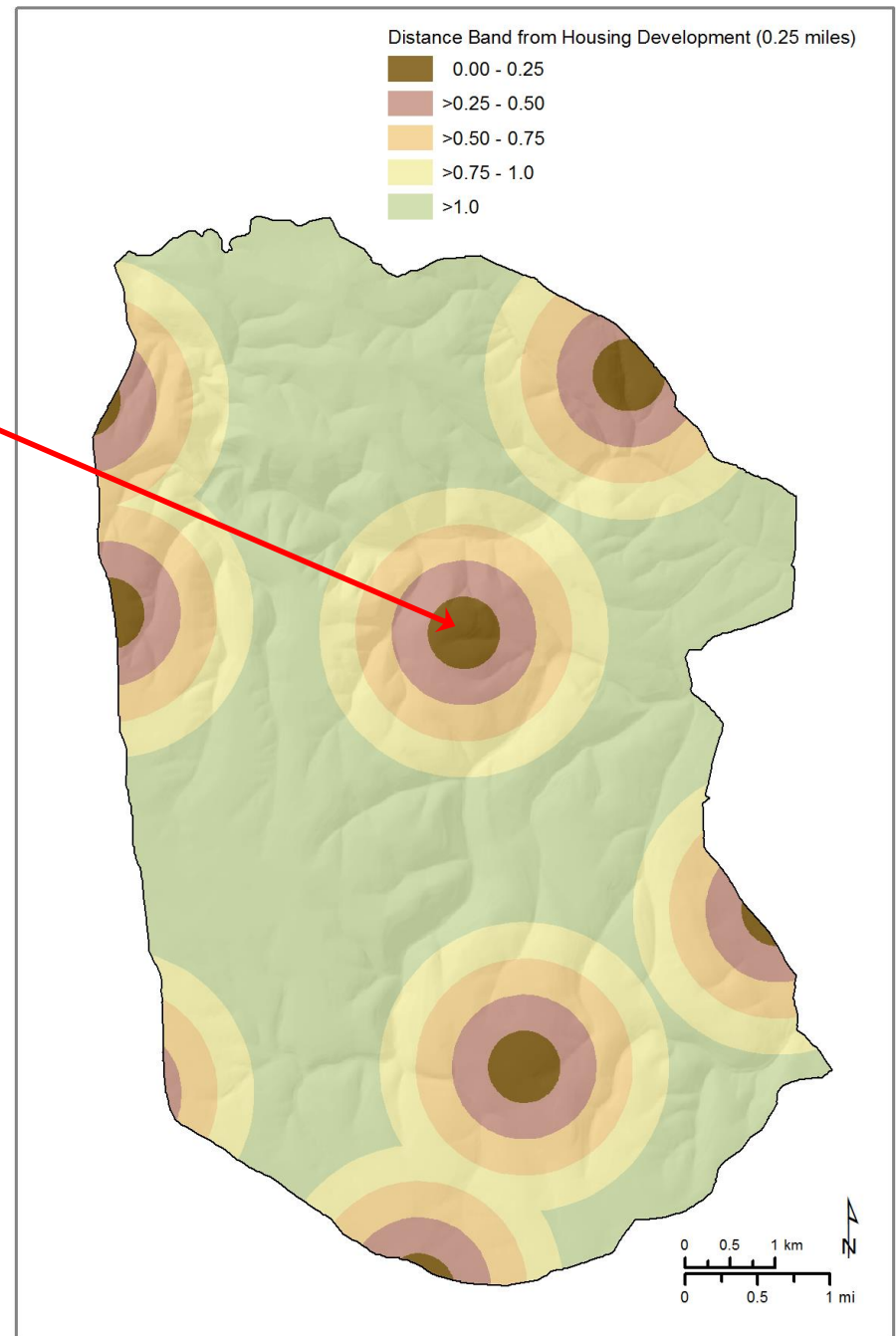


# Evaluating Effects

## Point-based effects:

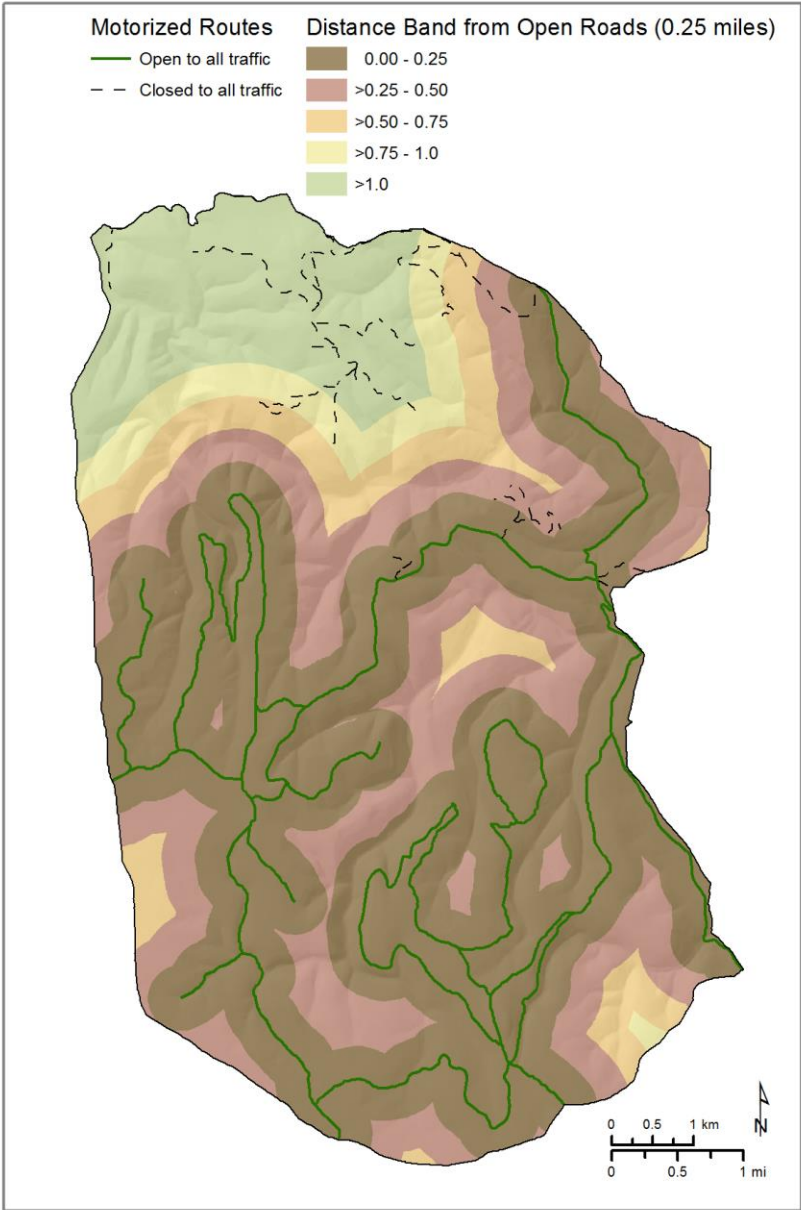
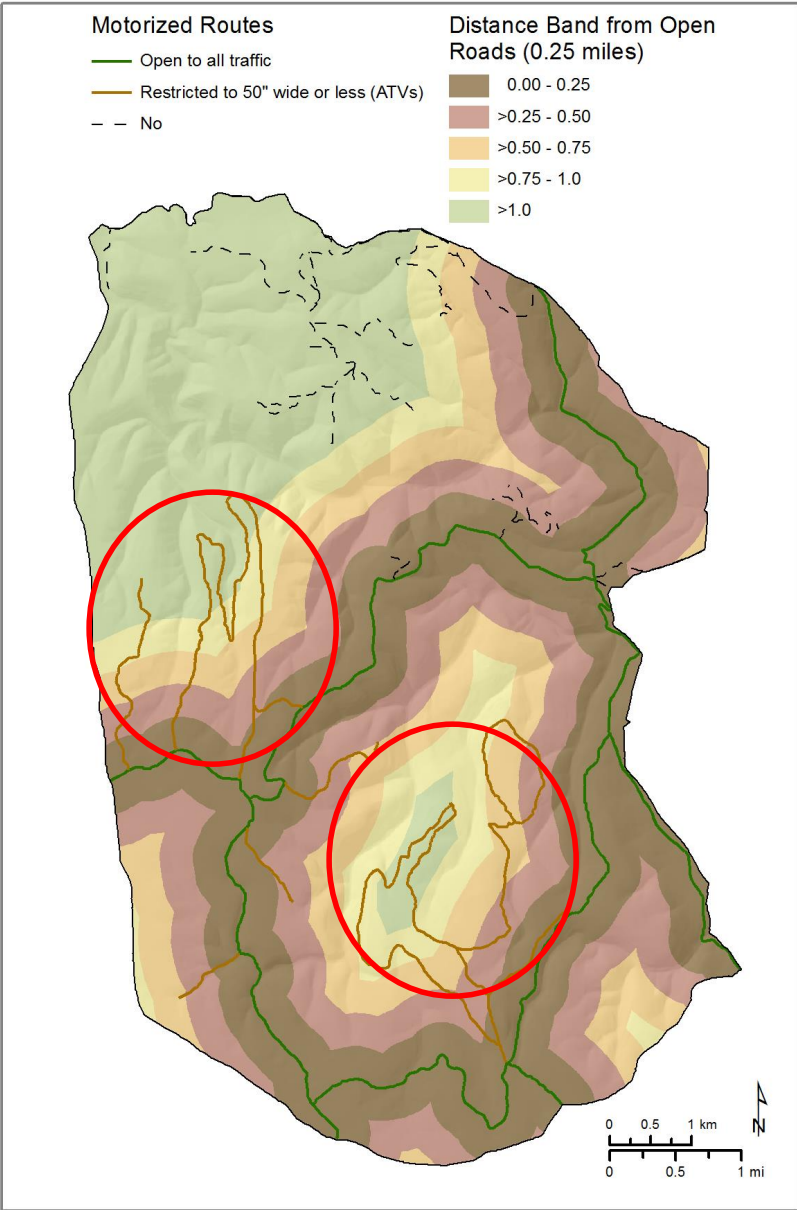
Recreation effects at specific use sites can also use distance band analysis.

Distance effects often weaker in contrast to linear effects but on-site (point-based) effects on wildlife much stronger.





# Evaluating Cumulative Effects

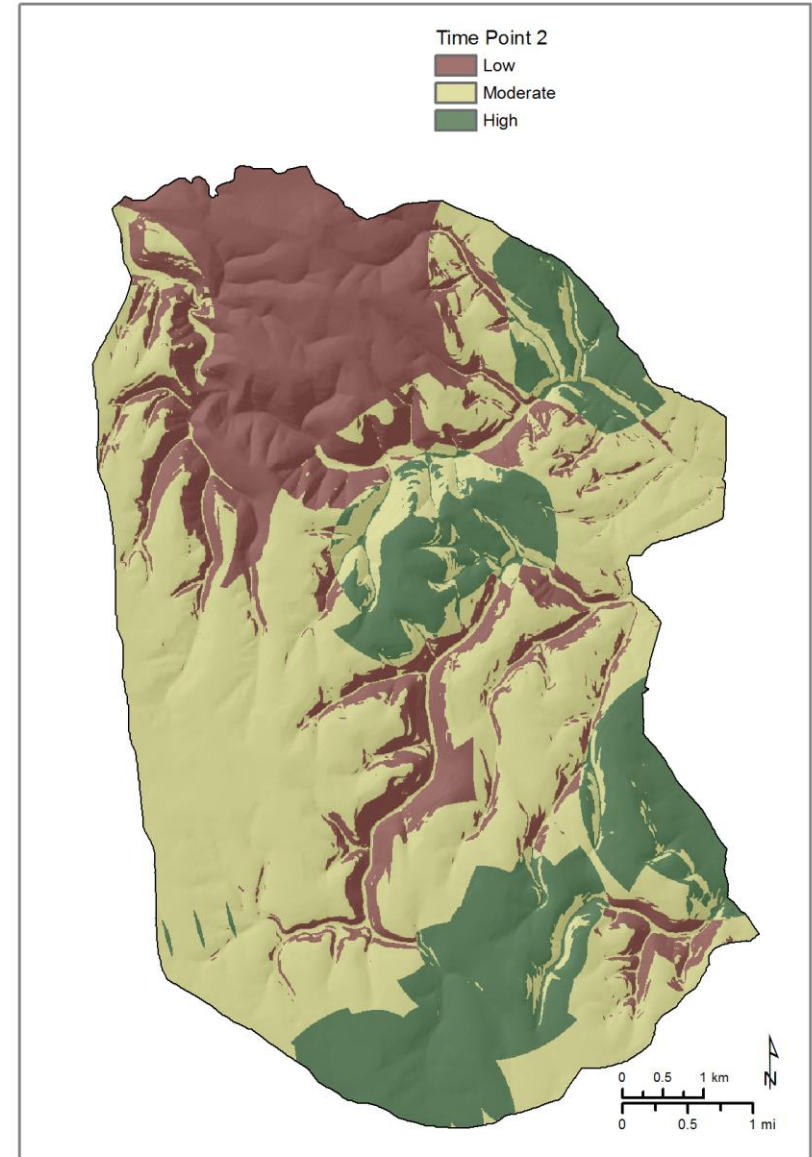


# Evaluating Cumulative Effects

Effects of factors can be:

- Additive
- Multiplicative
- Interactive, mitigative.
- Limiting, overriding.

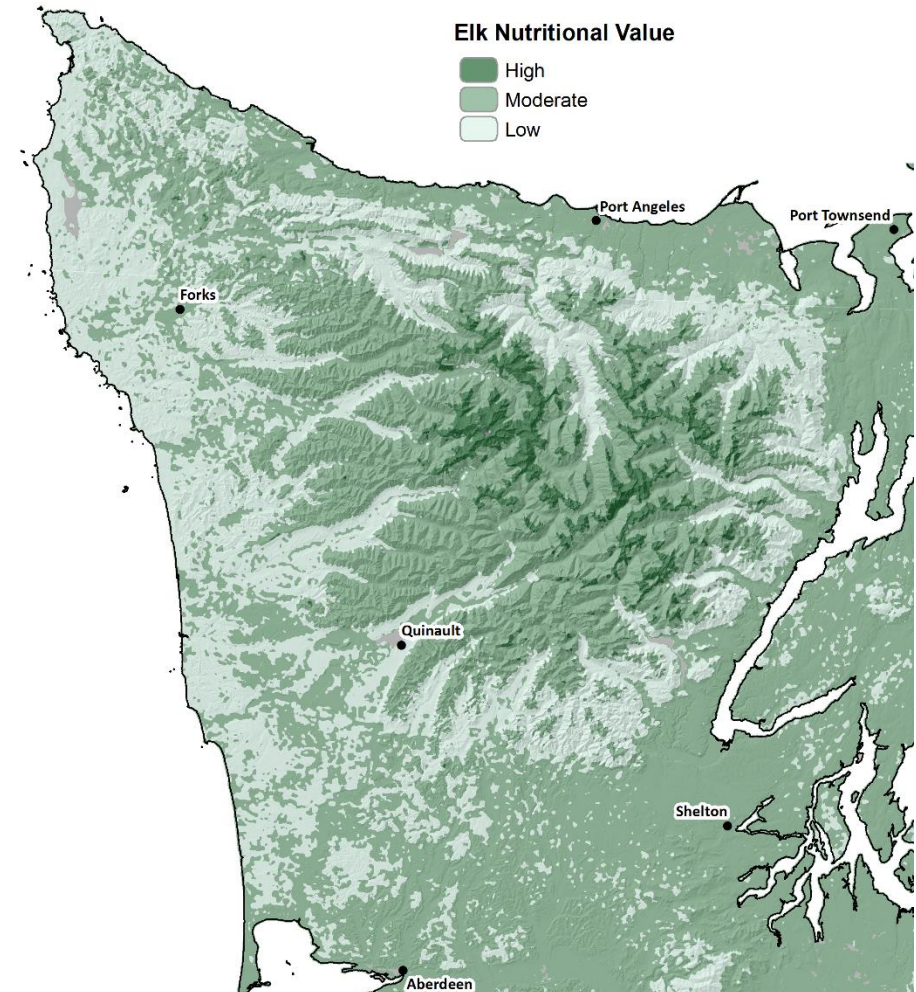
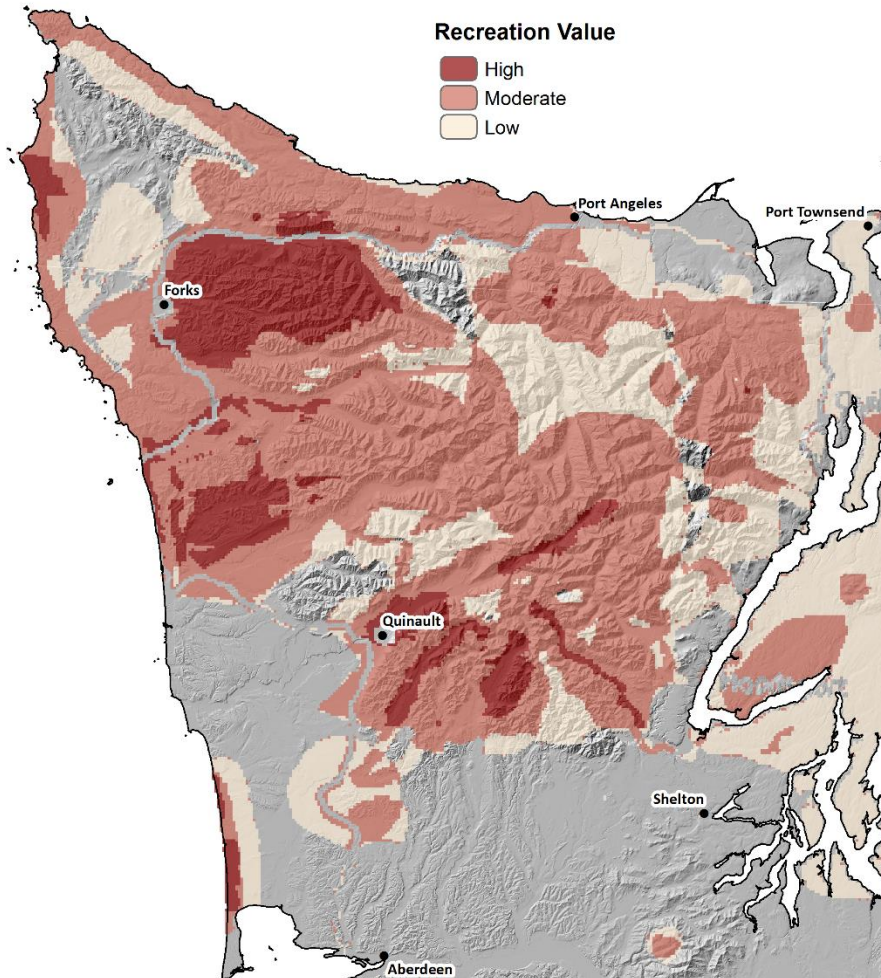
Quantitative modeling approaches (e.g., logistic regression) work well when dealing with 3 or more factors (covariates). Can use categorical covariates.





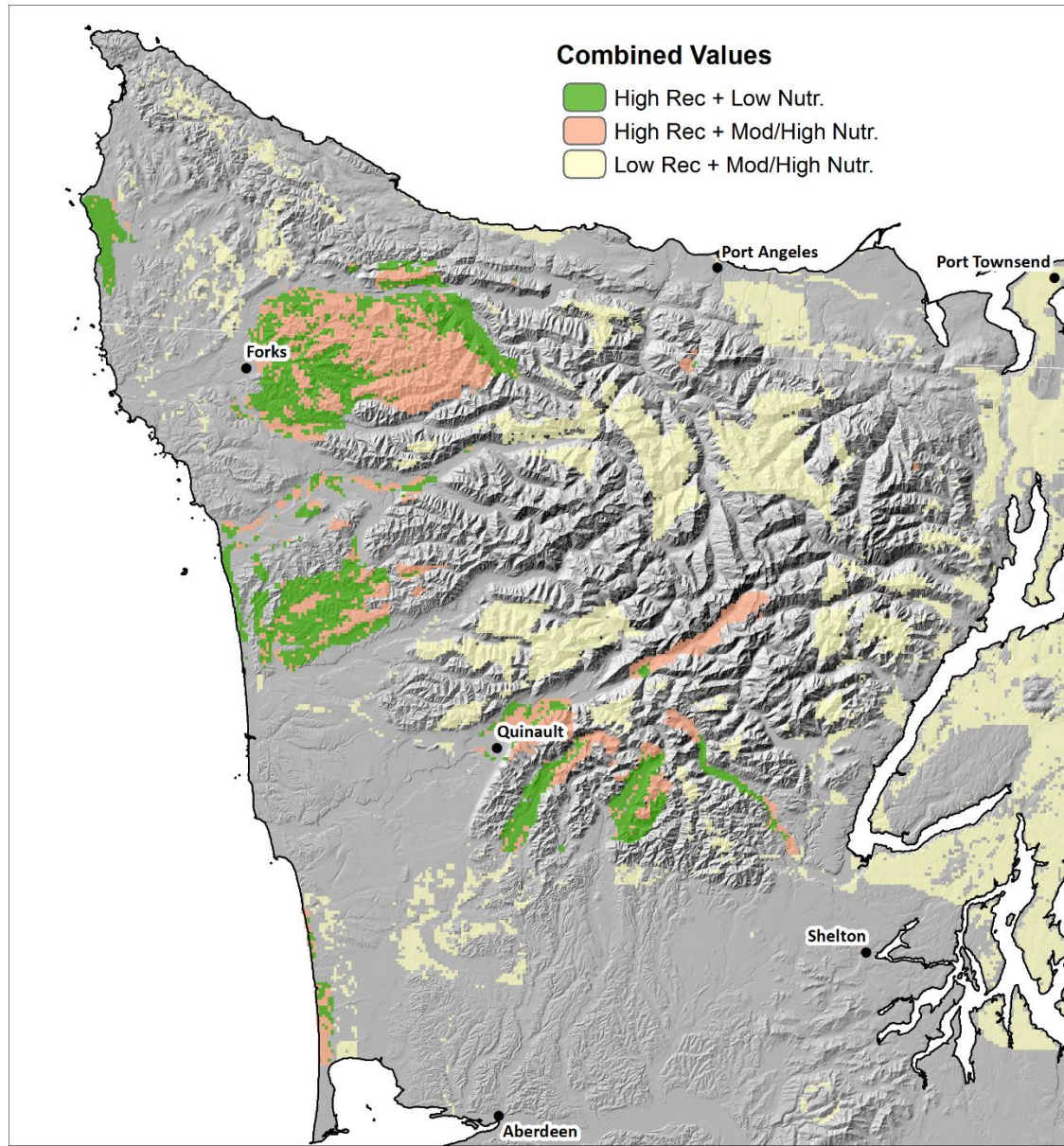
# Identifying Tradeoffs and Opportunities

- Spatial analyses of recreation-wildlife uses.





# Identifying Tradeoffs and Opportunities



# Public Participation in Recreation-Wildlife Planning

- Engage stakeholders by design--a strategic approach for managing recreation-wildlife issues.
- Include both recreation and wildlife advocates in all interactions, as well as “uninterested publics.”
- Waiting to react to an issue not efficient or usually helpful.



L. Cerveny



# Mapping Ecosystem Benefits

- What places on the landscape do you associate with important ecosystem benefits?
- Place colored dots on the map from the list.

**SCENERY**

**WILDLIFE HABITAT**

**FISH HABITAT**

**CLEAN WATER**

**HUNTING AREA**

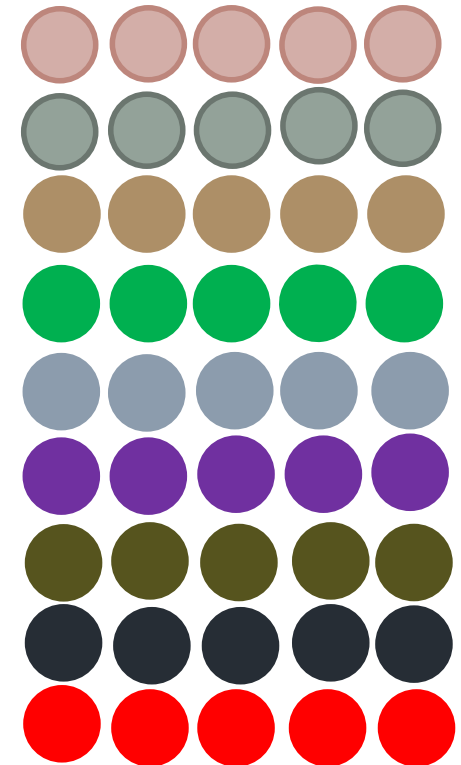
**FISHING AREA**

**FORAGING AREA**

**HERITAGE SITE**

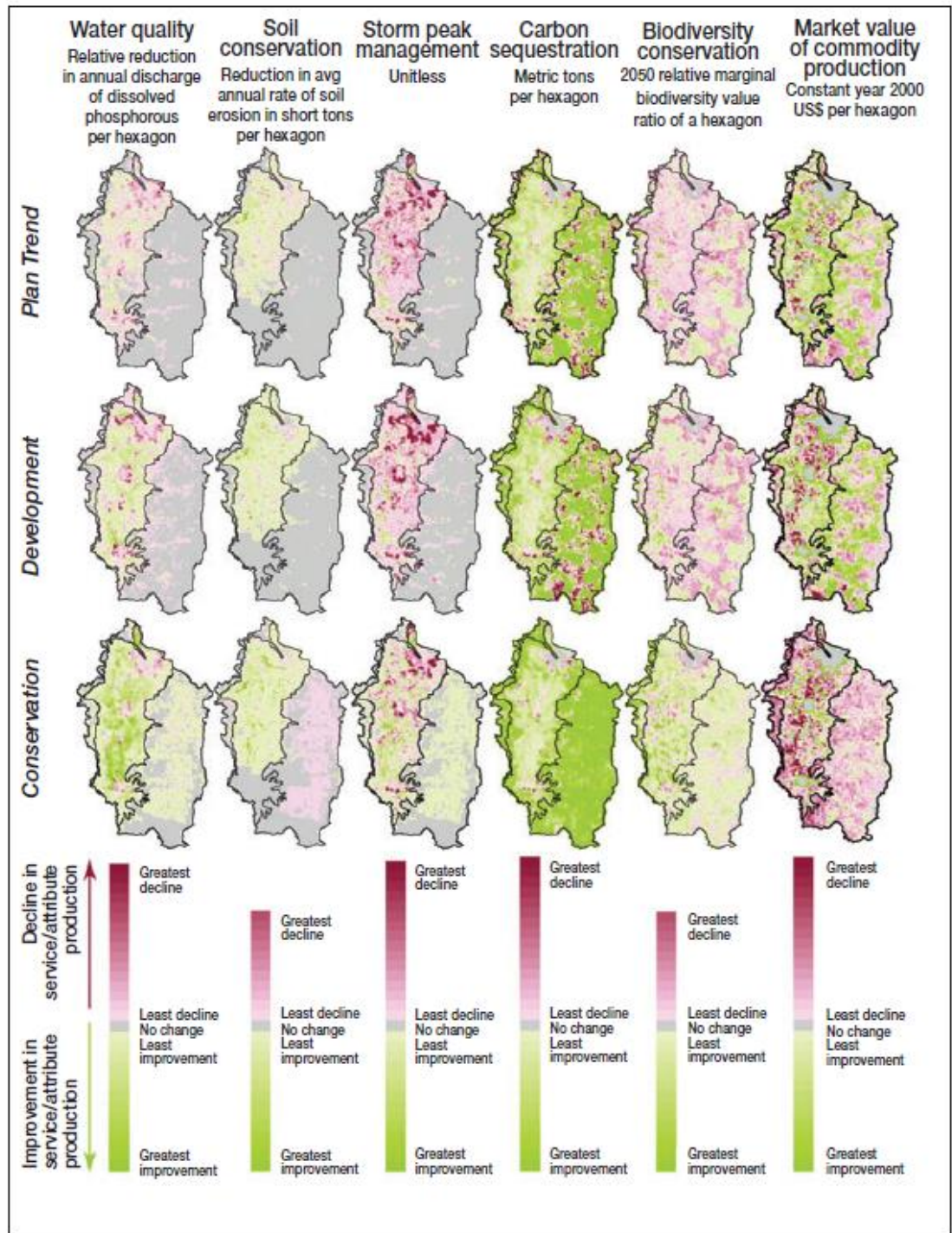
**RECREATION AREA**

Ecosystem Benefits



# Evaluating recreation-wildlife tradeoffs— identifying what is possible/not possible, what is likely/not likely.

Nelson et al. 2009. Modeling multiple ecosystem services, biodiversity conservation, commodity production, and tradeoffs at landscape scales. *Frontiers in Ecology and Environment*



# Integrated Research and Monitoring

- Integrate social and ecological sciences, referred to as socio-ecological systems (SES) research.



M. Rowland

# Challenges

- Public land managers will be exceedingly overwhelmed with ever-increasing recreational demands from a diversity of recreationists.
- Demands are likely to grow exponentially on public lands but staffing and available recreational opportunities are finite.





# Challenges

- Compromise and tradeoffs will not always be obvious, easy, or satisfactory to many groups or to land management agencies.
- New socio-ecological approaches to identify tradeoffs and facilitate balance in meeting recreation and wildlife objectives will be essential.



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# Challenges

- Strategic (in contrast to reactive) approaches are key.
- For public lands farther from urban areas, balanced allocation of recreational uses with wildlife priorities are more easily agreed upon with stakeholders before recreational demands increase further--get ahead of the “recreational wave” headed toward remote areas (focus often is on vegetative management in remote areas).



# PNW Research Station Contacts on Wildlife Responses to Human Activities

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# Questions and Thoughts?



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