State of the Science Recreation and Wildlife: Integrated Approaches for Research and Management

2018 Recreation-Wildlife Workshop

May 7, 2018, Corvallis OR

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.

- FS Terrestrial scientist, Interior Columbia Basin, 4 years
- FS Region 6 wildlife ecologist, 4 years
- BLM Wildlife biologist, 7 years

--Recreation-wildlife issues were prominent in all jobs.

--Frequent interaction with recreation stakeholders.

M. Hemstron

Presentation

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

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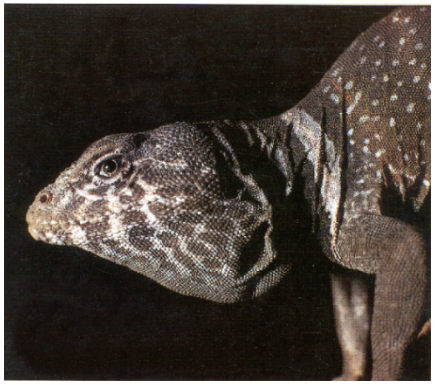

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M. Patrikeev

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.
- ????

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 is low, often 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.

Oregon Dept. of Parks and Recreation

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.

Swazi Trails Adventure Caving, www.swazitrails.co.sz

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.

www.llascc.weebly.com

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.

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).

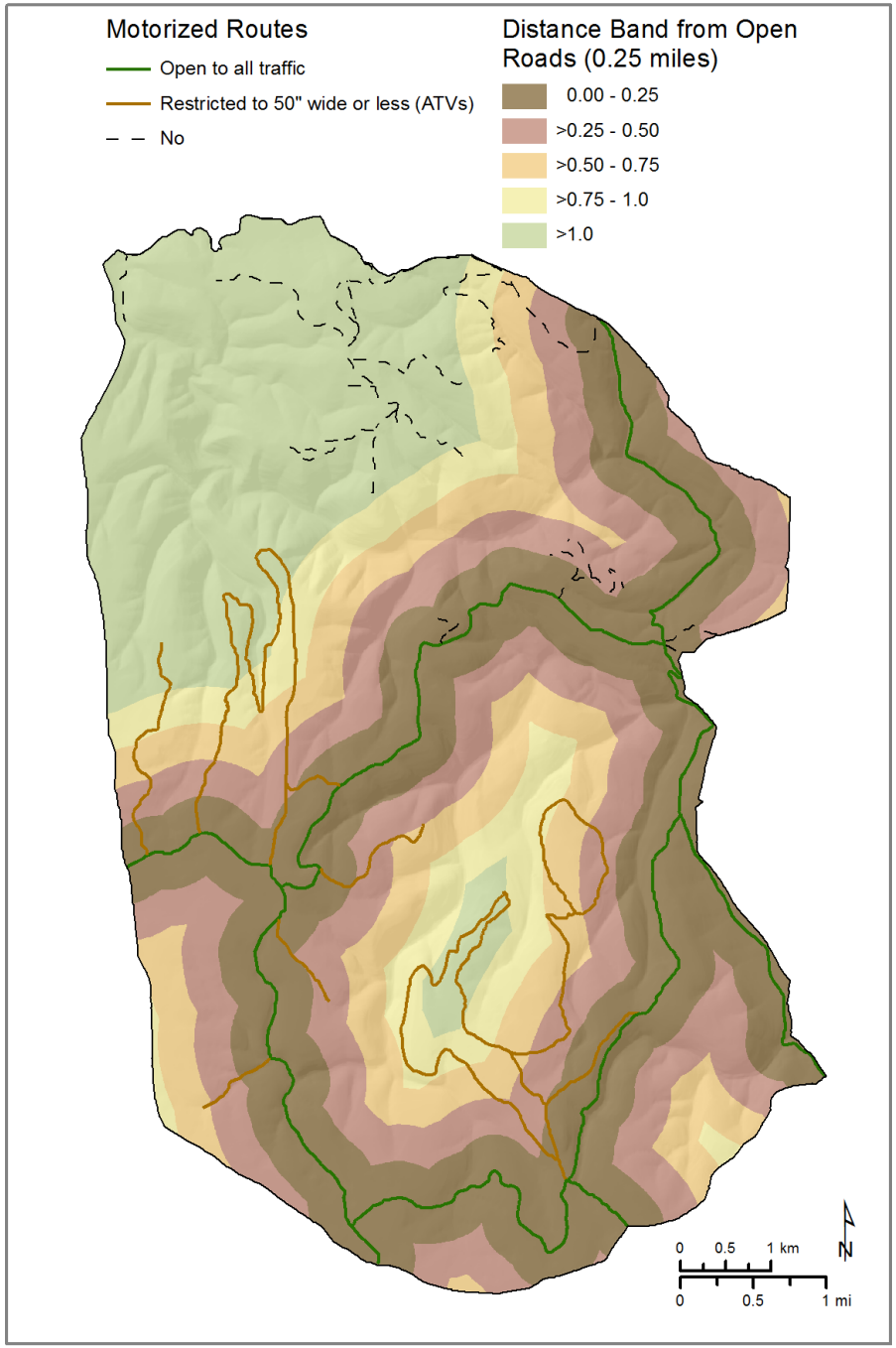
Note! BLM/FS roads are used by all recreationists as recreation routes or as access to recreation sites. Recreation is now a dominant use of roads on many BLM and FS lands.

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.

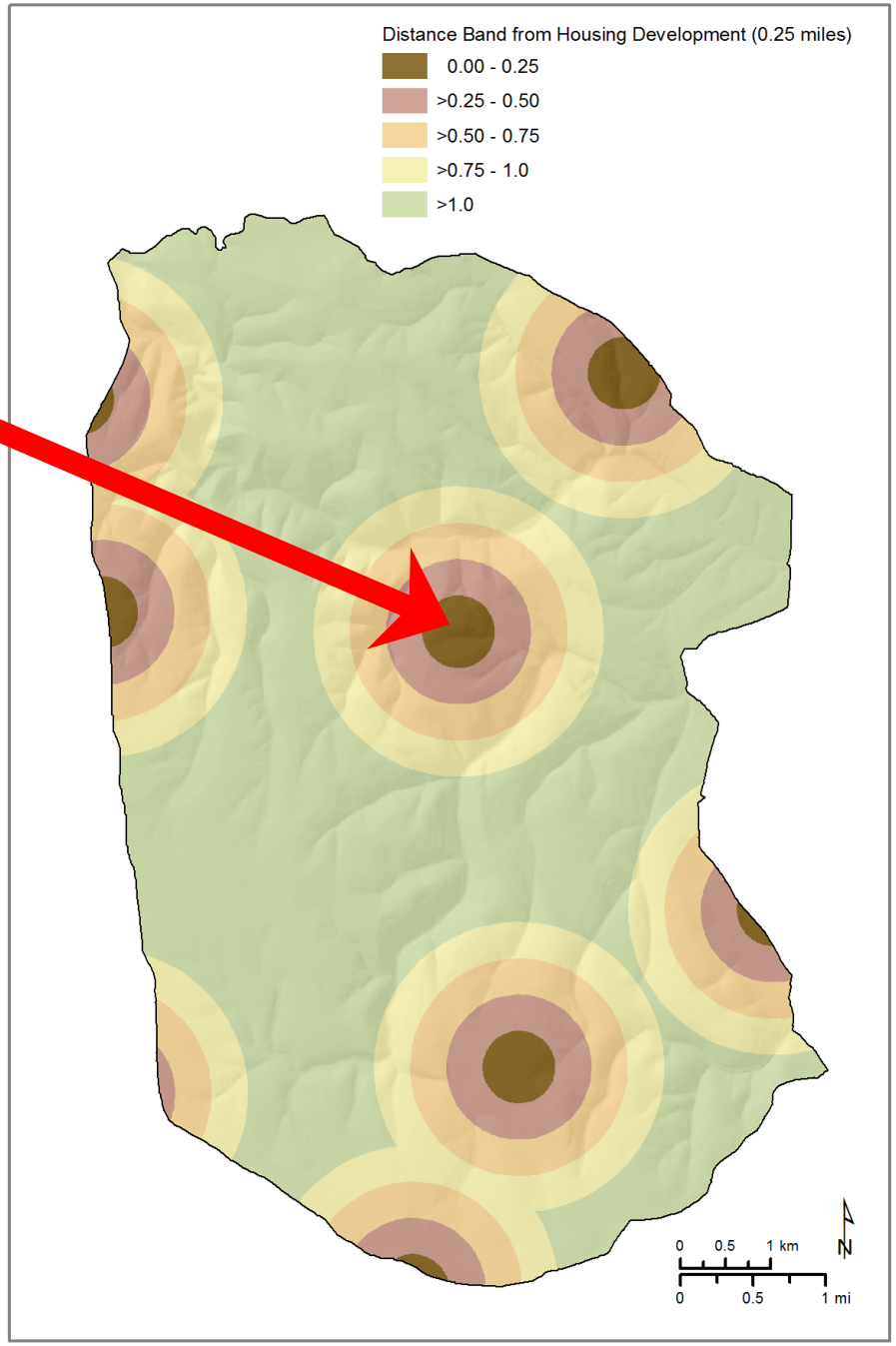
www.science.gov

Evaluating Effects

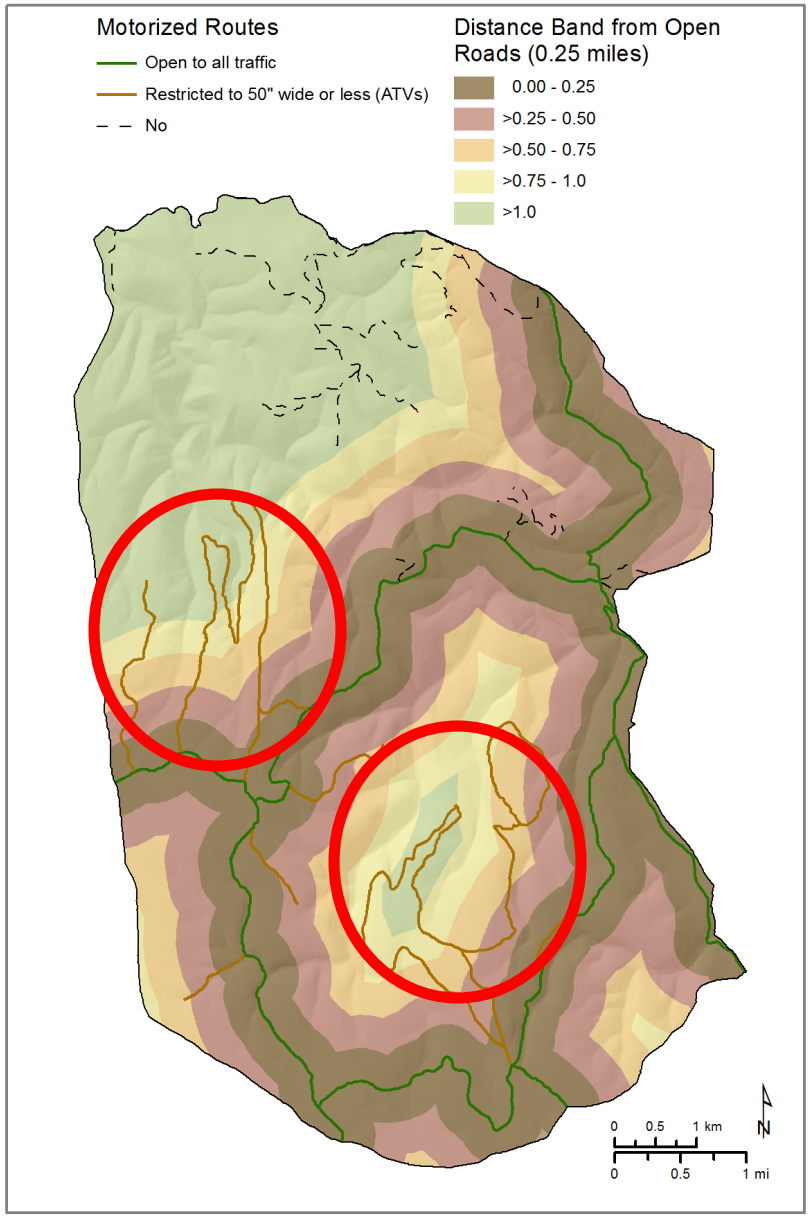
Point-based effects:

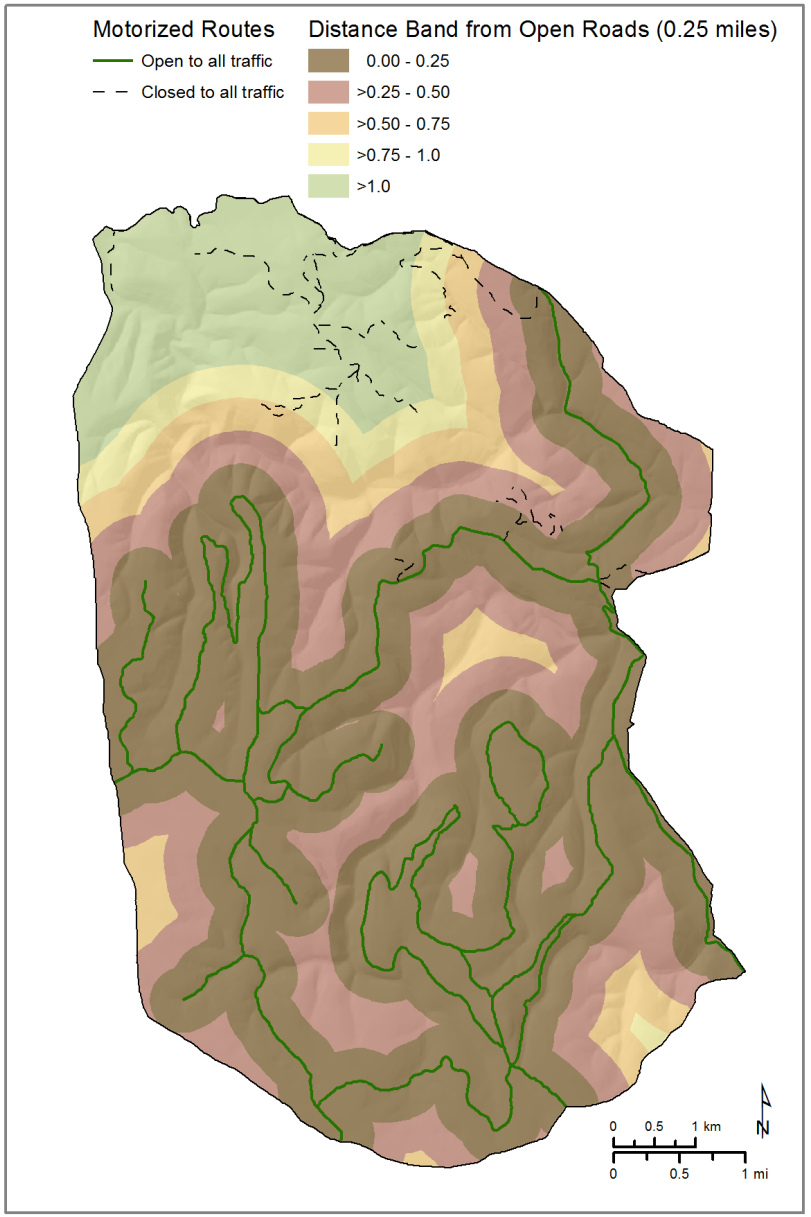
Recreation effects at specific use sites can also use distance band analysis.

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



Evaluating Cumulative Effects





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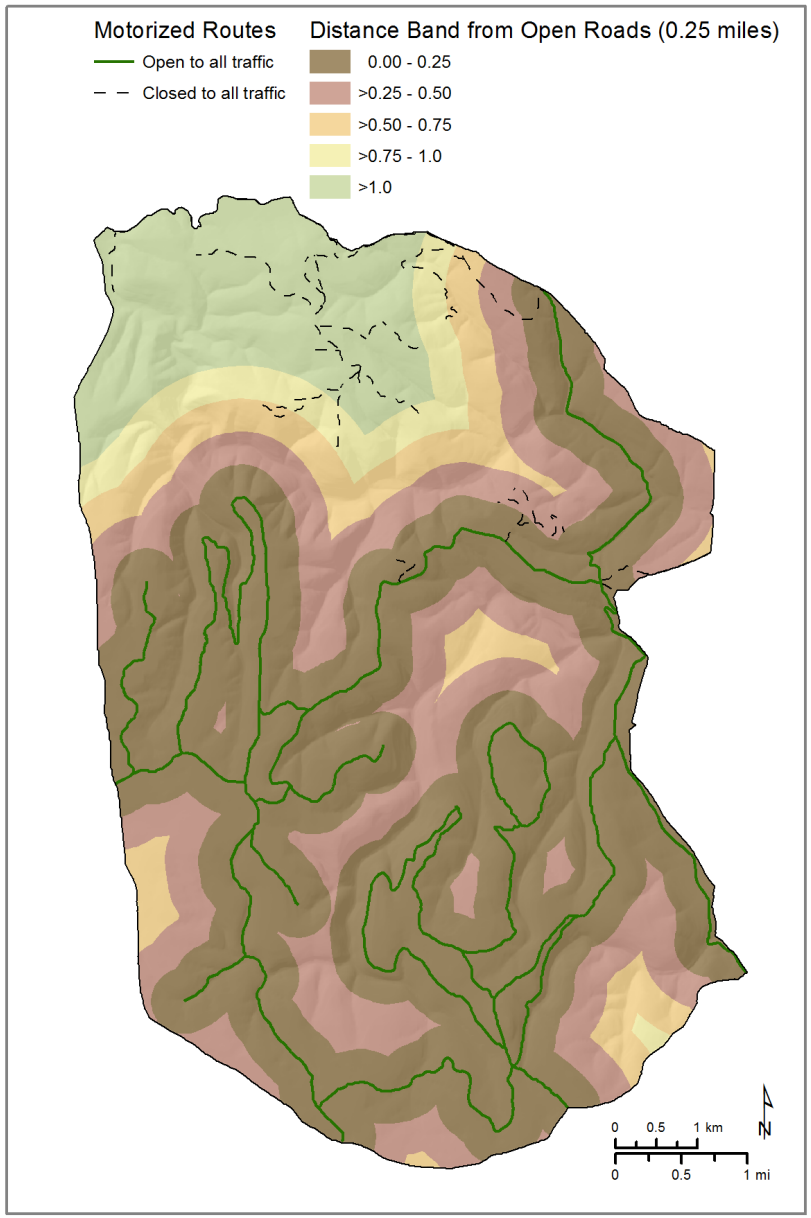

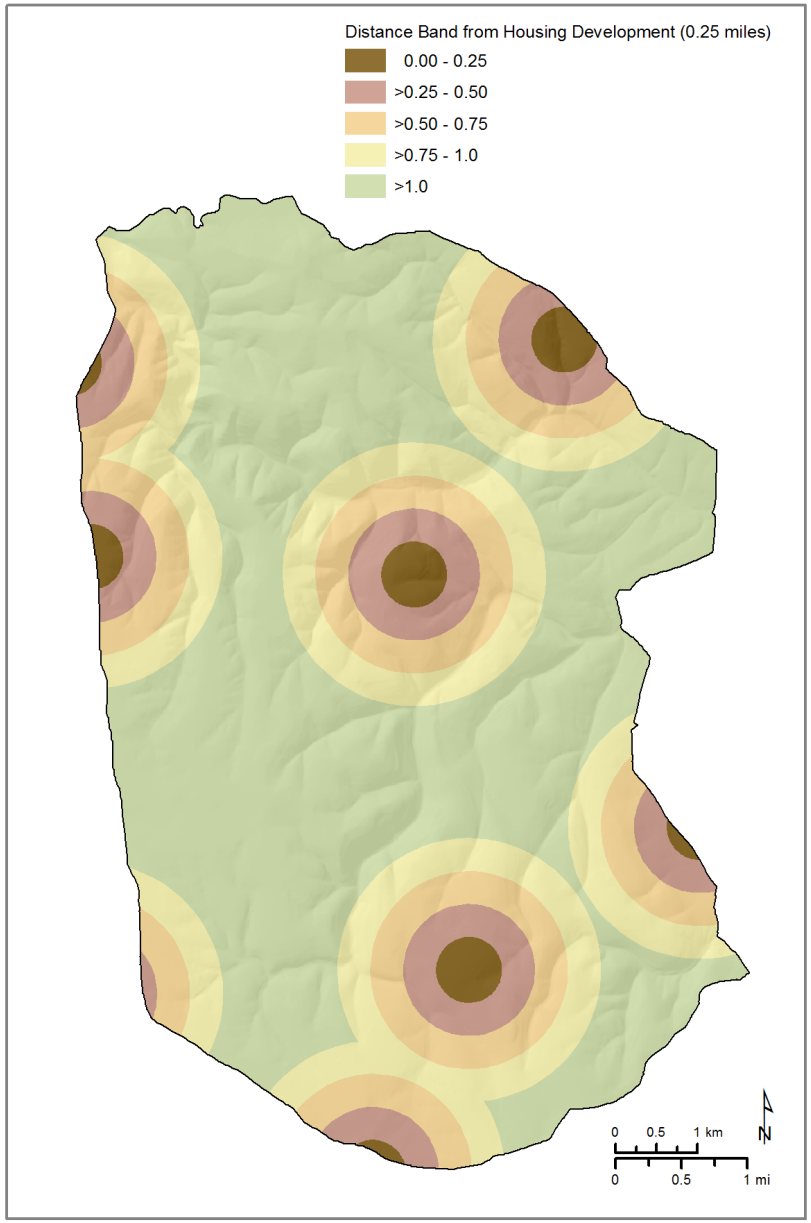

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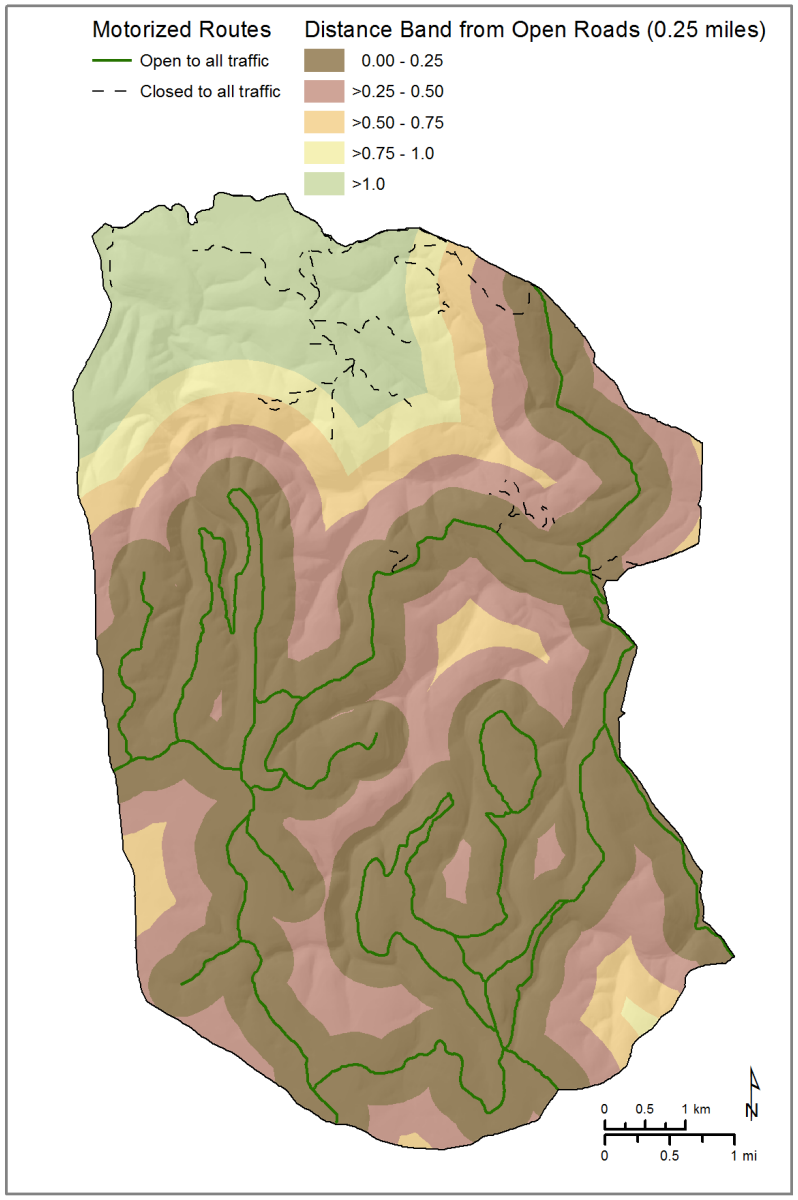
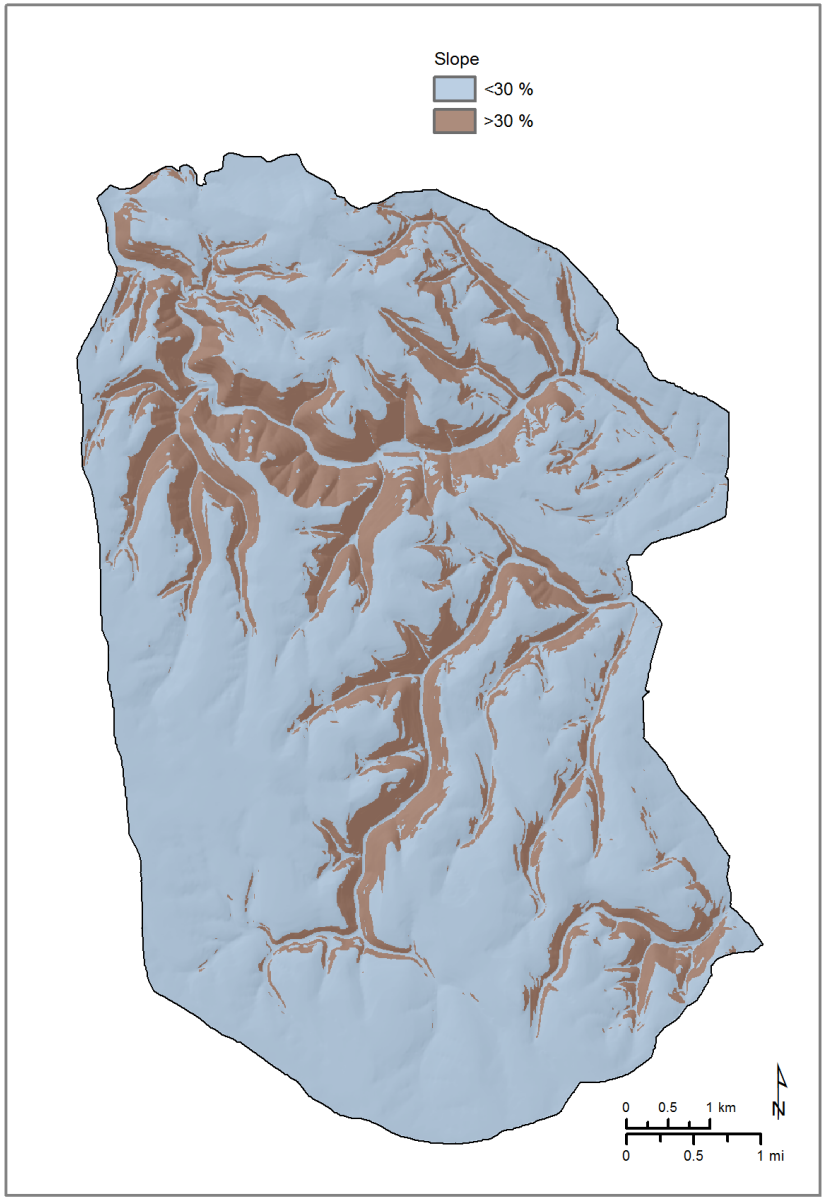
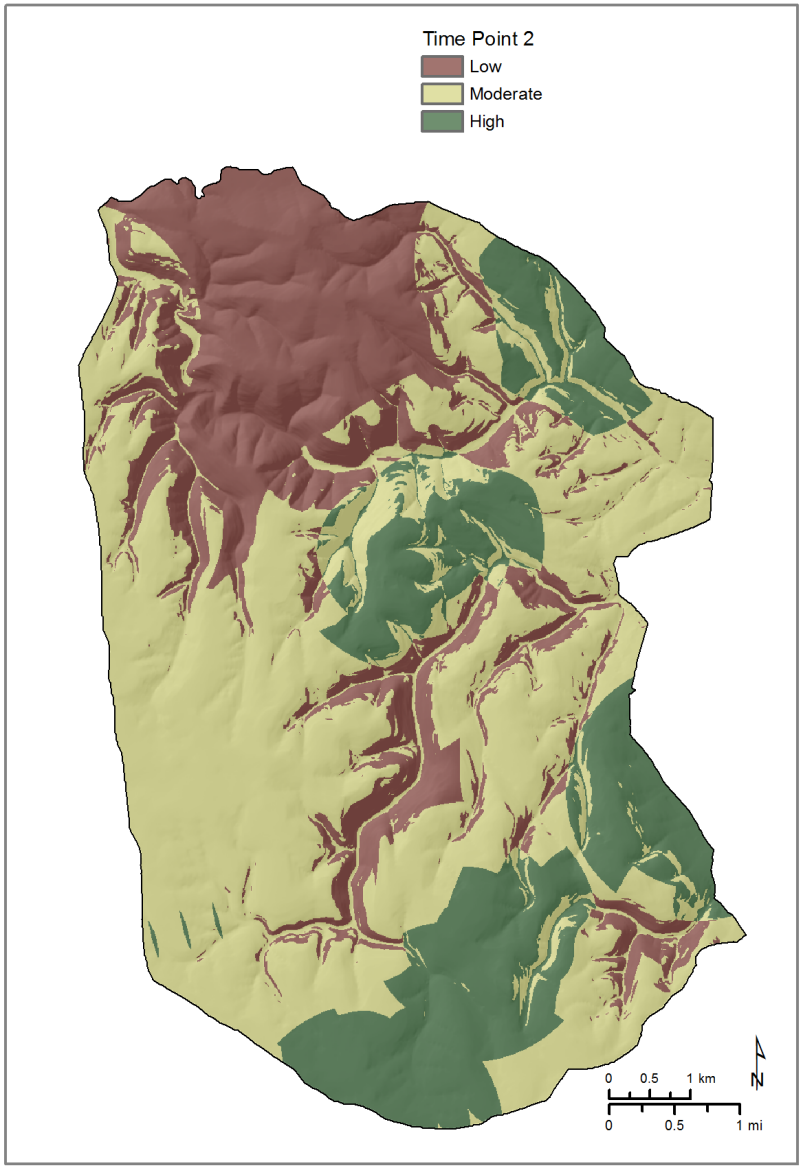




Evaluating Cumulative Effects

- Roads + ATV Routes + Key Nest Sites + Slope Mitigation = Cumulative Probability of Wildlife Avoidance (or Use).

- Cumulative effects maps well-represented in formal modeling such as resource selection functions and occupancy models.

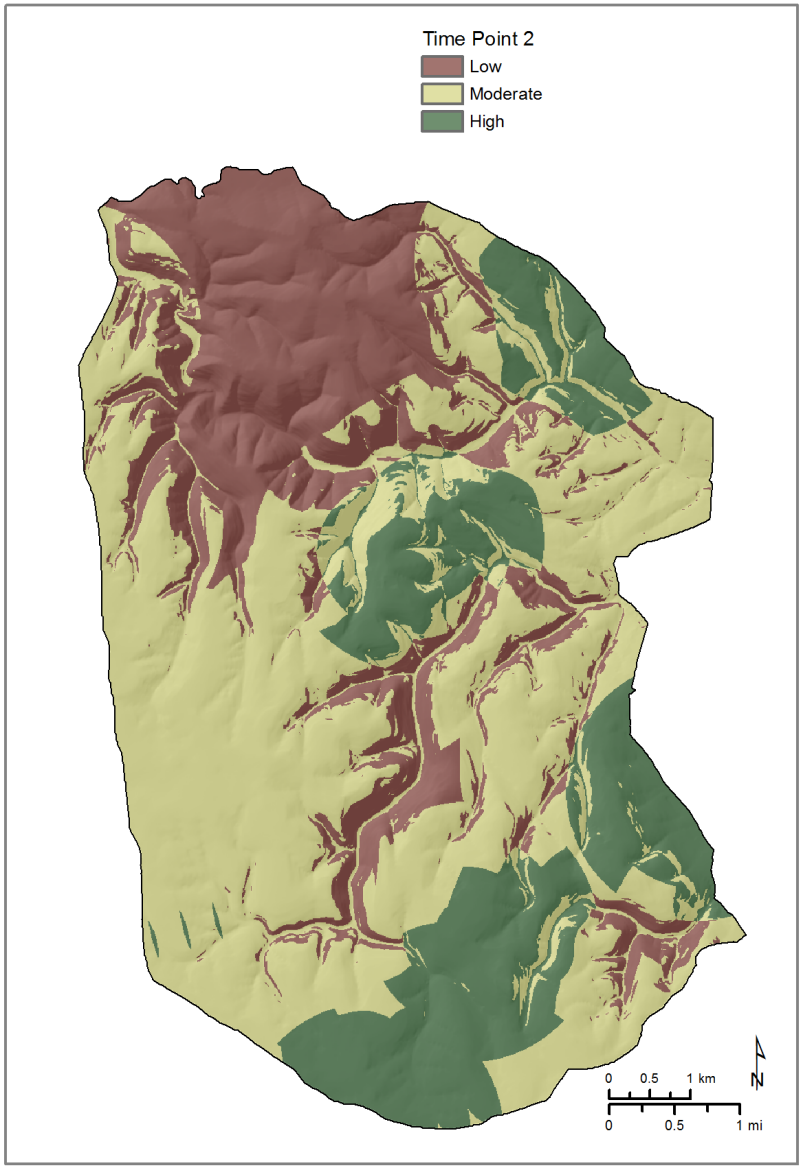


Evaluating Cumulative Effects

Effects of factors can be:

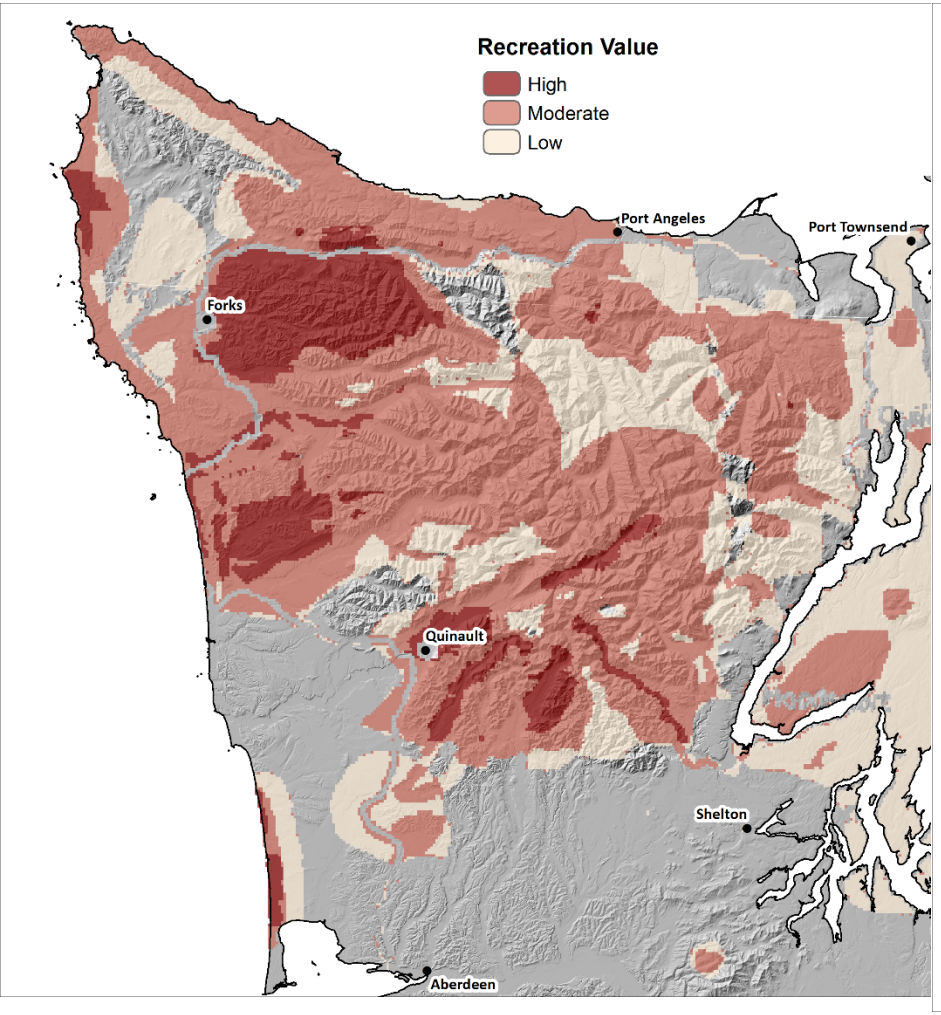
- Additive
- Multiplicative
- Interactive, mitigative.
- Limiting, overriding.

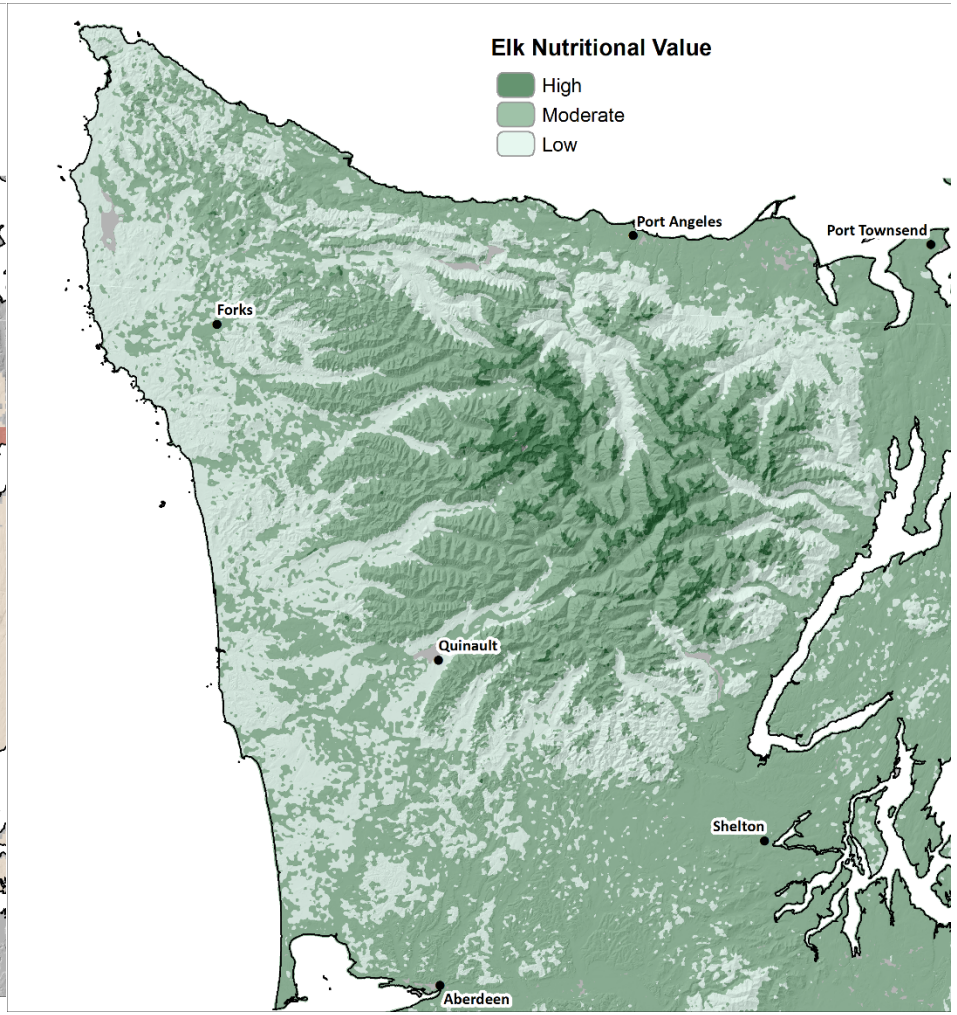
Quantitative modeling approaches (e.g., logistic regression) work well when dealing with 3 or more factors (covariates). Can use categorical covariates.



Identifying Tradeoffs and Opportunities

- Spatial analyses of recreation-wildlife uses.





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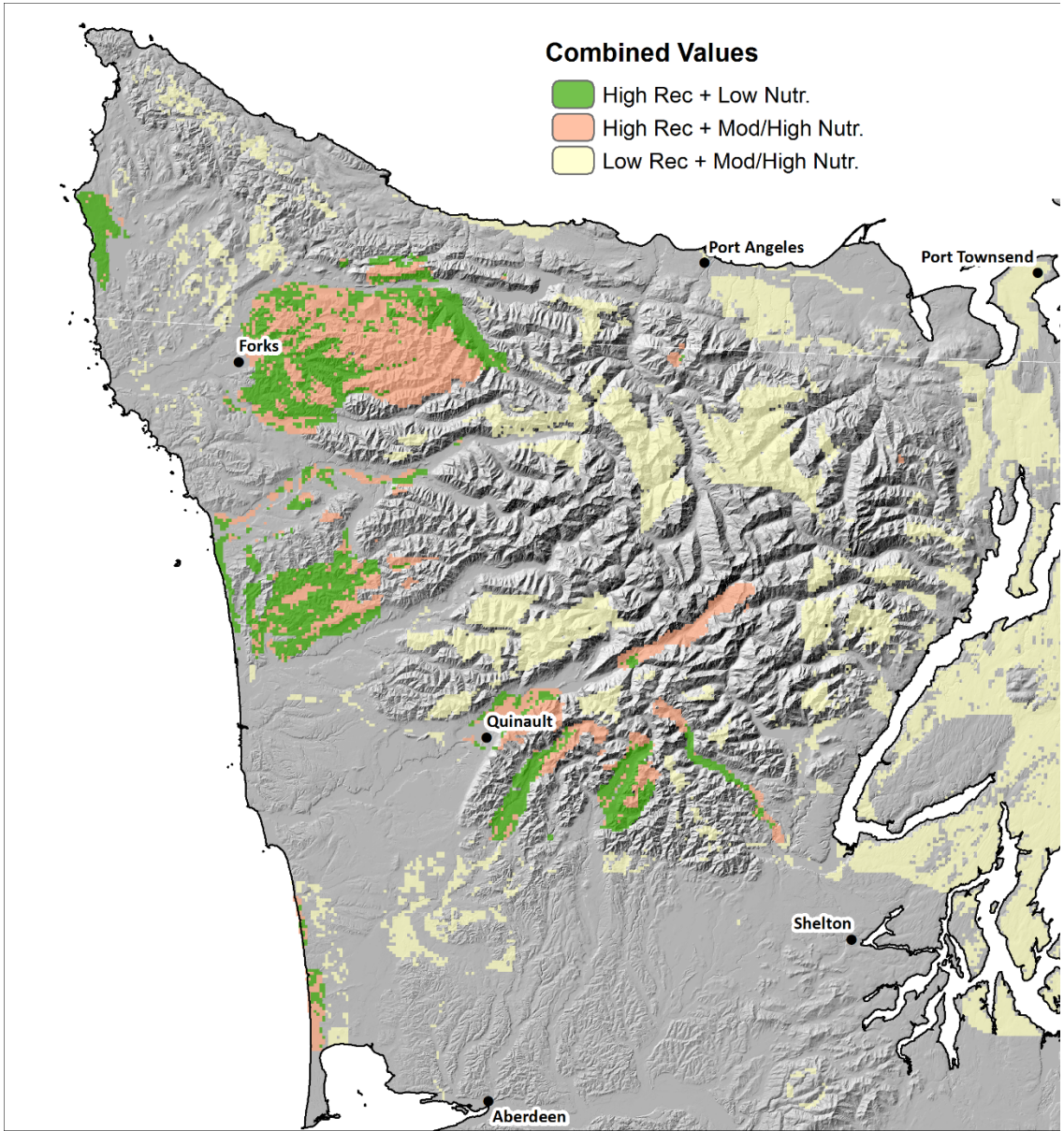


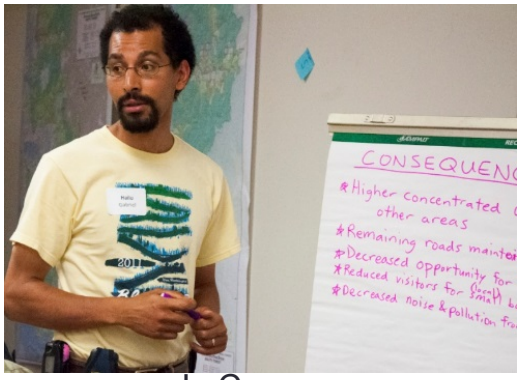
Public Participation in Recreation-Wildlife Planning

- 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

Social Science Research Needs

- Survey recreation and wildlife stakeholders, non-stakeholders, managers, resource specialists, and scientists across a geographic spectrum of public lands.



L. Cerveny

- Document perceptions, attitudes, desires, and willingness to consider different approaches for recreation-wildlife research and management.

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Social Science Research Needs

- Use surveys as part of human ecology mapping to improve dialogue about spatially-explicit recreation values in relation to wildlife use.

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

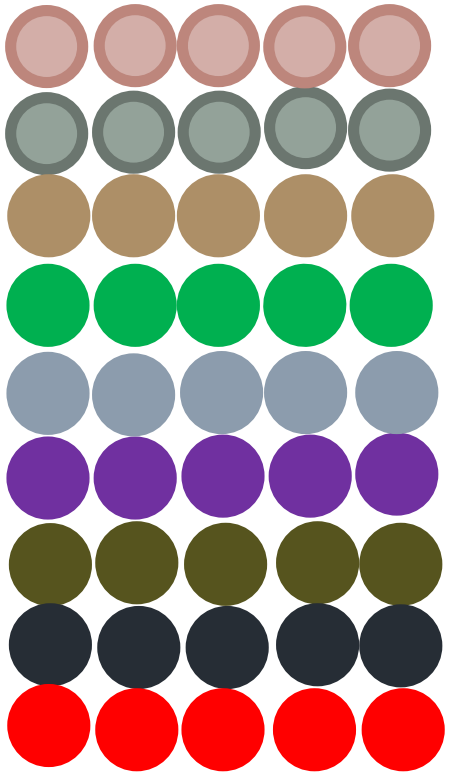
FISHING AREA

FORAGING AREA

HERITAGE SITE

RECREATION AREA

Ecosystem Benefits

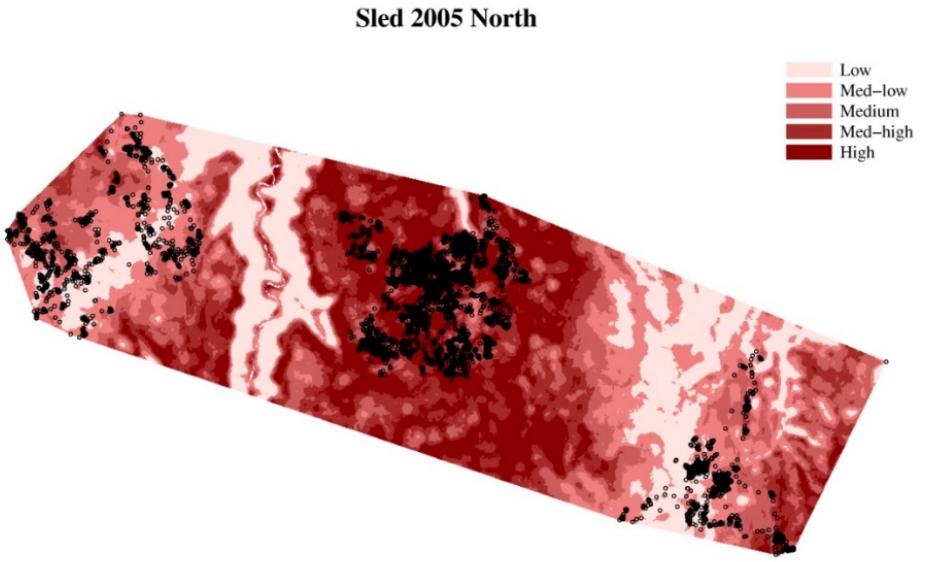


Wildlife Research Needs

- Recreation effects on under-studied wildlife taxa.
- Controlled landscape studies with replication.
- Fitness responses to recreation.
- Simulation modeling to further address fitness.

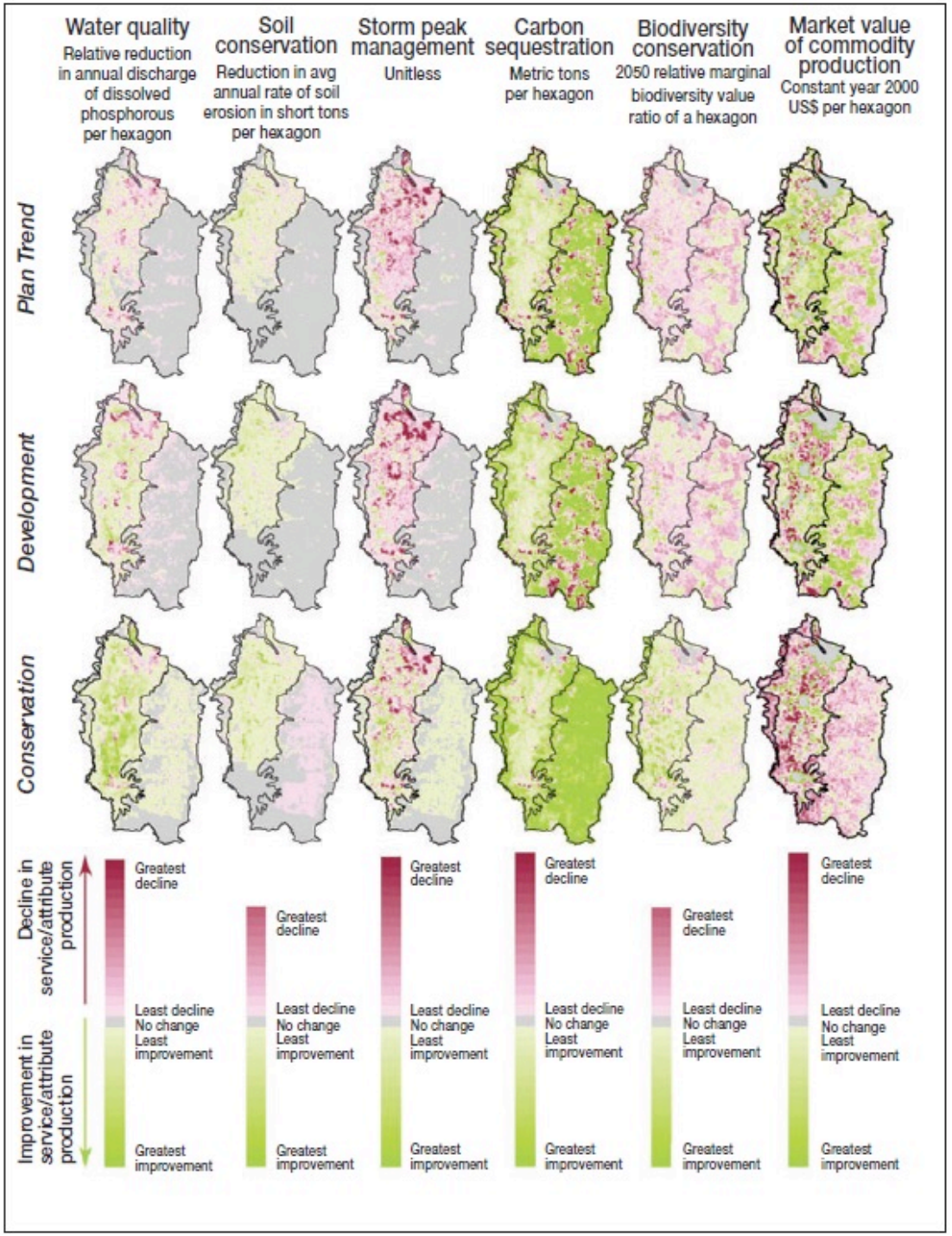
Wildlife Research Needs

- Cumulative effects of multiple, interacting factors.
- Contribution of recreation with non-recreation factors (e.g., resource selection function models).
- Optimization modeling of recreation-wildlife tradeoffs and opportunities.



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 Needs

- 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.

www.thisiswhyimbroke.com

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 addition 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).

M. Hemstron

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Questions and Thoughts?

U.S. Fish and Wildlife Service

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