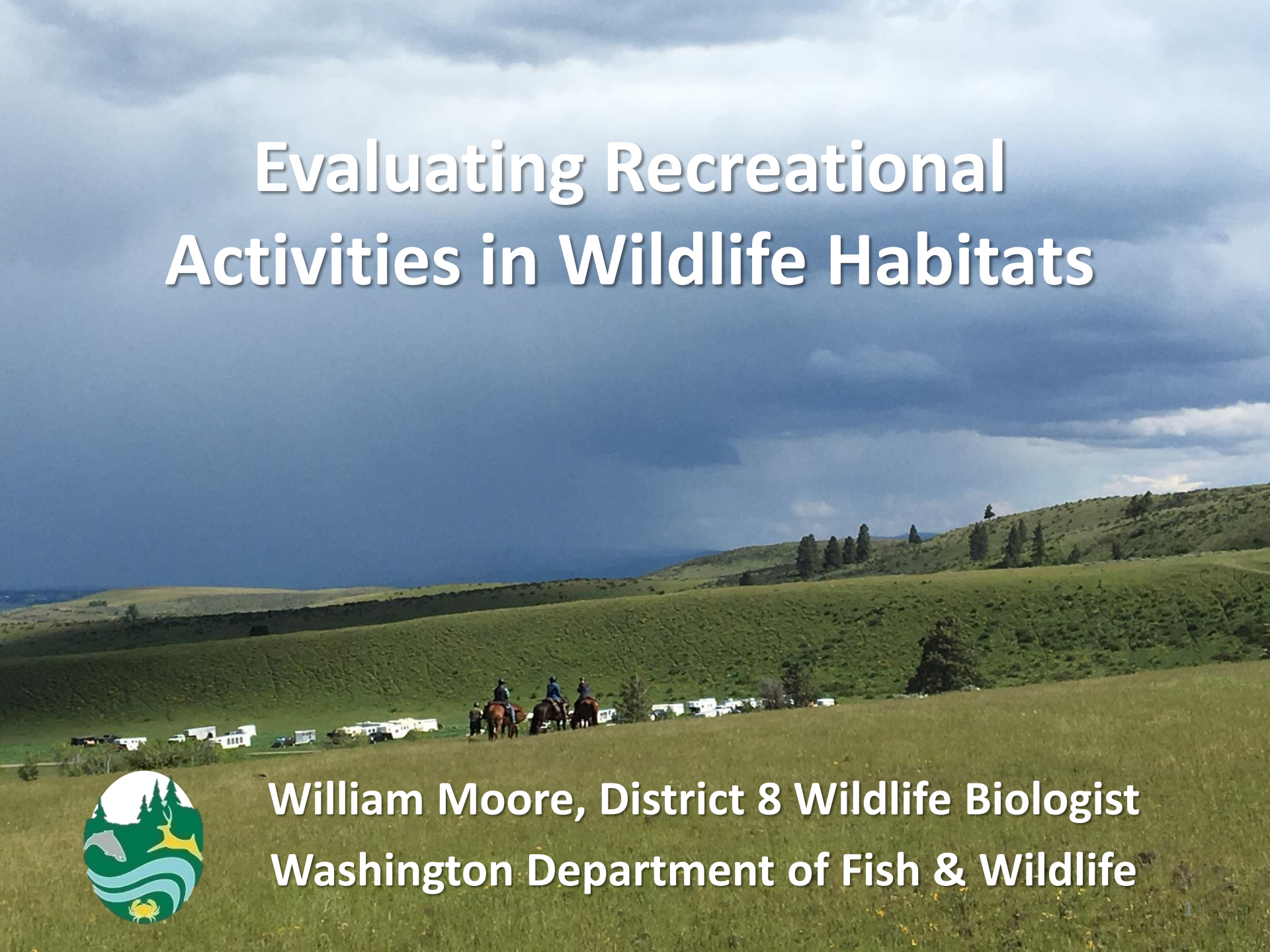
Evaluating Recreational Activities in Wildlife Habitats



William Moore, District 8 Wildlife Biologist
Washington Department of Fish & Wildlife

Presentation Overview

- **Understand how recreational activities influence wildlife**
- **Review an example recreation model**
- **Discuss modeling possibilities to inform recreation management decisions**

Gaines, William L.; Singleton, Peter H.; Ross, Roger C. 2003. Assessing the cumulative effects of linear recreation routes on wildlife habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 79 p.

Recreation & Wildlife Conservation Goals

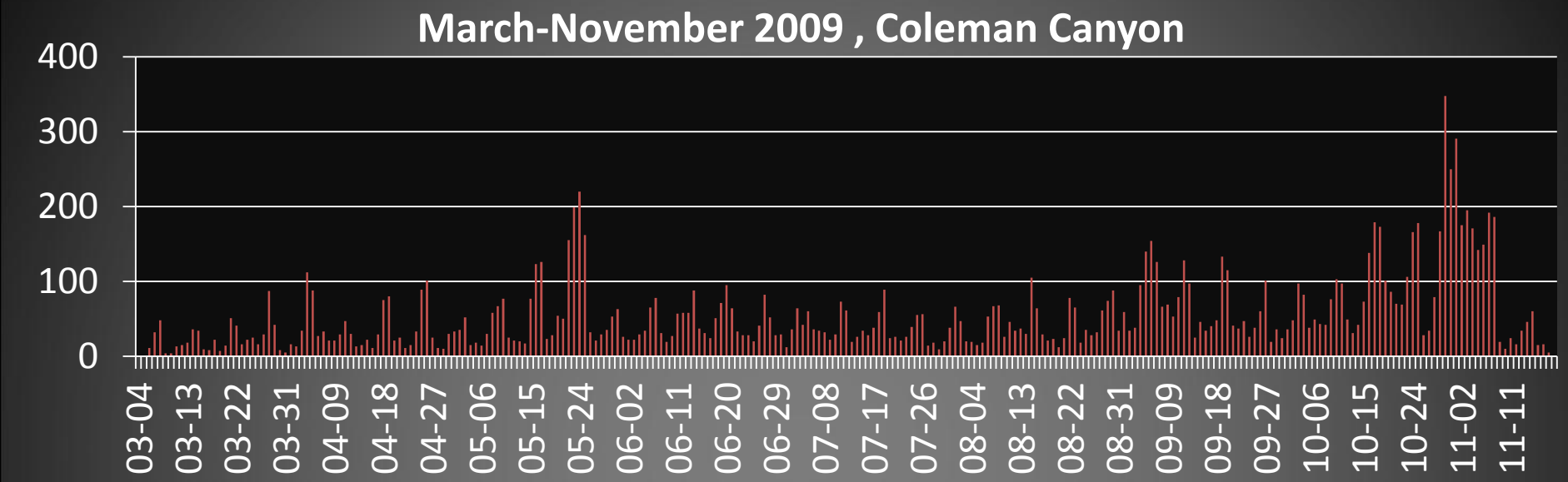
Stemilt-Squilchuck Vision Plan

- Shared Vision and Goals for the Landscape

WDFW

- Mission Statement

Recreation's Cumulative Effects



Stemilt-Squilchuck Community Vision Plan

Table 5.2 Traffic Counter Summary

Traffic Counter	Start/End Date	Total Count	Average/Month	Peak Month
Upper Basin Loop Road	4/6 - 11/20/2007	10,004	1,434	May (3,073)
Lily Lake Road	4/6 - 11/20/2007	7,384	923	May (1,988)
Orr Creek Road	4/6 - 11/20/2007	9,123	1,140	May (2,353)
Schaller Road*	8/2006 - 3/2008	5,344	267	October (892, 863)
Lily Lake Road**	1/15 - 3/9/2008	2,095	N/A	N/A

*Count number has been divided by two, accounting for vehicles entering and exiting
** This counter was installed to track snowmobile use during the winter months

[12] Informal estimate provided by Stemilt Recreational Technical Subcommittee, March 9, 2008.

Types of Interactions

Harvest

- Hunting
- Poaching
- Collisions
- Trapping

Habitat Modification

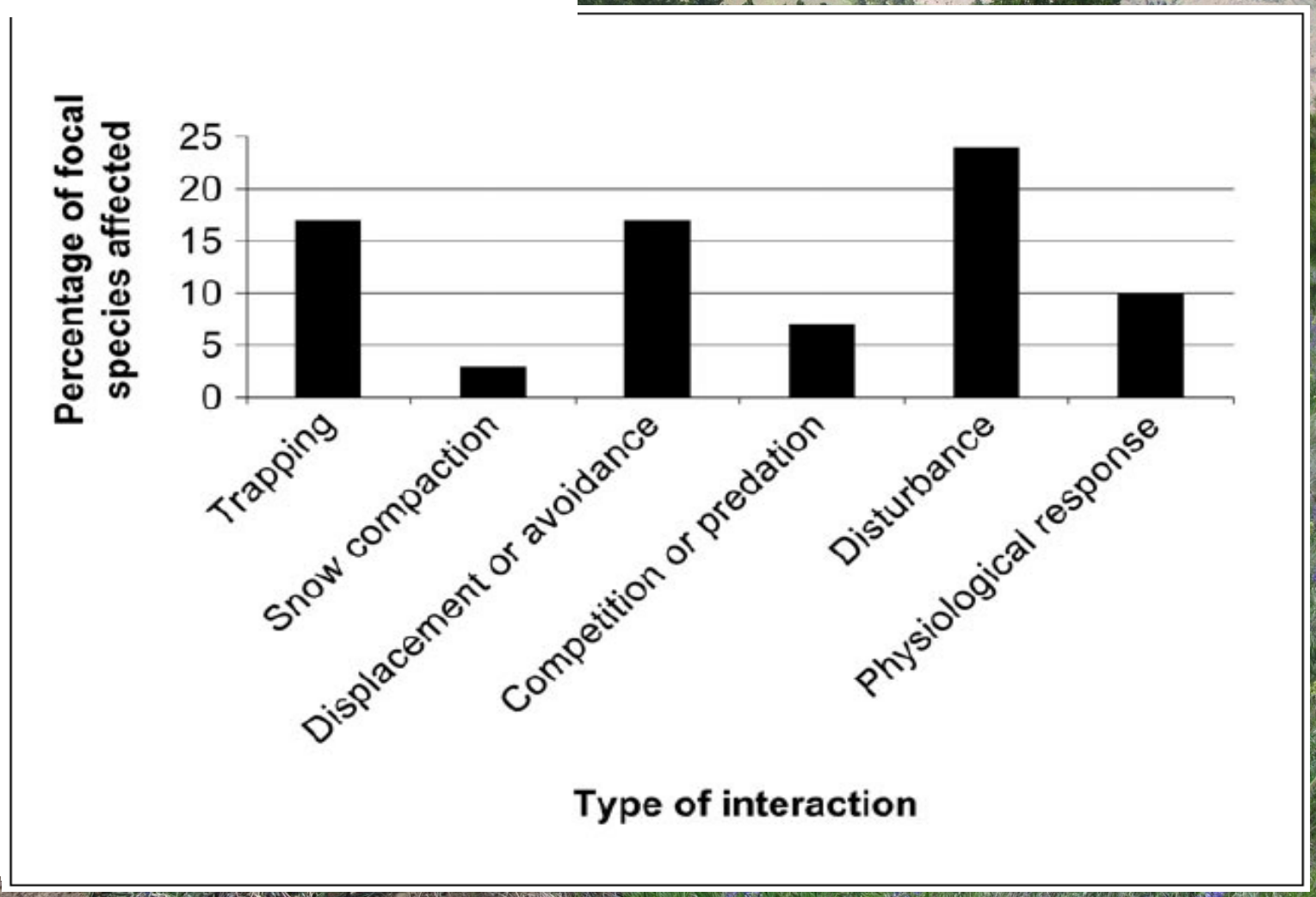
- Movement/Dispersal interference
- Direct and Indirect Fragmentation
- Reduction of Habitat
- Changes in Edge Effect
- Change in Pred/Competition Access

Disturbance

- Displacement/Avoidance
- Stress Hormones
- Rearing of young sites
- Reduced Foraging

Consensus of the Available Literature

Ski Trail Literature



Recreational Management Discussions for Wildlife Avoidance/Disturbance

- Current management recommendation:
  - Road/Trail Density Thresholds
  - Buffer Distances

Species Specific Recreational System Reviews using Buffers or Road Density

Buffers

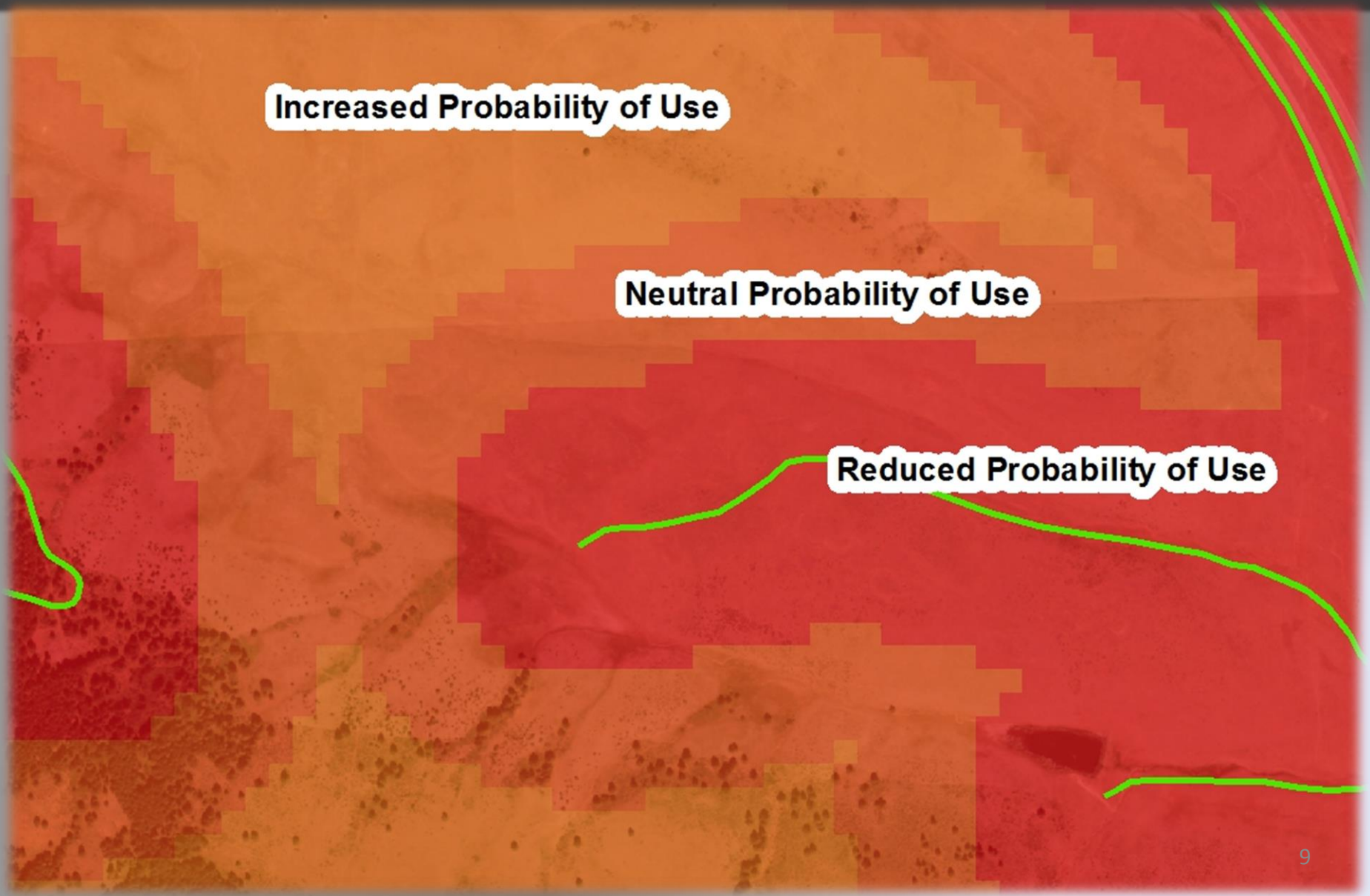
- **Elk**
- **Deer**
- Bighorn sheep
- Bears
- Mt. Goats
- **Spotted owls**
- **Northern Goshawks**
- Brown creepers
- **Pygmy nuthatch**
- White-breasted nuthatch
- Golden Eagle
- **Riparian habitat influence**
- **White-headed woodpecker**
- Three-toed woodpecker
- **Pileated woodpecker**

Road Density Thresholds

- Wolves
- Lynx
- Wolverines
- Water shrew
- **Riparian habitat route density**

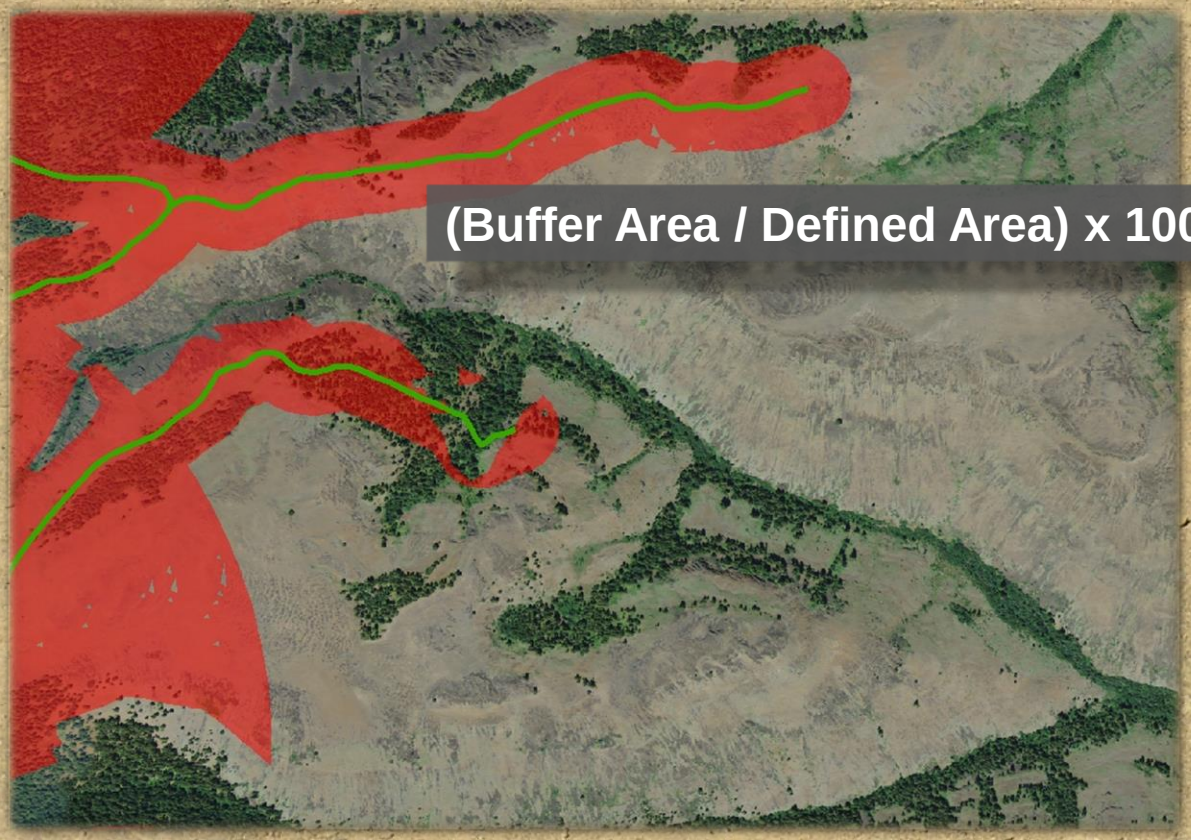
01/12/2015 15:23

Understanding Buffer Distances



Buffer Model Output

- **Zone of Influence:** percentage of a landscape that is affected by human disturbance for a given species

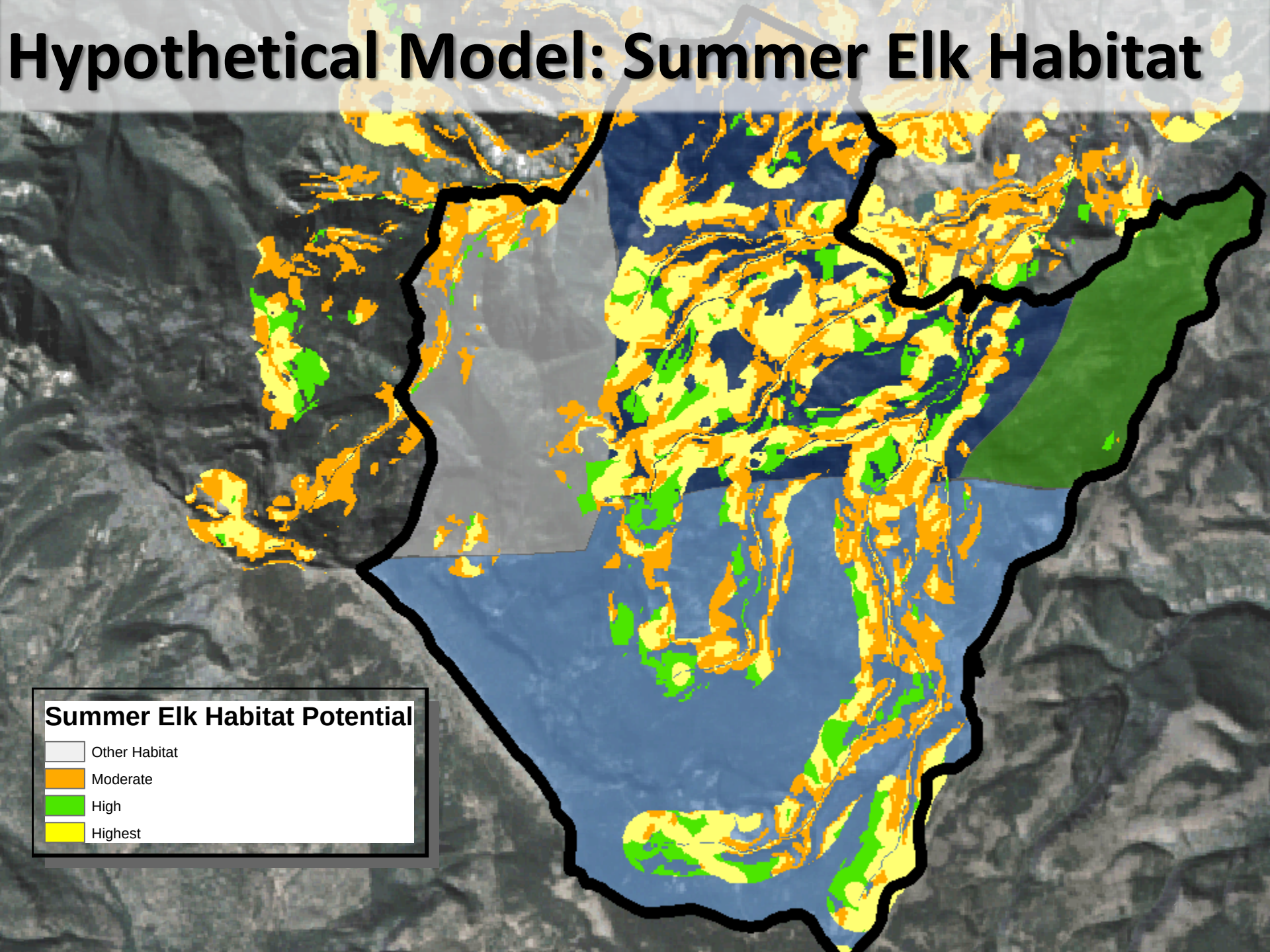


(Buffer Area / Defined Area) x 100 = Zone of Influence

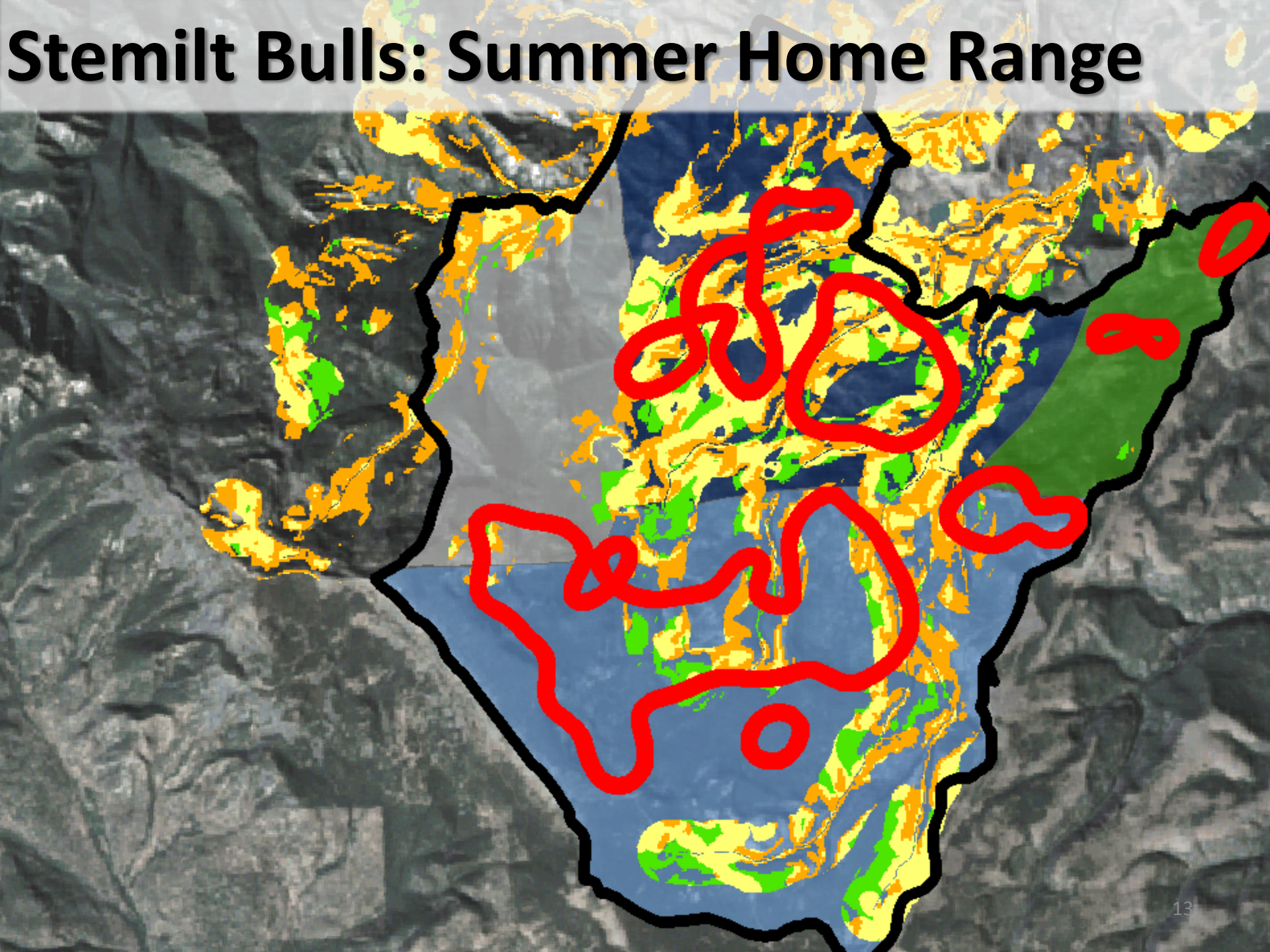
A Hypothetical Model for the Stemilt Basin

1. Define analysis area
2. Classify the recreation GIS data
3. Determine buffers for each rec activity
4. Account for any other variables
5. Calculate the **Zone of Influence**
6. *Model results for the current condition*
7. *Model results for recreation alternatives*

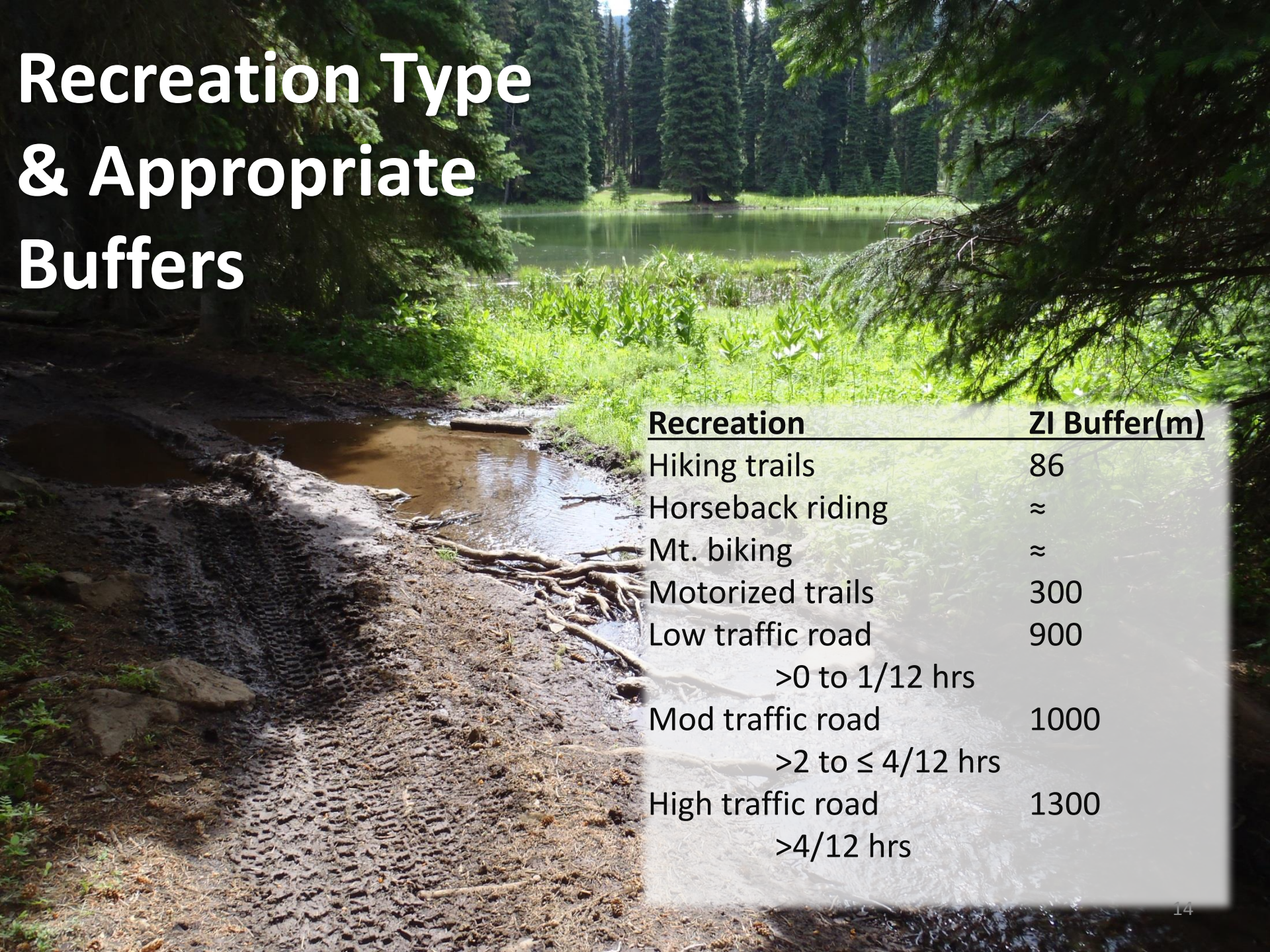
Hypothetical Model: Summer Elk Habitat



Stemilt Bulls: Summer Home Range

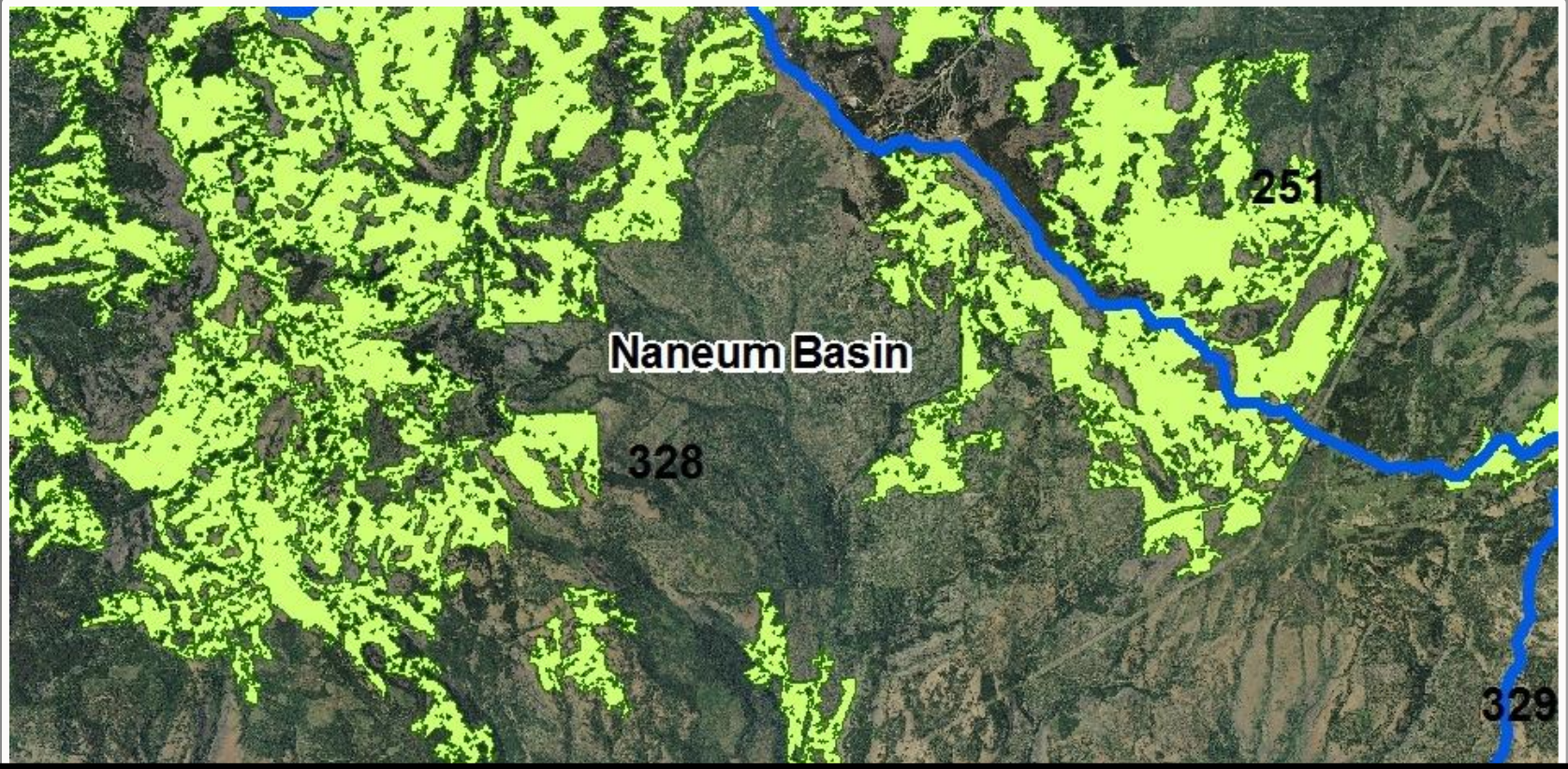


Recreation Type & Appropriate Buffers



Recreation	ZI Buffer(m)
Hiking trails	86
Horseback riding	≈
Mt. biking	≈
Motorized trails	300
Low traffic road >0 to 1/12 hrs	900
Mod traffic road >2 to ≤ 4/12 hrs	1000
High traffic road >4/12 hrs	1300

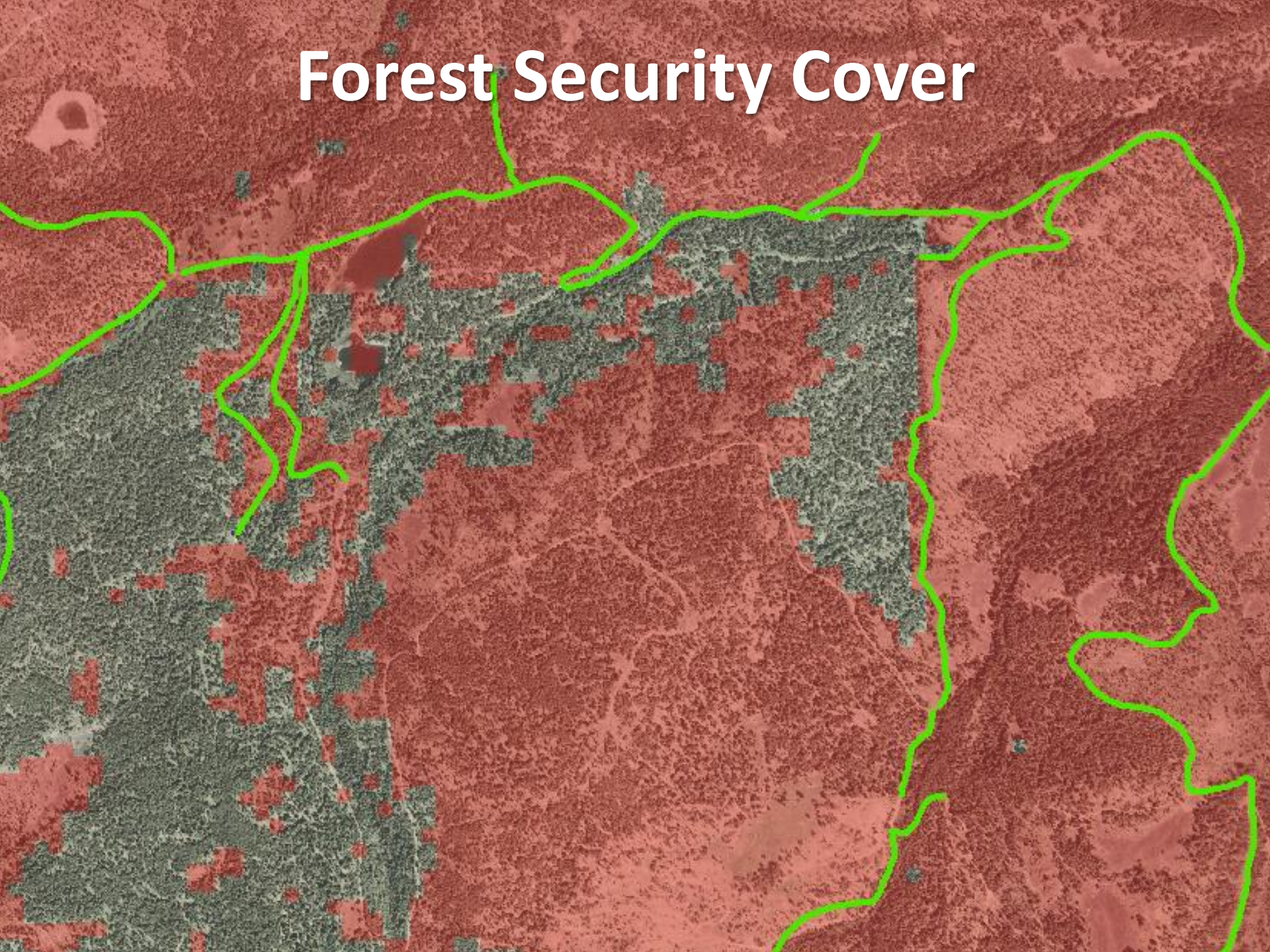
Forest Security Cover



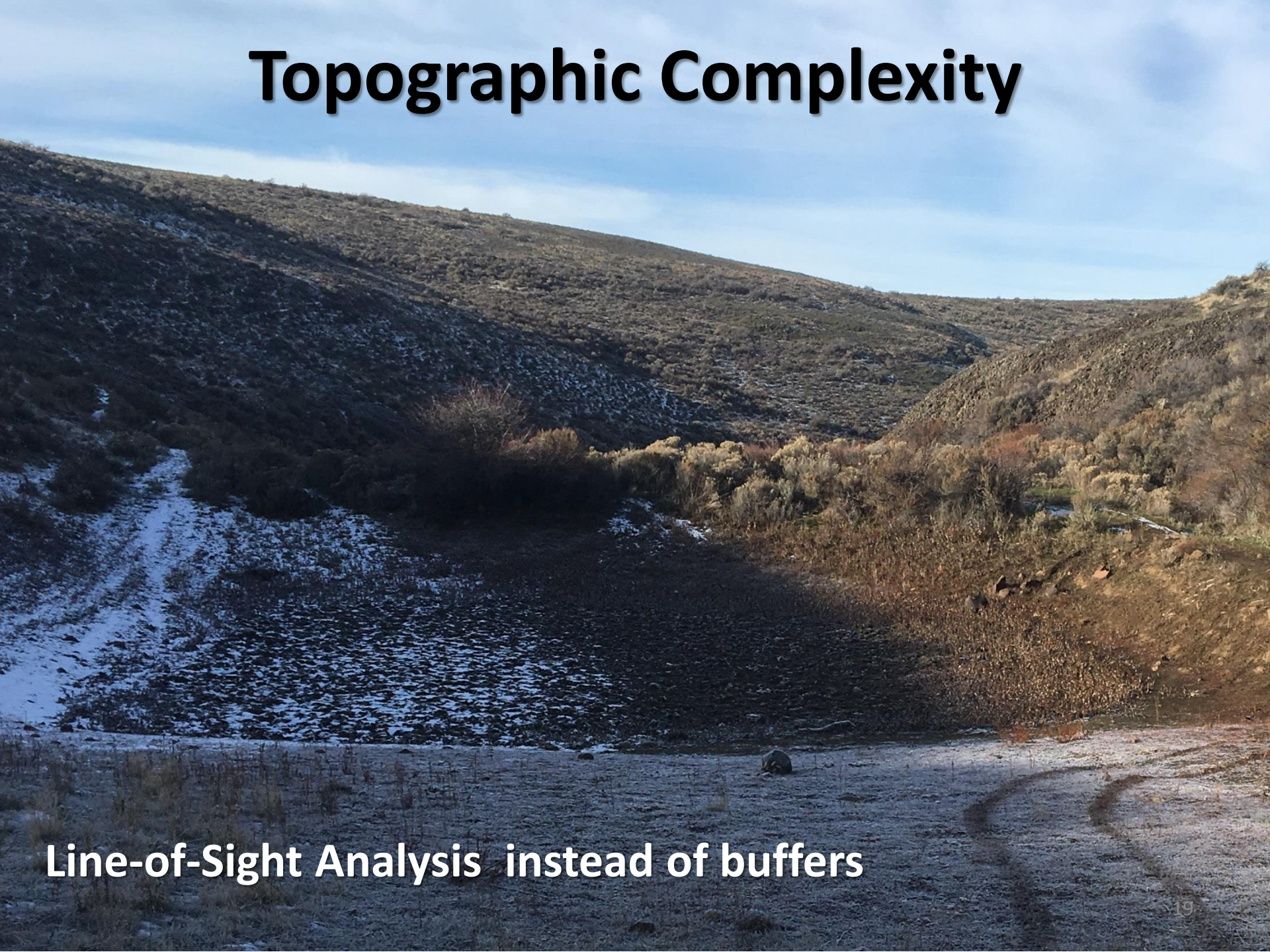
Elk Security Cover:

All conifer stands of >70% canopy cover and > 250 acres were excluded from the zone of influence

Forest Security Cover

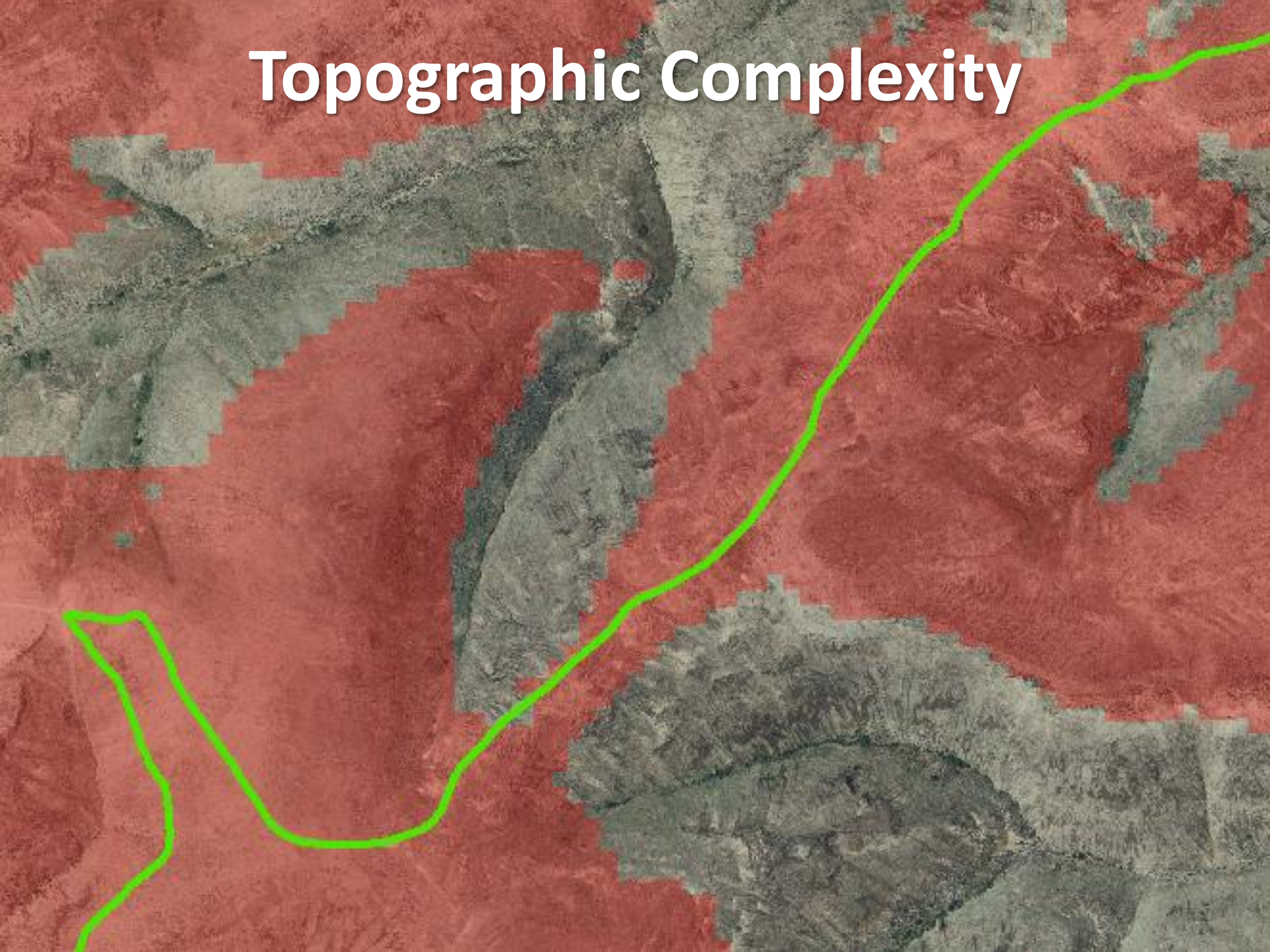


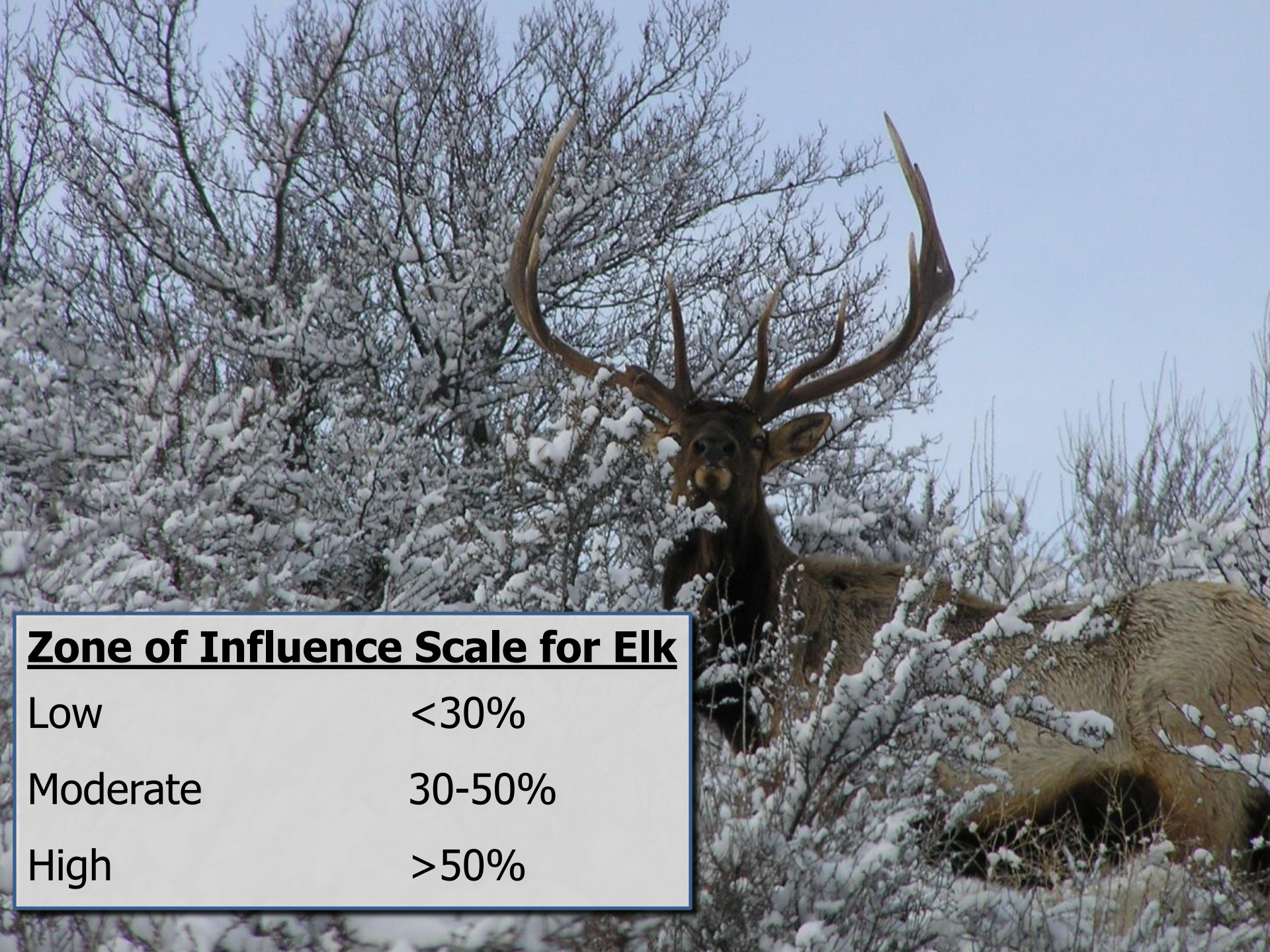
Topographic Complexity



Line-of-Sight Analysis instead of buffers

Topographic Complexity





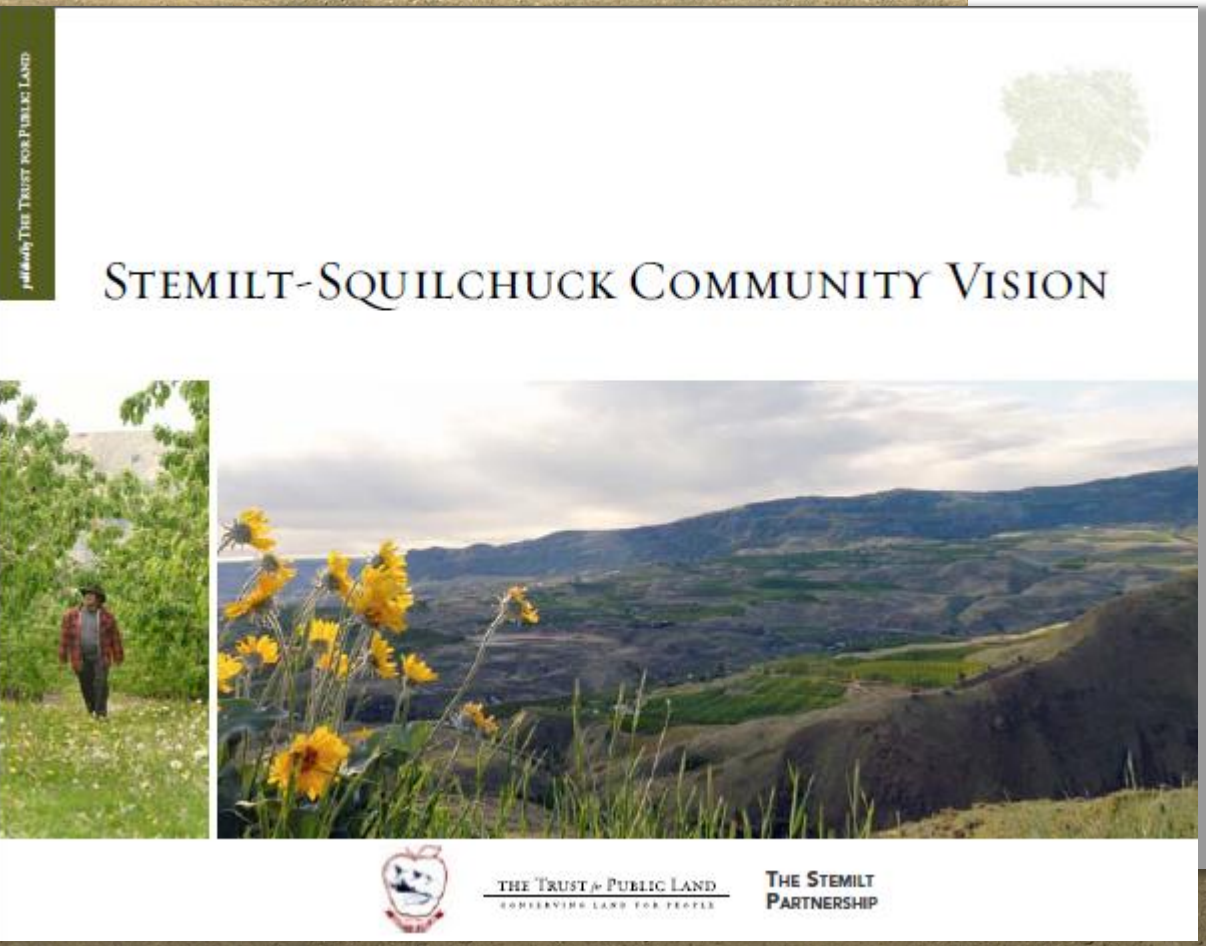
Zone of Influence Scale for Elk	
Low	<30%
Moderate	30-50%
High	>50%

Recreation Modeling Possibilities

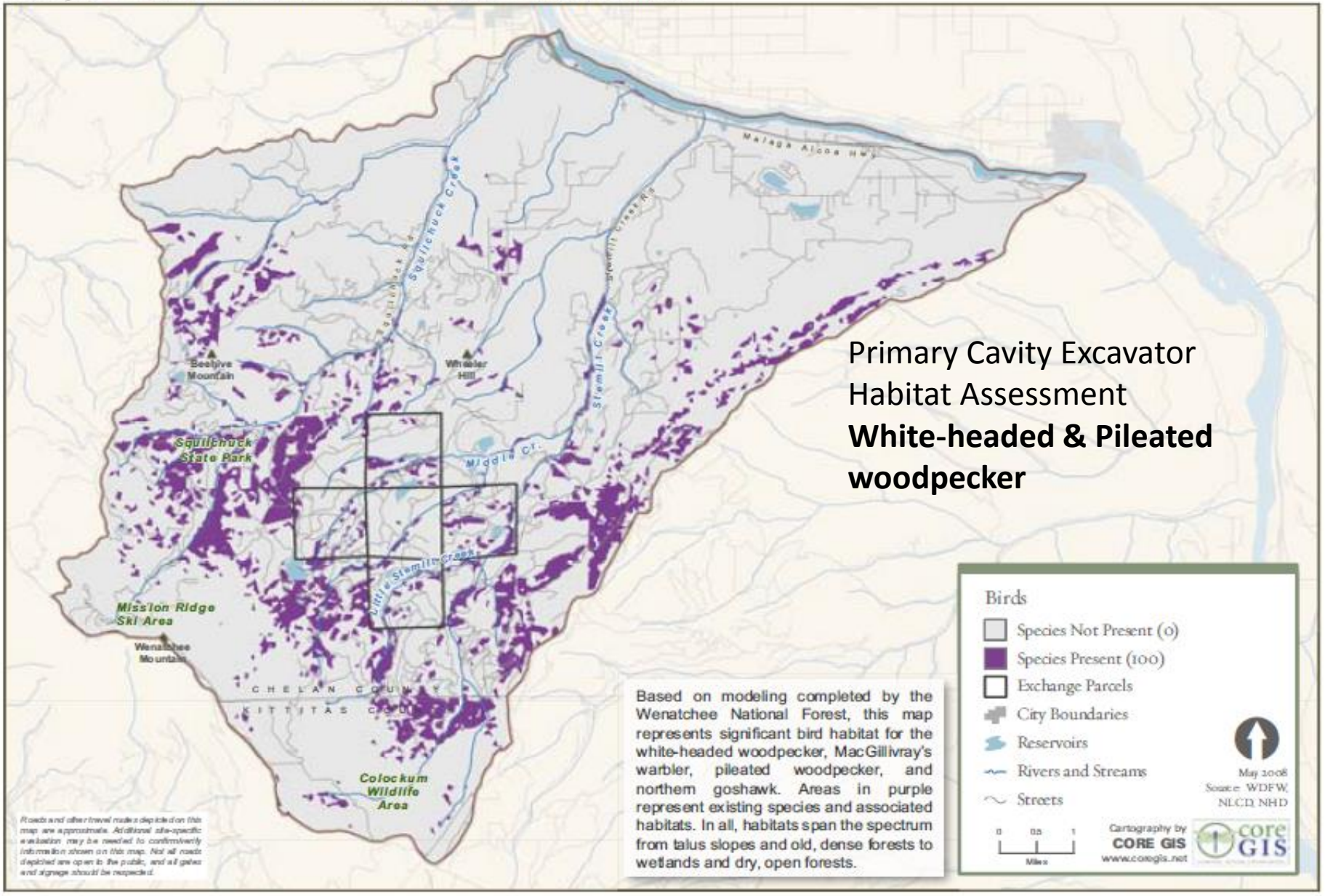
USDA United States Department of Agriculture
Forest Service
Pacific Northwest Research Station
General Technical Report PNW-GTR-586
November 2003

Assessing the Cumulative Effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests

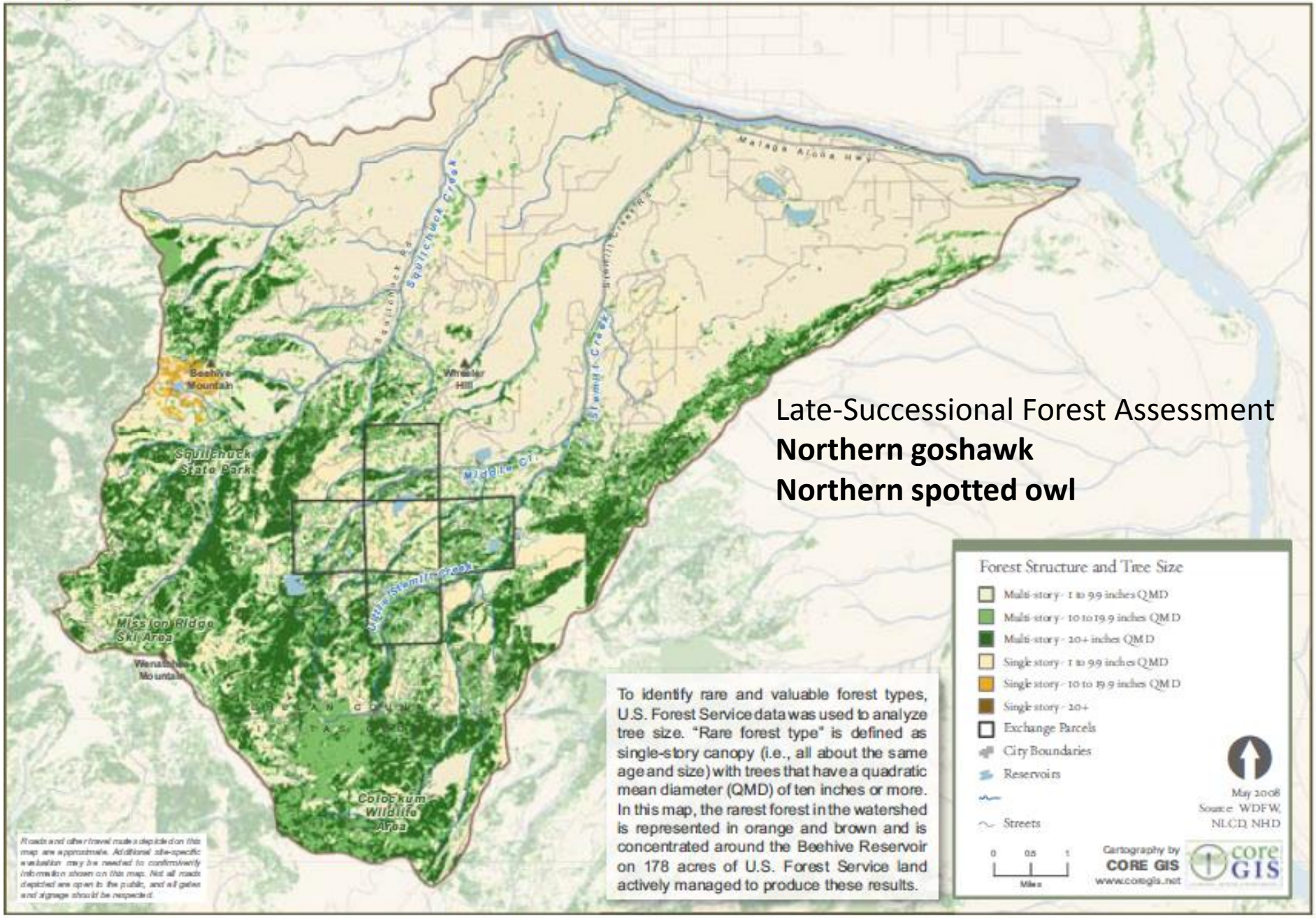
William L. Gaines, Peter H. Singleton, and Roger C. Ross



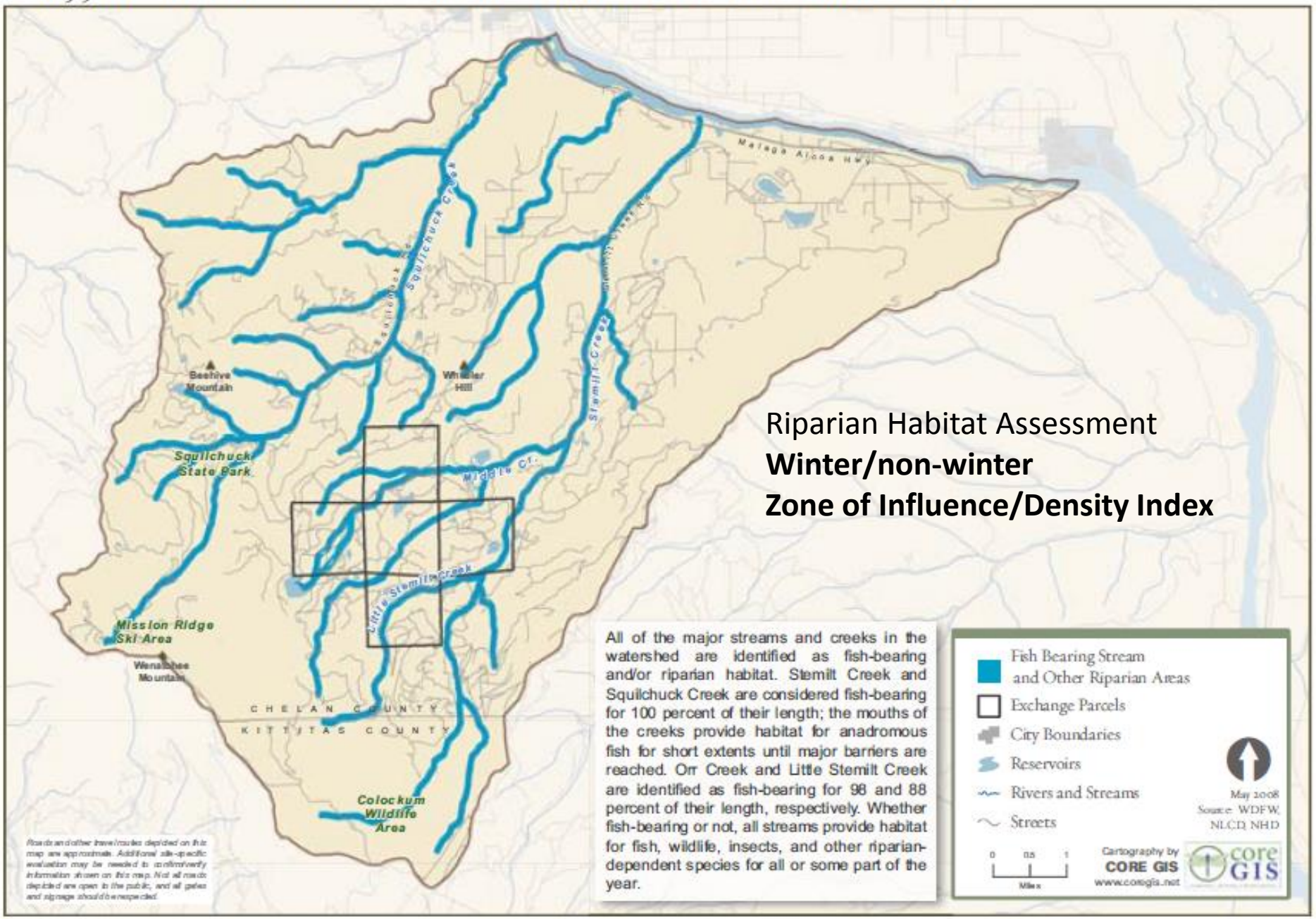
Map 5.8 Wildlife Resources: Significant Bird Habitat

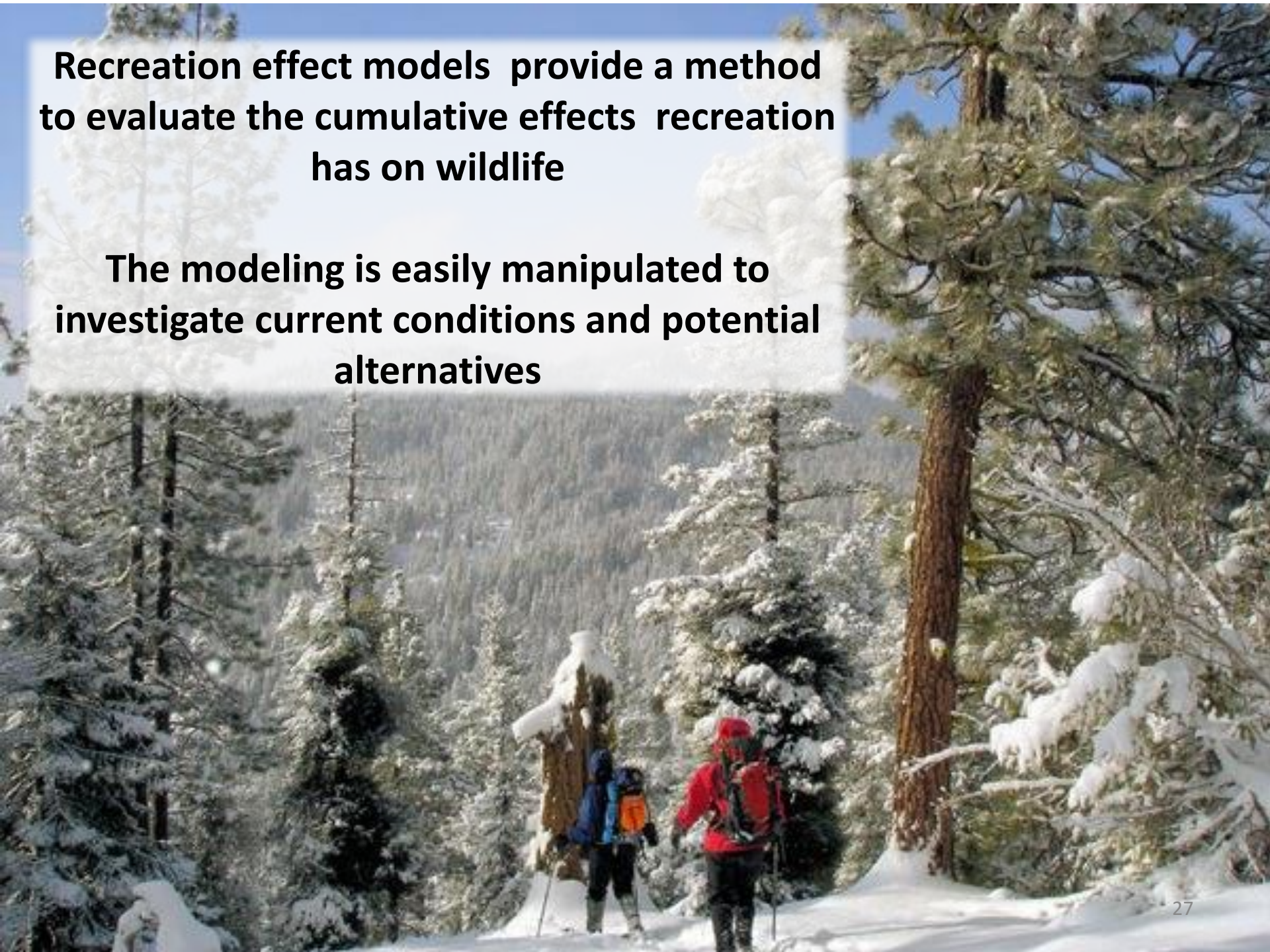


Map 5.10 Wildlife Resources: Forest Structure and Tree Size



Map 5.9 Wildlife Resources: Fish-bearing Streams and Other Riparian Areas





Recreation effect models provide a method to evaluate the cumulative effects recreation has on wildlife

The modeling is easily manipulated to investigate current conditions and potential alternatives