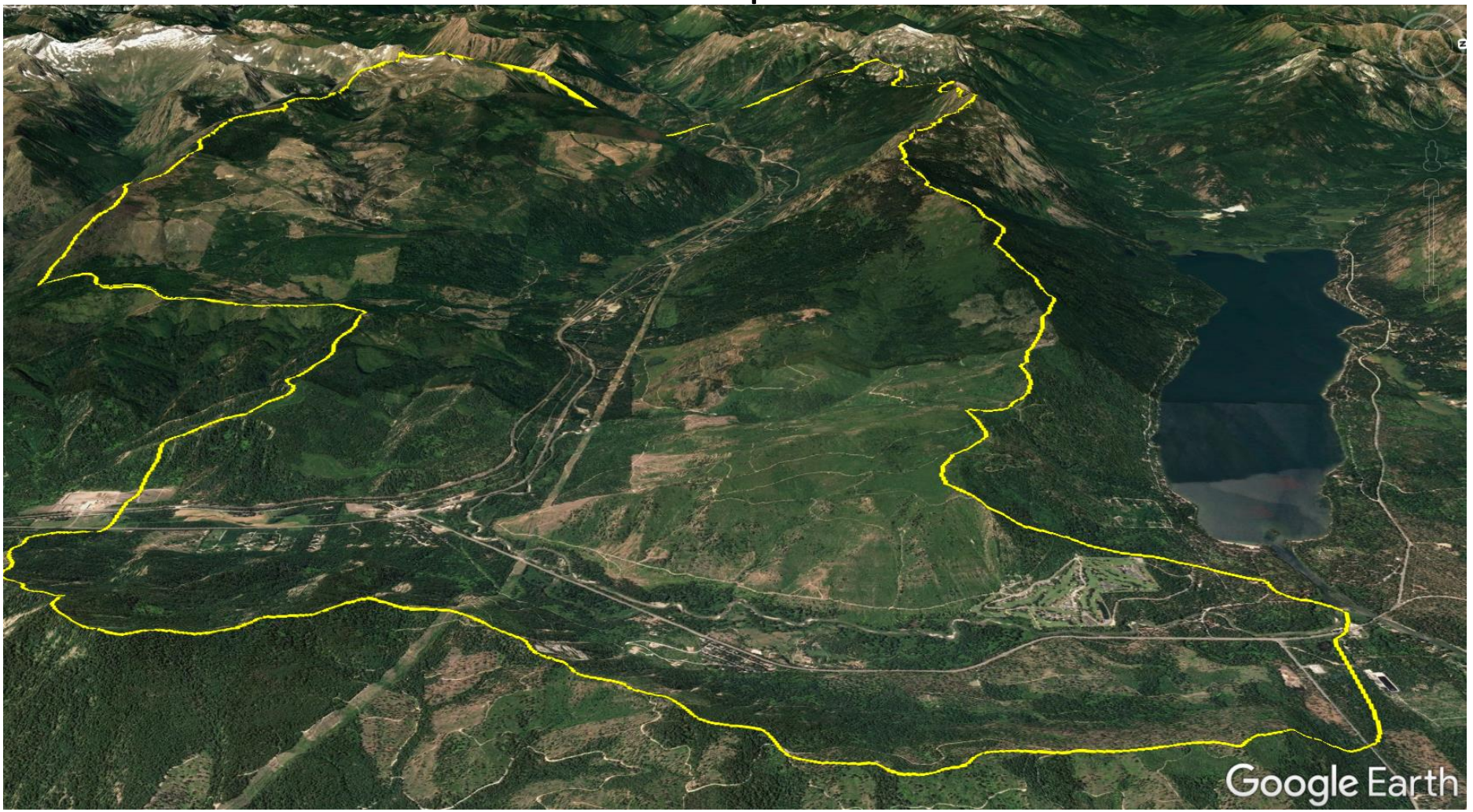
Nason Creek

Draft Landscape Evaluation



Derek Churchill
WA DNR Forest Health & Resiliency Division
April 30, 2020

20-YEAR FOREST HEALTH STRATEGIC PLAN

EASTERN WASHINGTON

WASHINGTON STATE DEPT OF NATURAL RESOURCES
HILARY S. FRANZ
COMMISSIONER OF PUBLIC LANDS

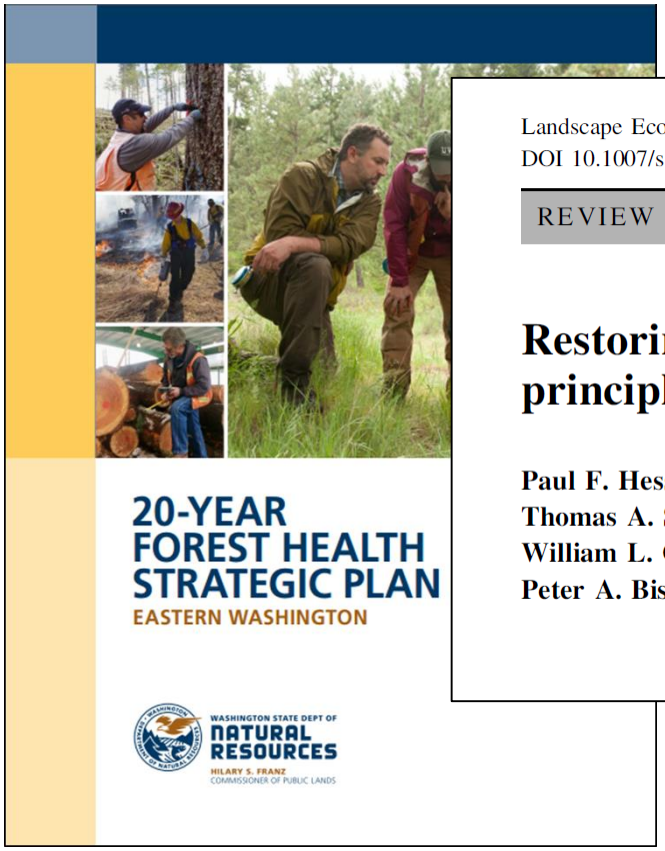
WASHINGTON STATE WILDLAND FIRE PROTECTION 10-YEAR STRATEGIC PLAN

SOLUTIONS FOR A PREPARED, SAFE, RESILIENT WASHINGTON

WASHINGTON STATE DEPT OF NATURAL RESOURCES
HILARY S. FRANZ
COMMISSIONER OF PUBLIC LANDS

Landscape Evaluations

- **Scientific foundation of 20 Year Plan**



Landscape Ecol
DOI 10.1007/s10980-015-0218-0

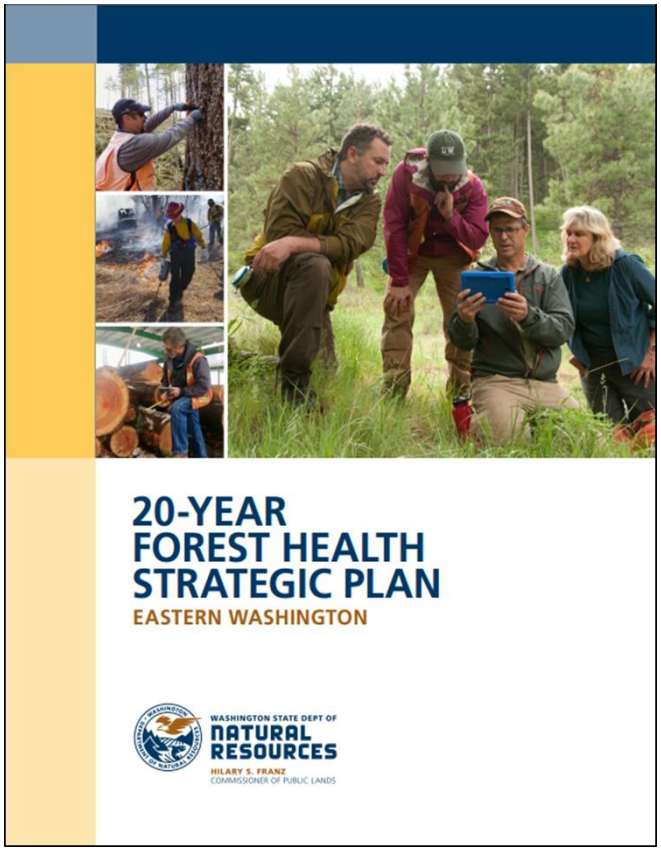
CrossMark

REVIEW ARTICLE

Restoring fire-prone Inland Pacific landscapes: seven core principles

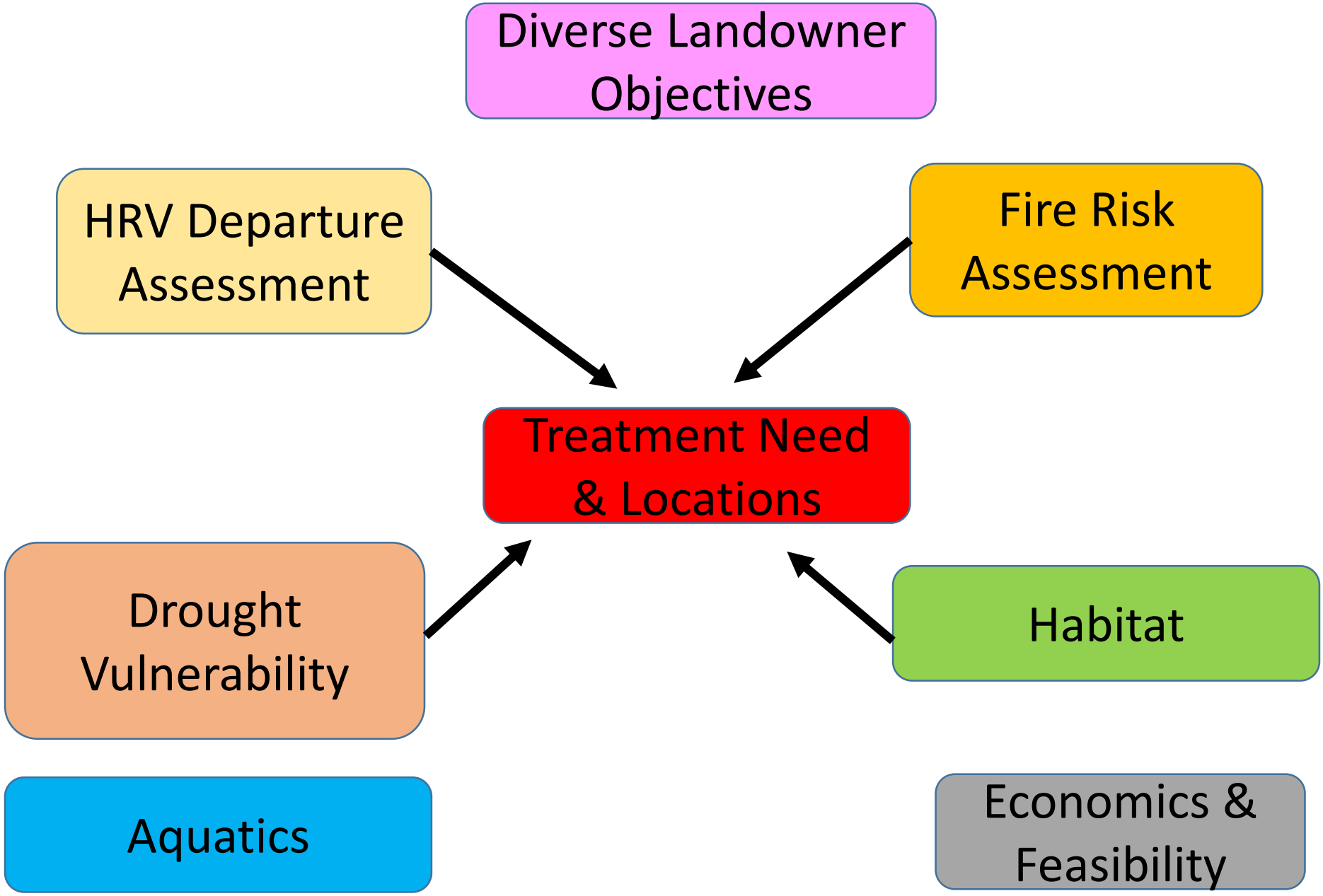
Paul F. Hessburg · Derek J. Churchill · Andrew J. Larson · Ryan D. Haugo · Carol Miller · Thomas A. Spies · Malcolm P. North · Nicholas A. Povak · R. Travis Belote · Peter H. Singleton · William L. Gaines · Robert E. Keane · Gregory H. Aplet · Scott L. Stephens · Penelope Morgan · Peter A. Bisson · Bruce E. Rieman · R. Brion Salter · Gordon H. Reeves

Landscape Evaluations

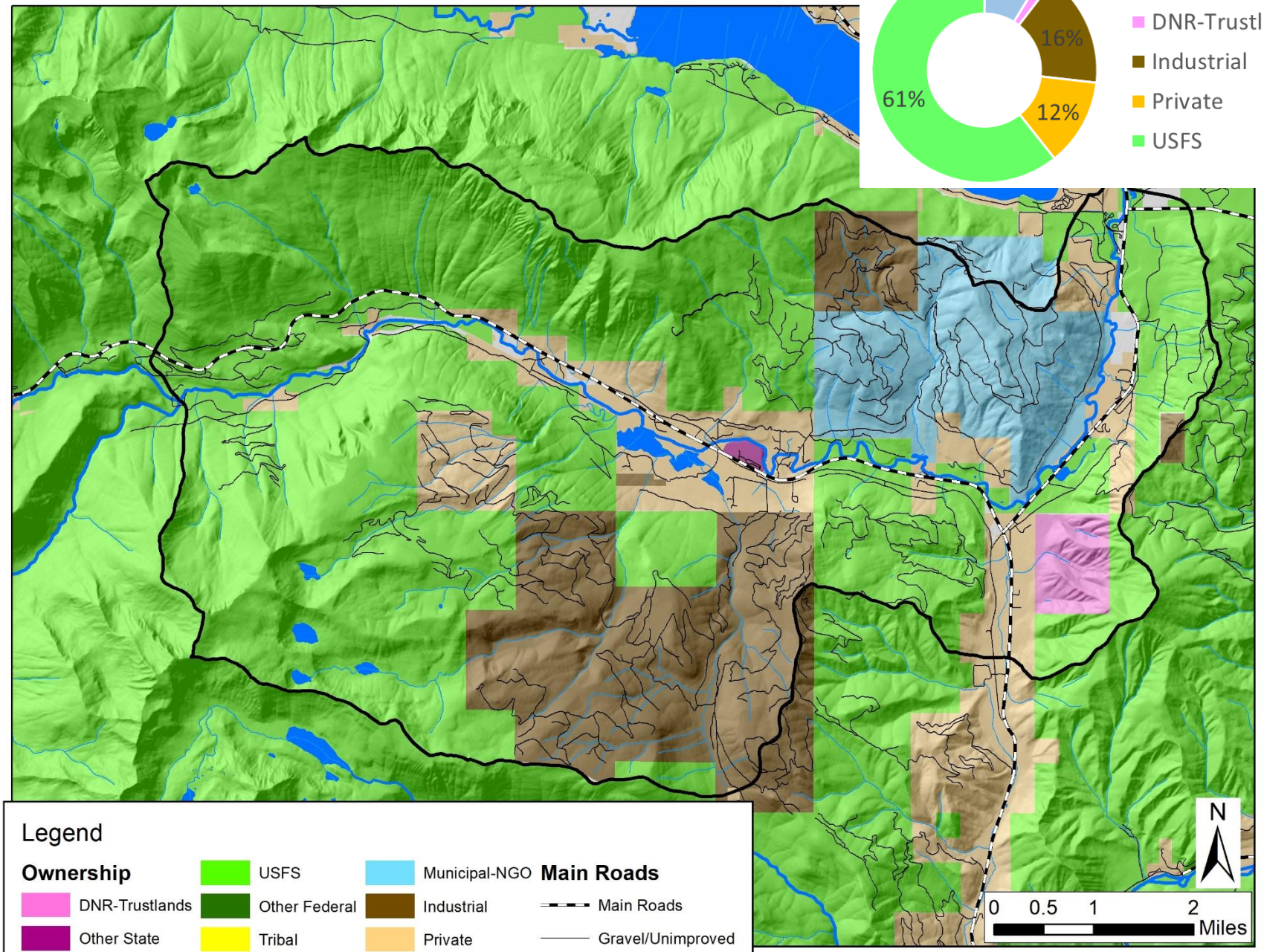


- **Scientific foundation of 20 Year Plan**
- **All lands approach**
- **Role of DNR: coordinating landowners**
- **Estimate Treatment Need & Prioritize general locations for treatment**
- **Recommendations ➔ Landowners conduct their own planning & implementation**
- **Basis for future funding requests**
- **Basis of consensus & social license**

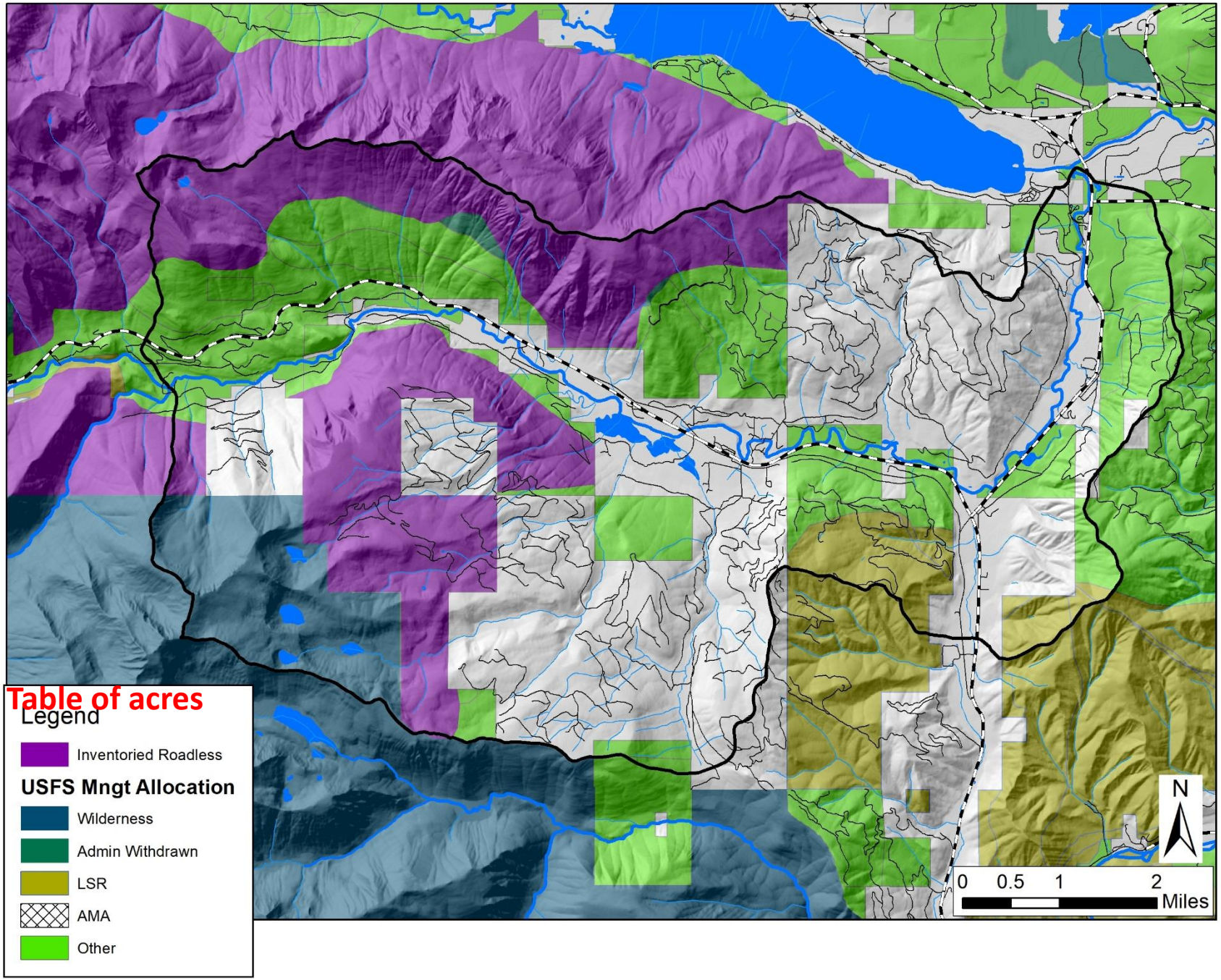
Landscape Evaluations & Prescriptions



OWNERSHIP

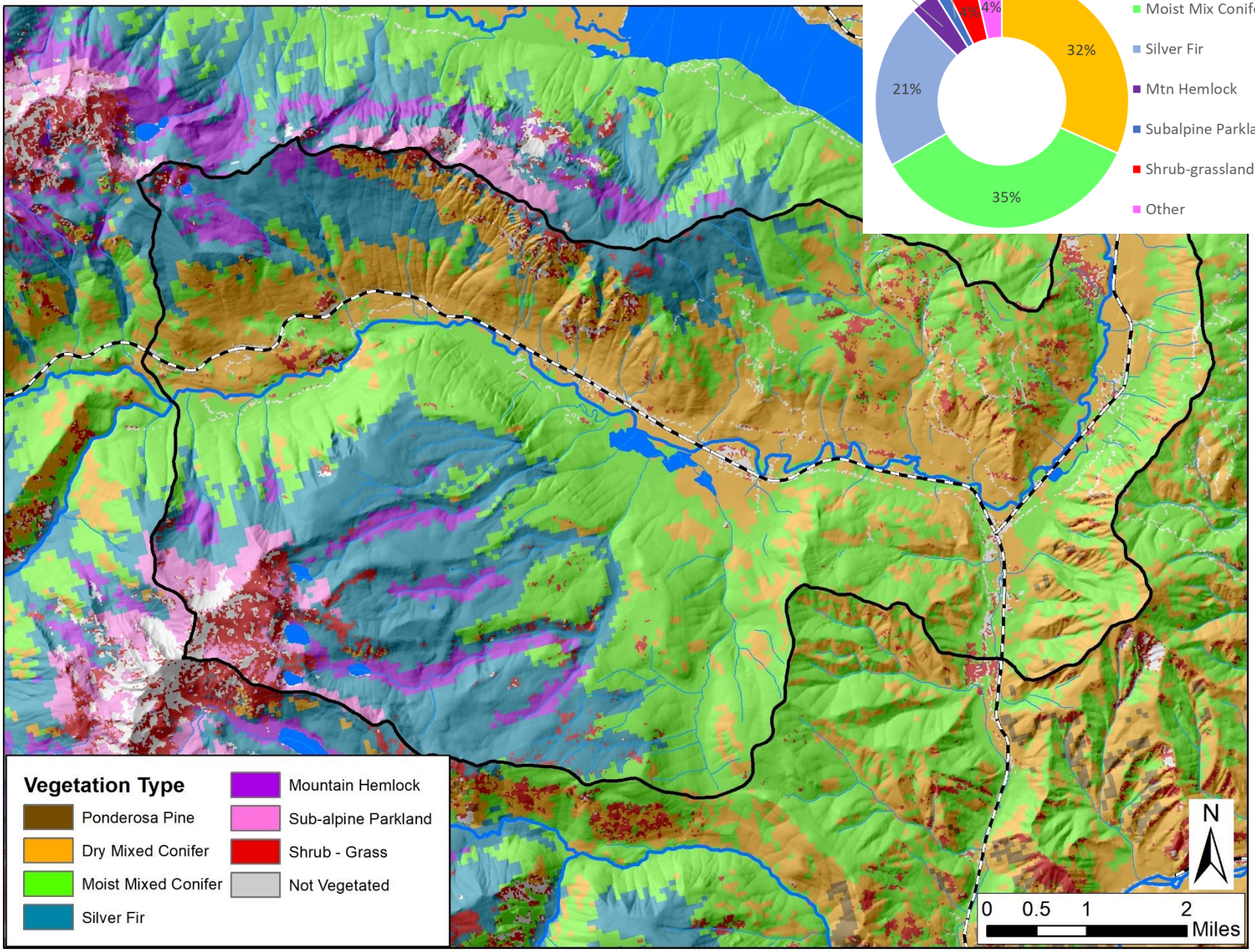

2%
9%
16%
61%
12%
City-County
DNR-Trustlands
Industrial
Private
USFS
Legend
Ownership
DNR-Trustlands
Other State
USFS
Other Federal
Tribal
Municipal-NGO
Industrial
Private
Main Roads
Main Roads
Gravel/Unimproved
Closed
N
0 0.5 1 2
Miles

MANAGEMENT ALLOCATION



➢ **Table of acres**

POTENTIAL VEGETATION GROUP



Departure Assessment

Photo-interpretation (PI) to compare current conditions to historical reference condition

USDA

United States Department of Agriculture

Forest Service

Pacific Northwest Region

The Okanogan-Wenatchee National Forest Restoration Strategy: adaptive ecosystem management to restore landscape resiliency

2012 Version

Okanogan-Wenatchee National Forest

November 2012

es and Records Administration

2011 Image by John F Marshall.
Okanogan-Wenatchee National Forest
Wenatchee Forestryi Sciences Lab

Landscape Ecol
DOI 10.1007/s10980-015-0218-0

CrossMark

REVIEW ARTICLE

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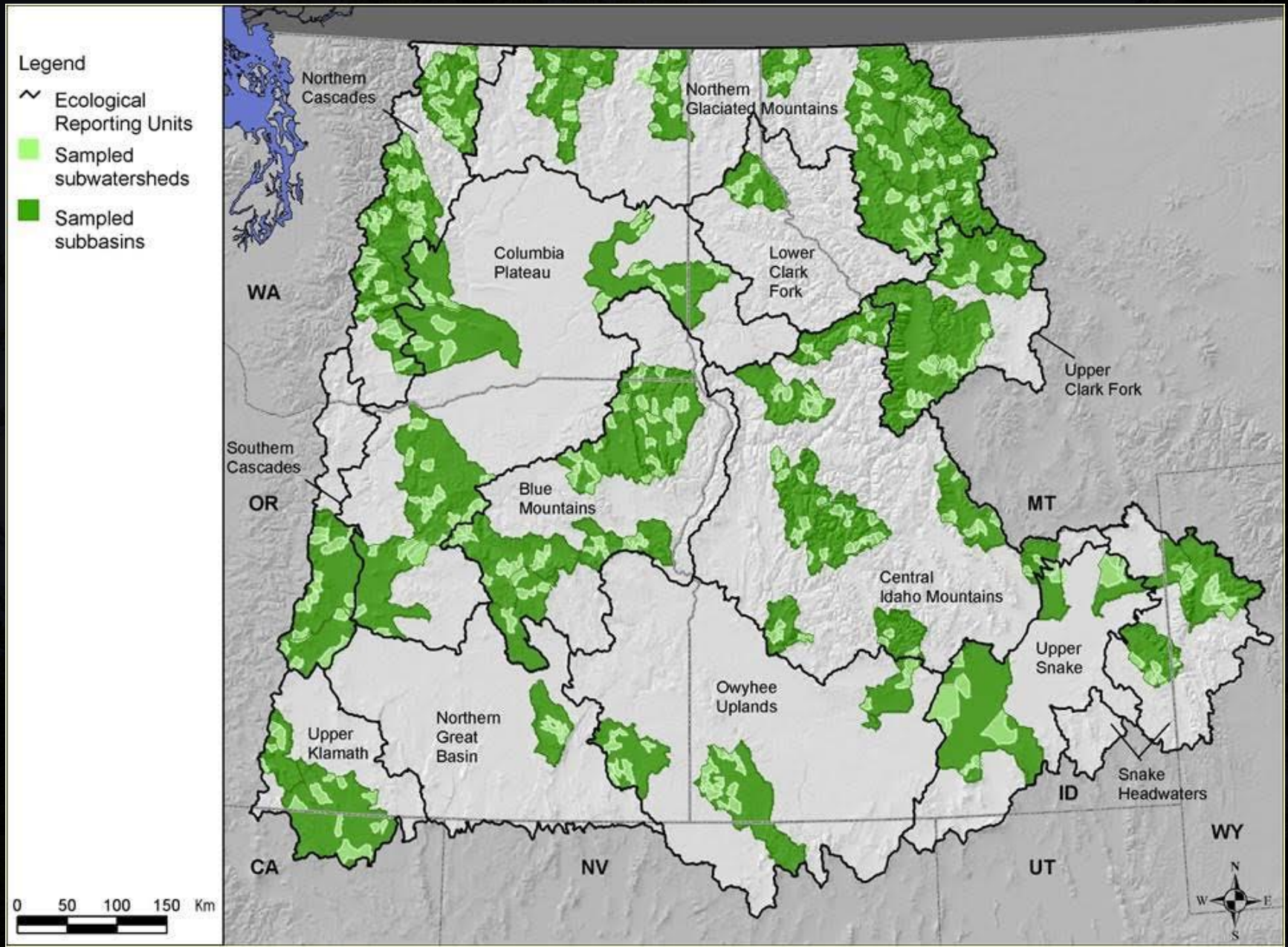
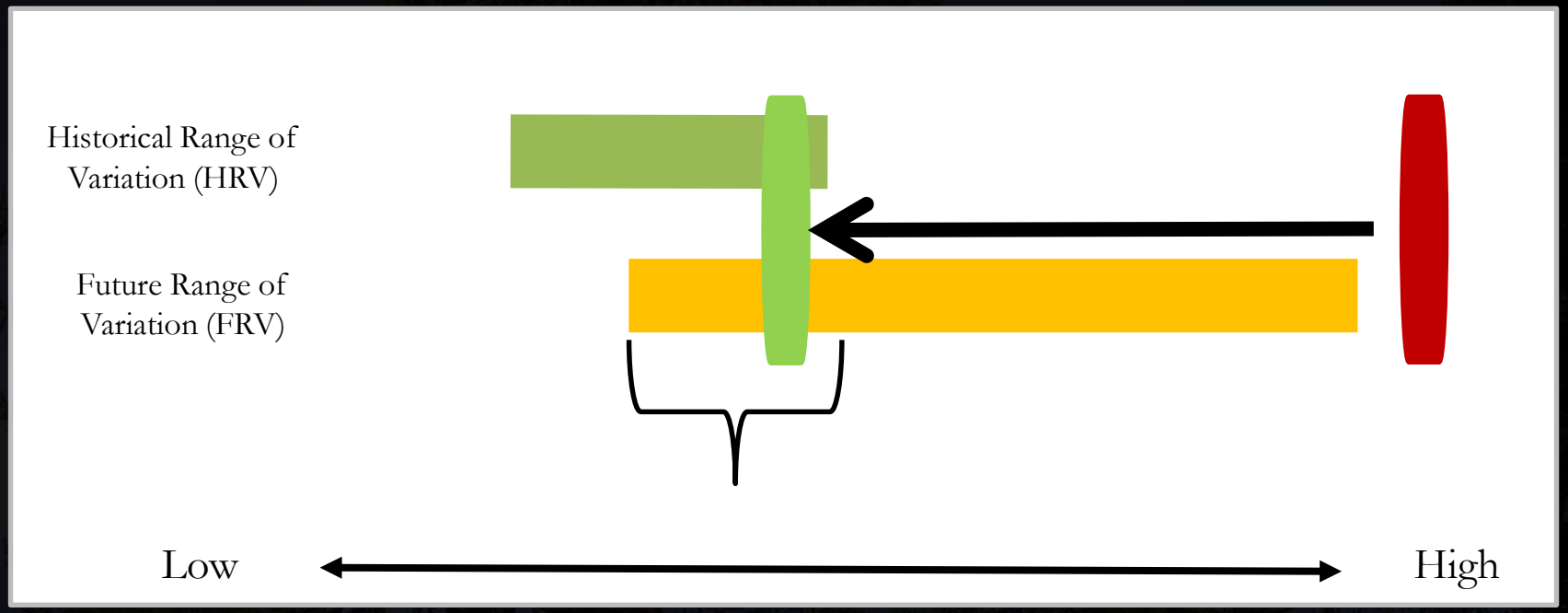
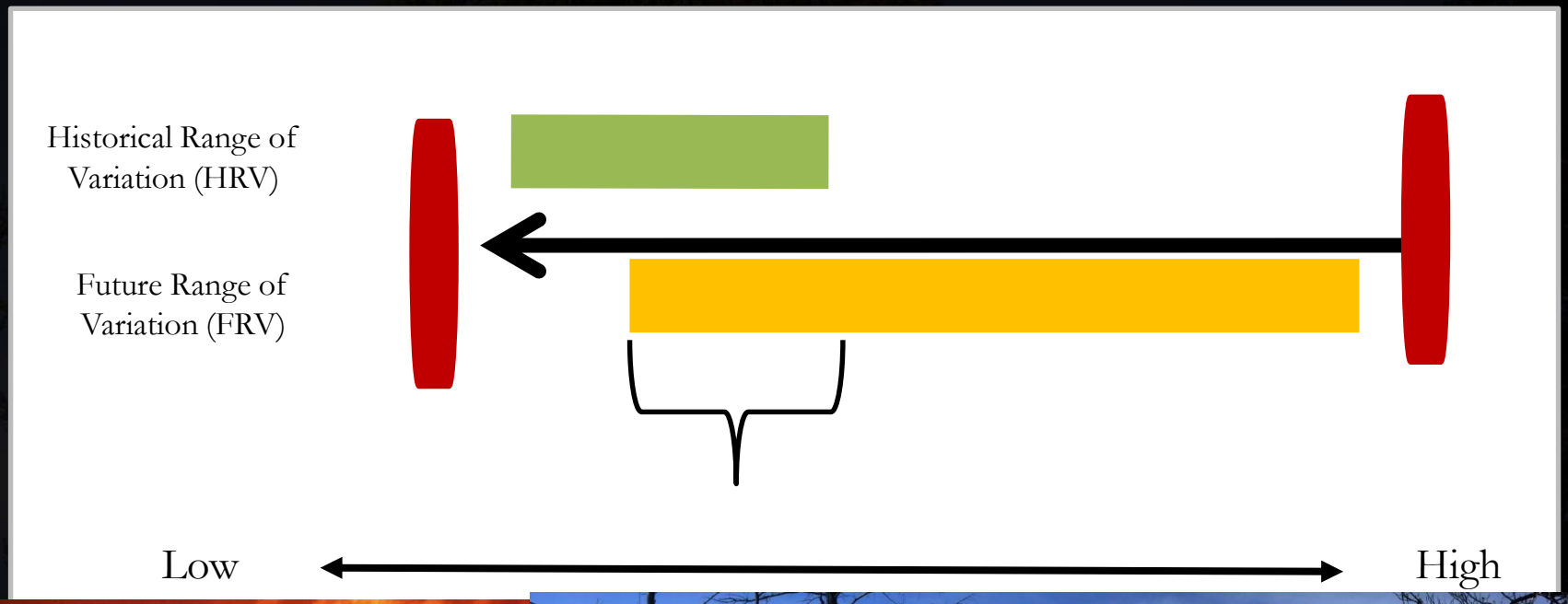
Reference Data



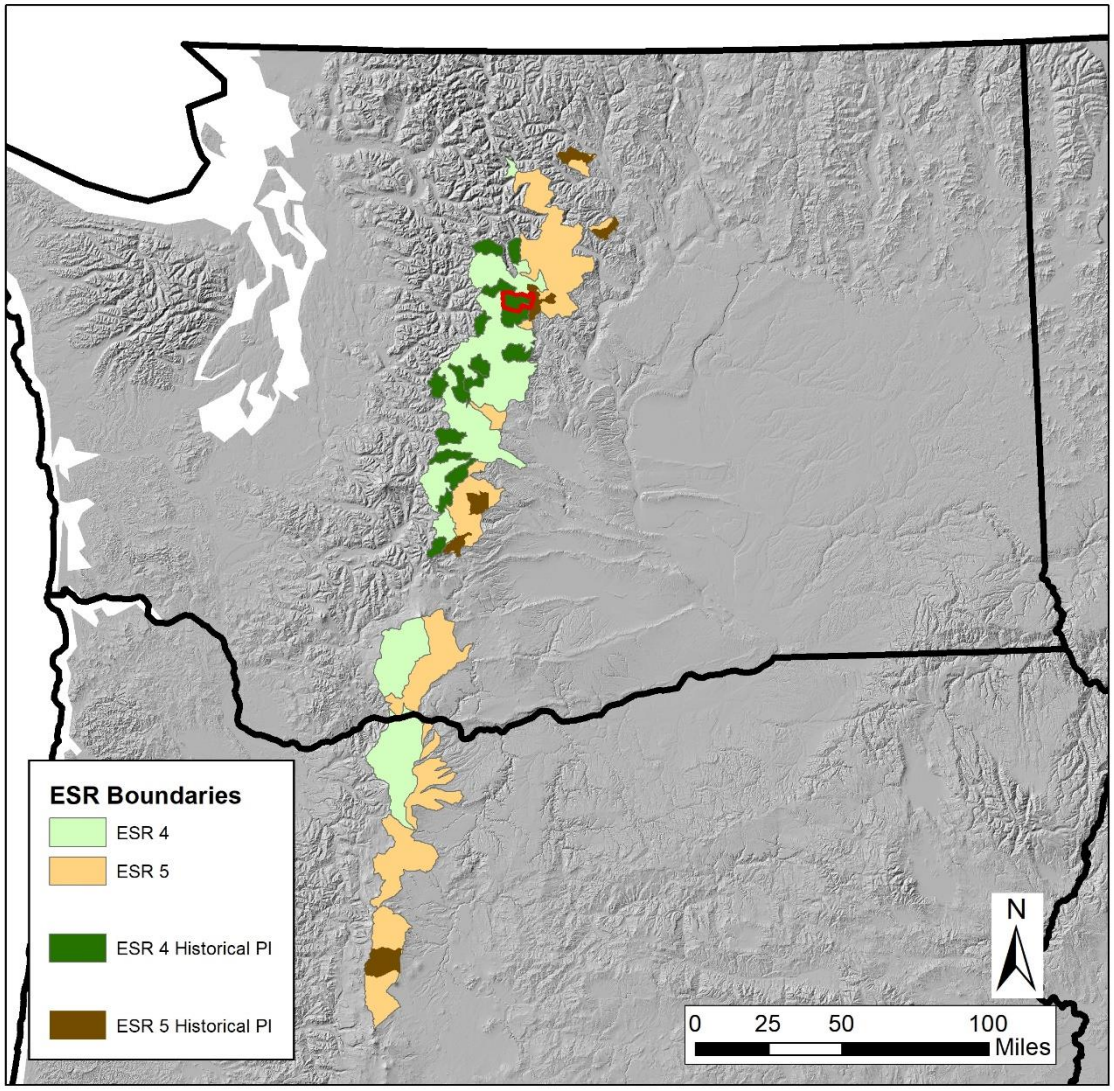
Reference Conditions and Management Targets



Reference Conditions and Management Targets



Historical & Future of Variability Source



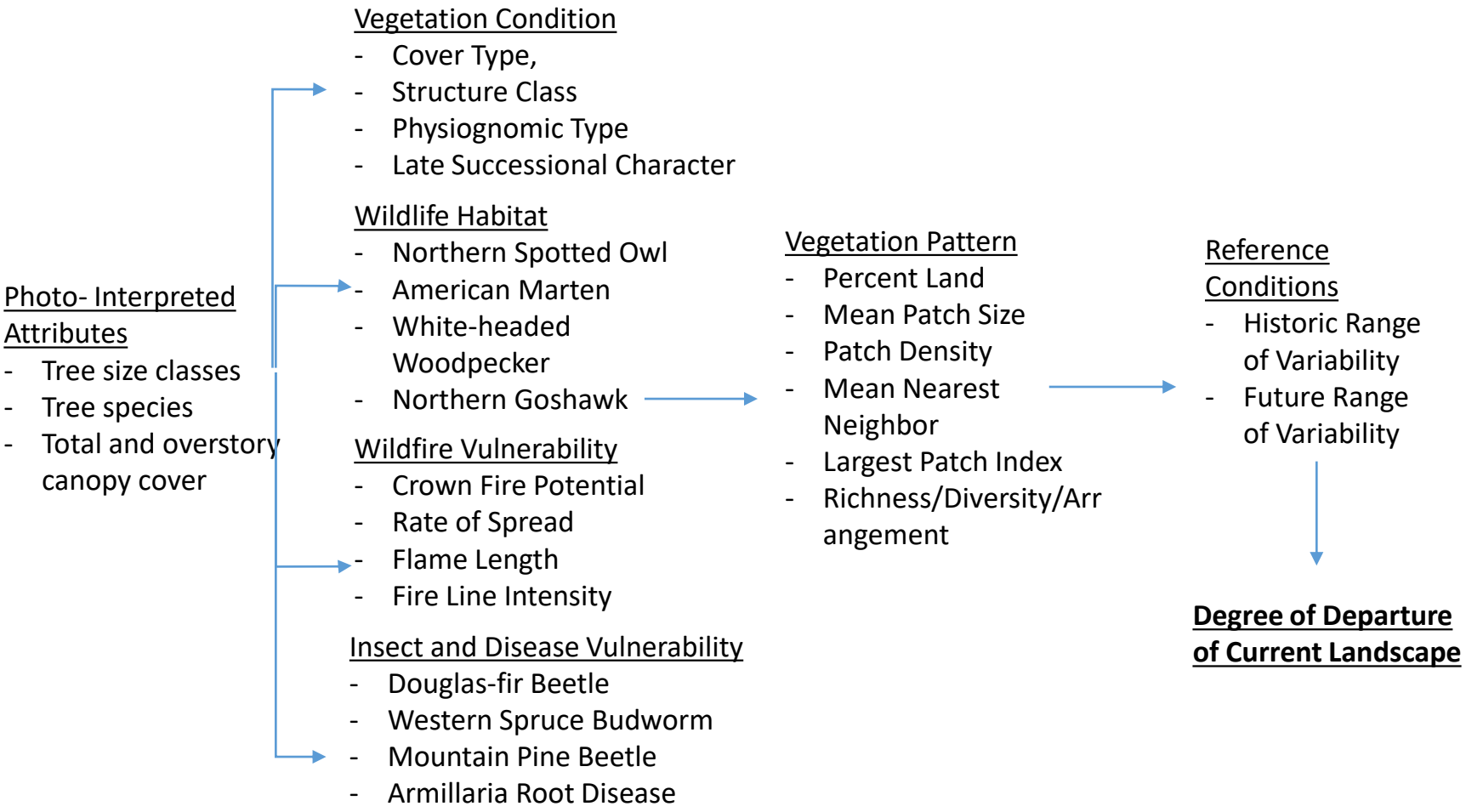
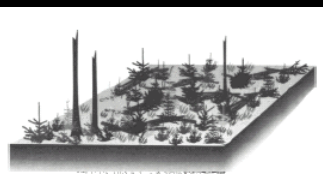


Photo- Interpreted Attributes
- Tree size classes
- Tree species
- Total and overstory canopy cover
Vegetation Condition
- Cover Type,
- Structure Class
- Physiognomic Type
- Late Successional Character
Wildlife Habitat
- Northern Spotted Owl
- American Marten
- White-headed Woodpecker
- Northern Goshawk
Wildfire Vulnerability
- Crown Fire Potential
- Rate of Spread
- Flame Length
- Fire Line Intensity
Insect and Disease Vulnerability
- Douglas-fir Beetle
- Western Spruce Budworm
- Mountain Pine Beetle
- Armillaria Root Disease
Vegetation Pattern
- Percent Land
- Mean Patch Size
- Patch Density
- Mean Nearest Neighbor
- Largest Patch Index
- Richness/Diversity/Arrangement
Reference Conditions
- Historic Range of Variability
- Future Range of Variability
Degree of Departure of Current Landscape

Structural Classes



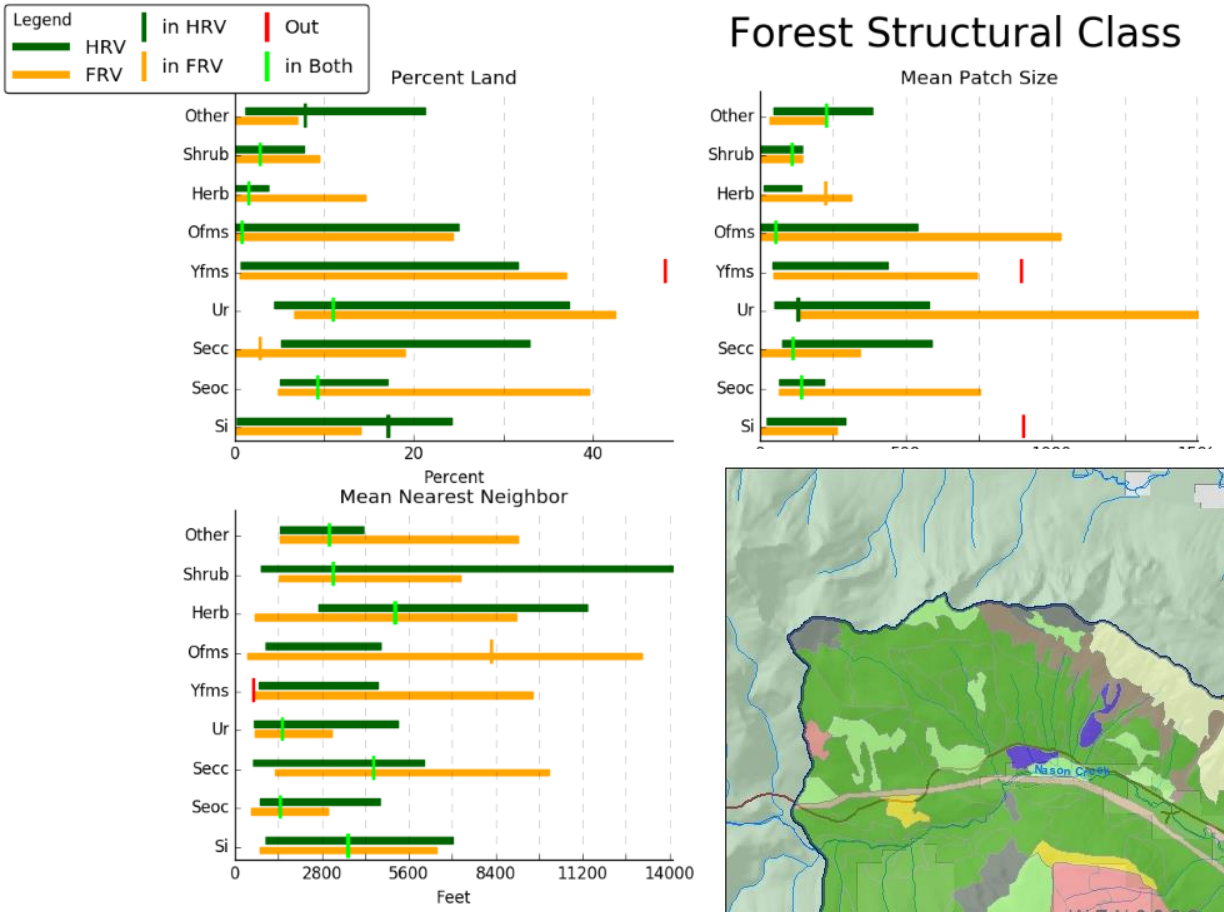
Stand Initiation

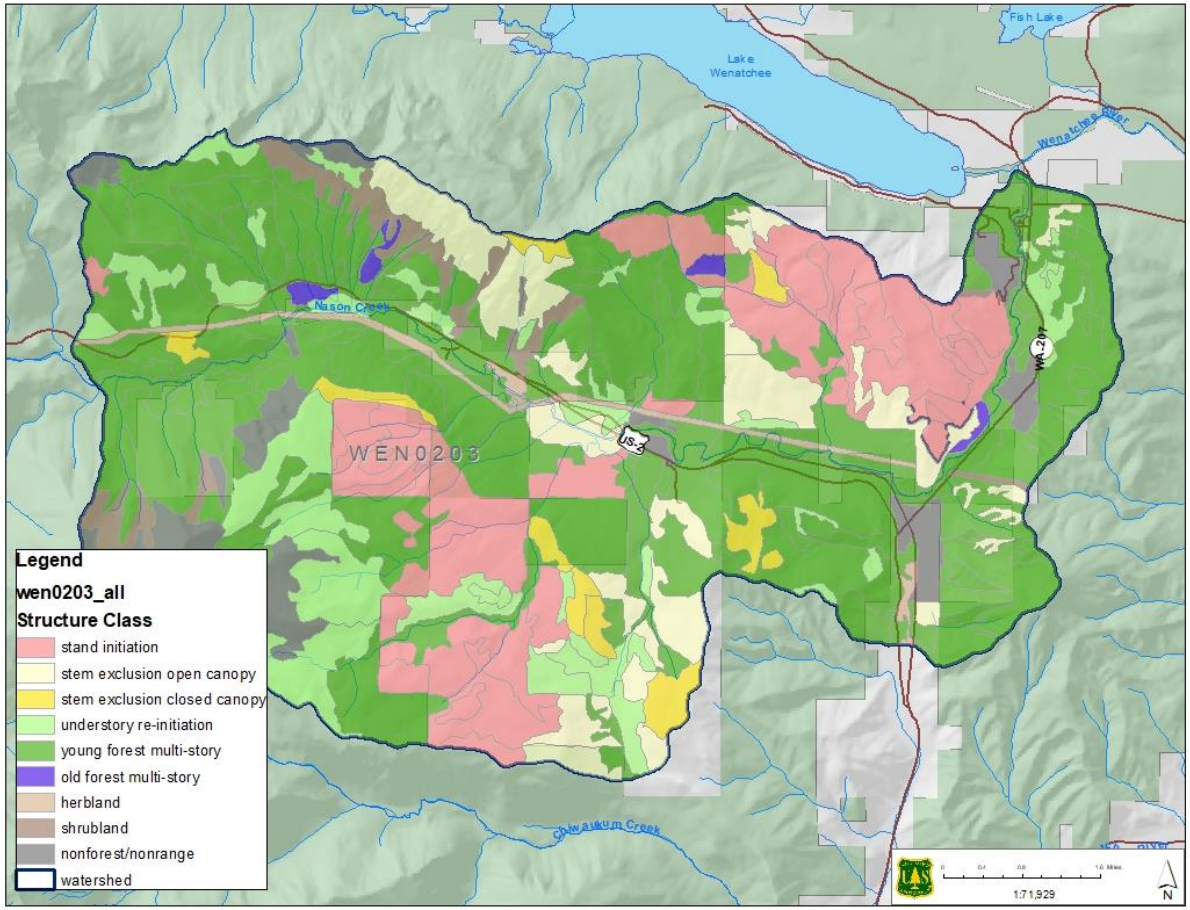
Young Forest Multistory

Old Forest Multi-Story

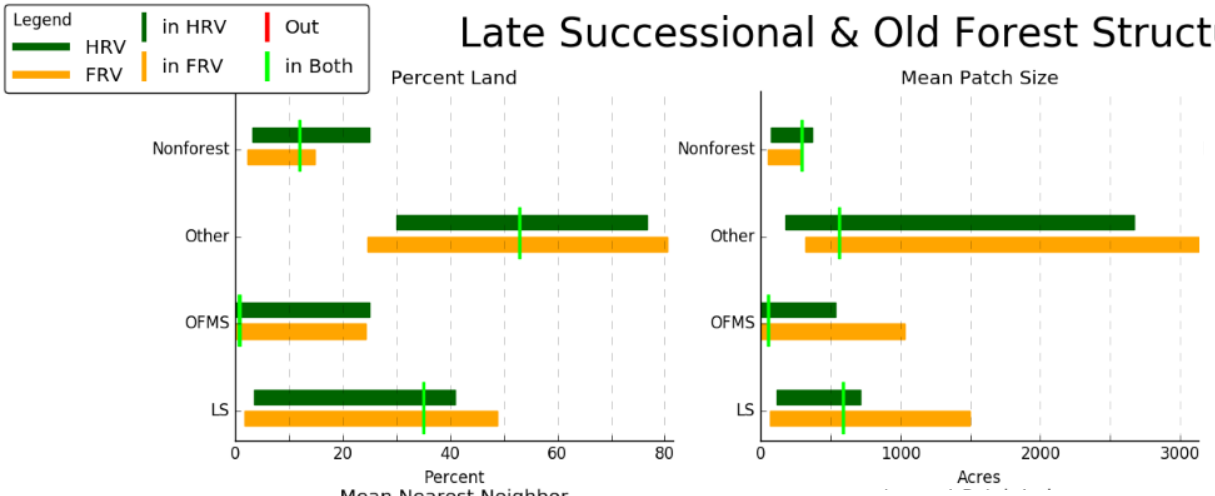
Old Forest Single Story

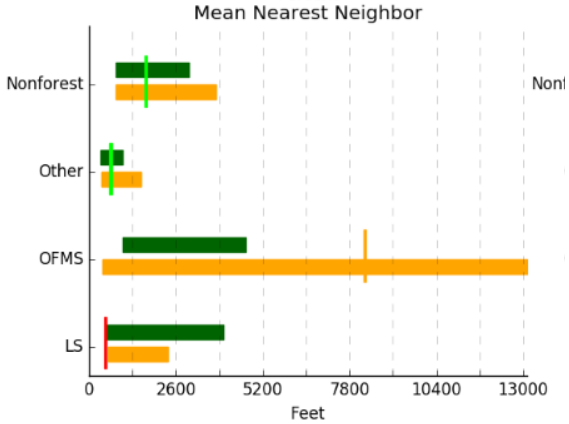
Forest Structural Class

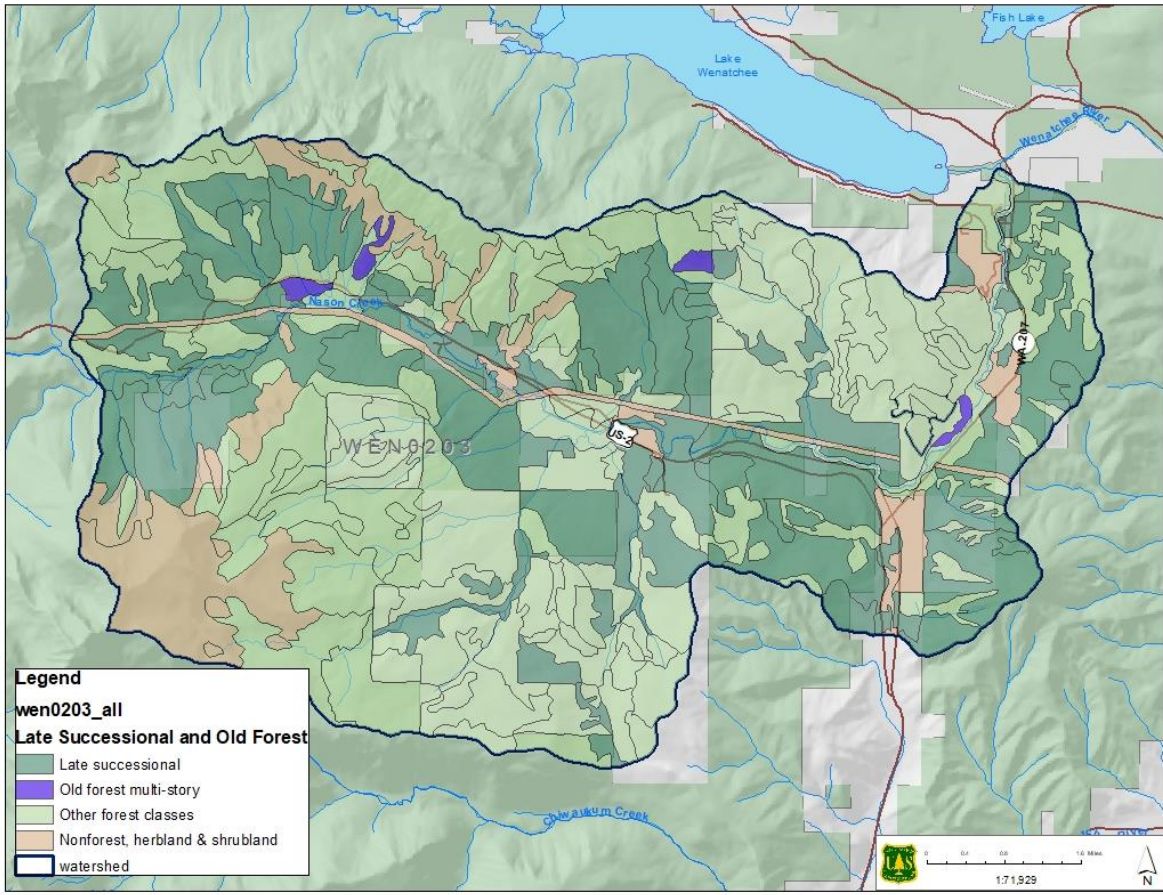




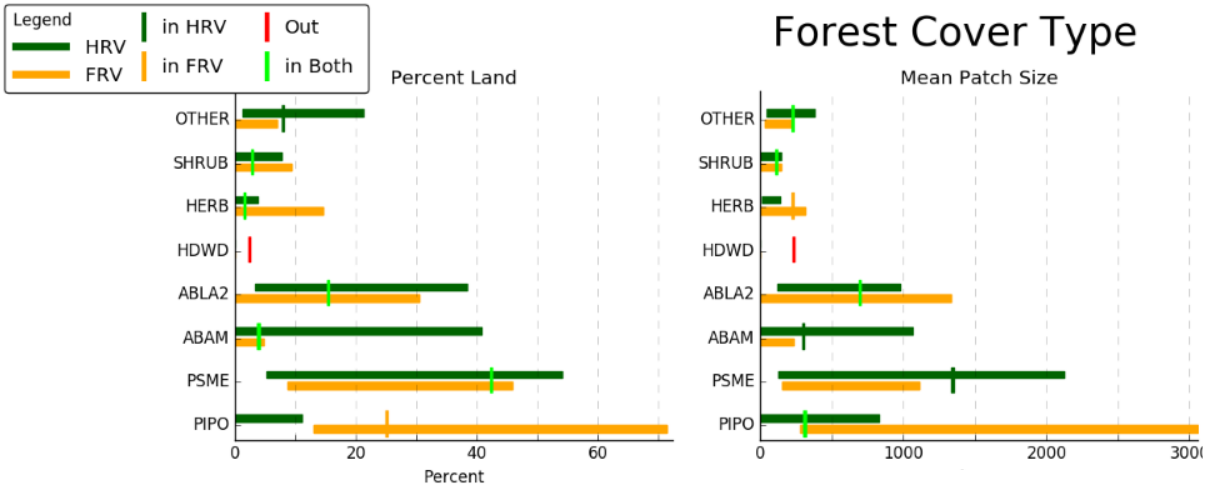
Late Successional & Old Forest Structural Classes

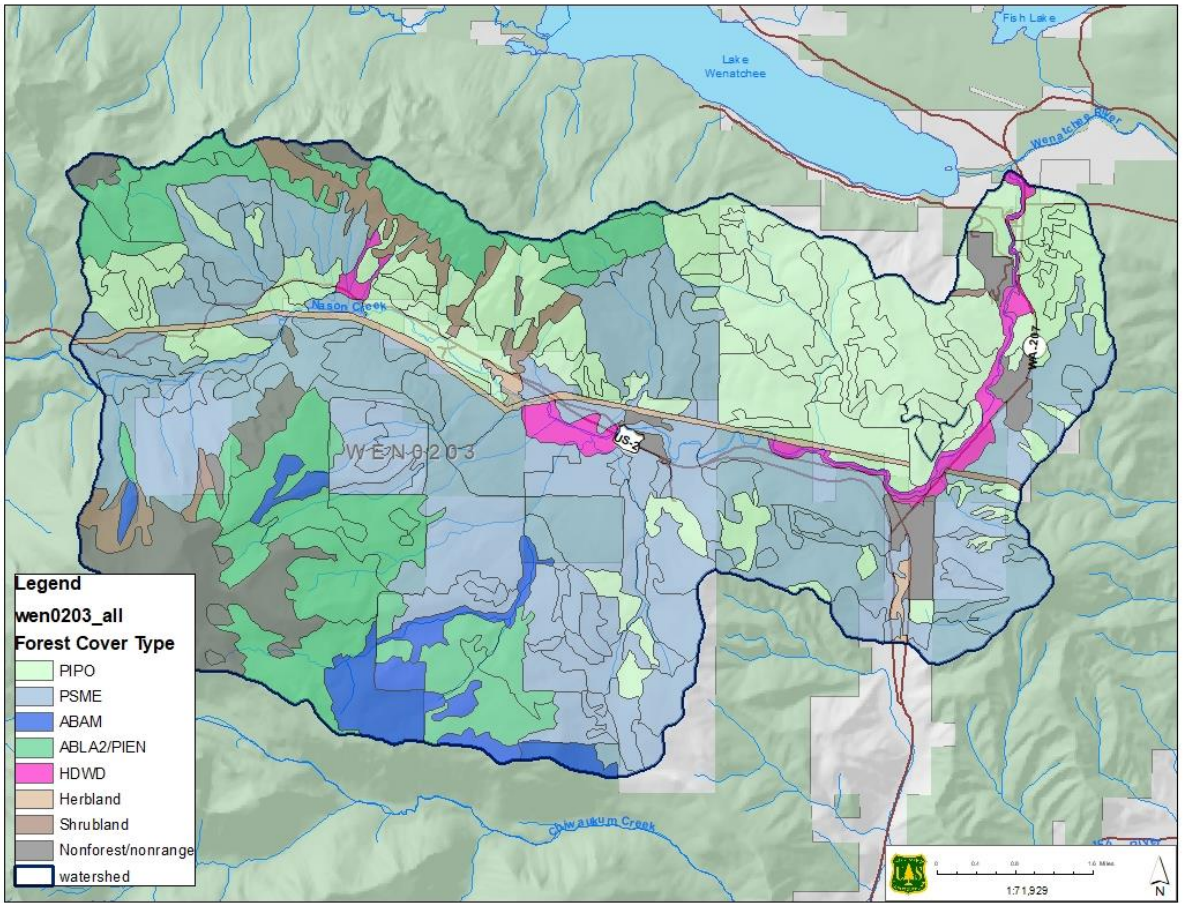




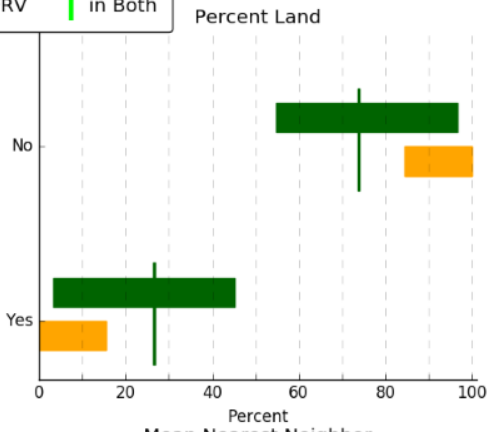


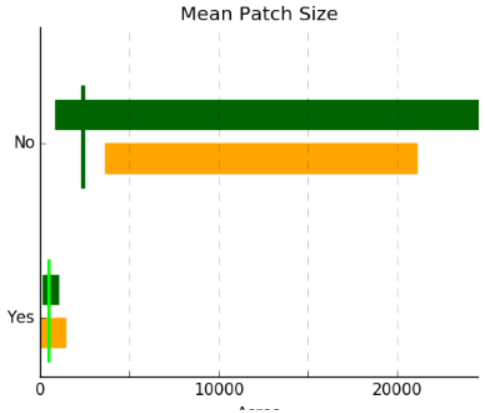
Forest Cover Type

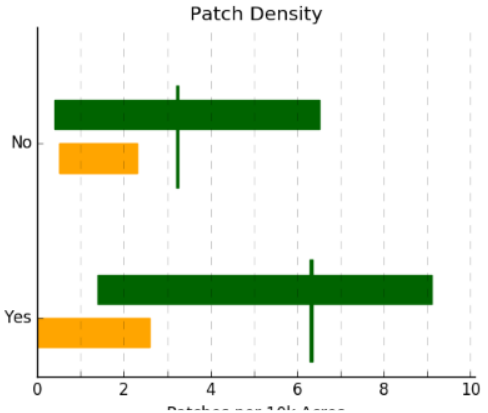


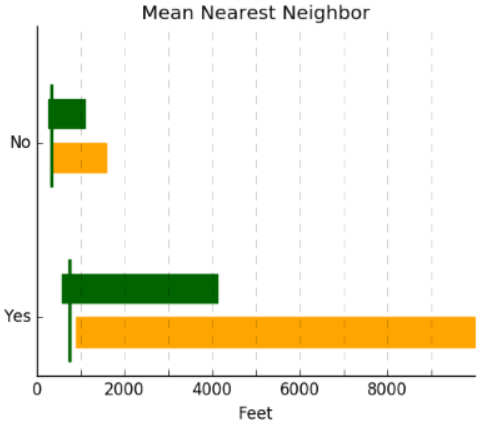


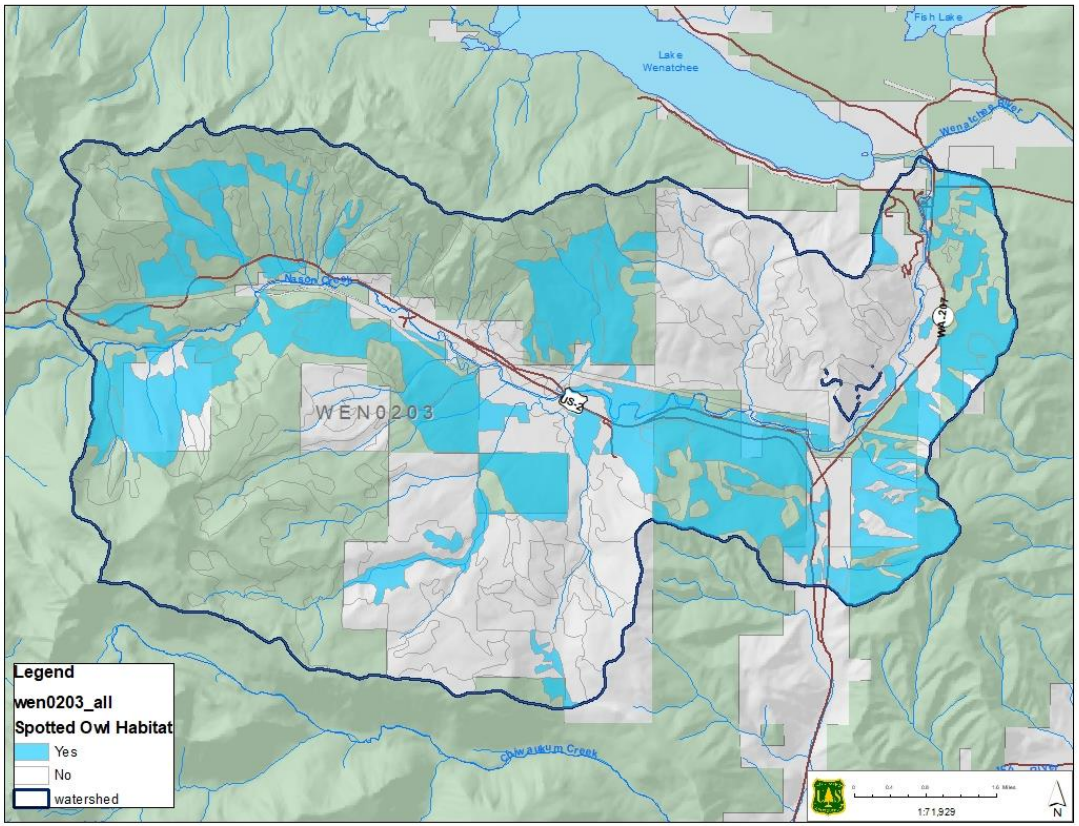
Northern Spotted Owl



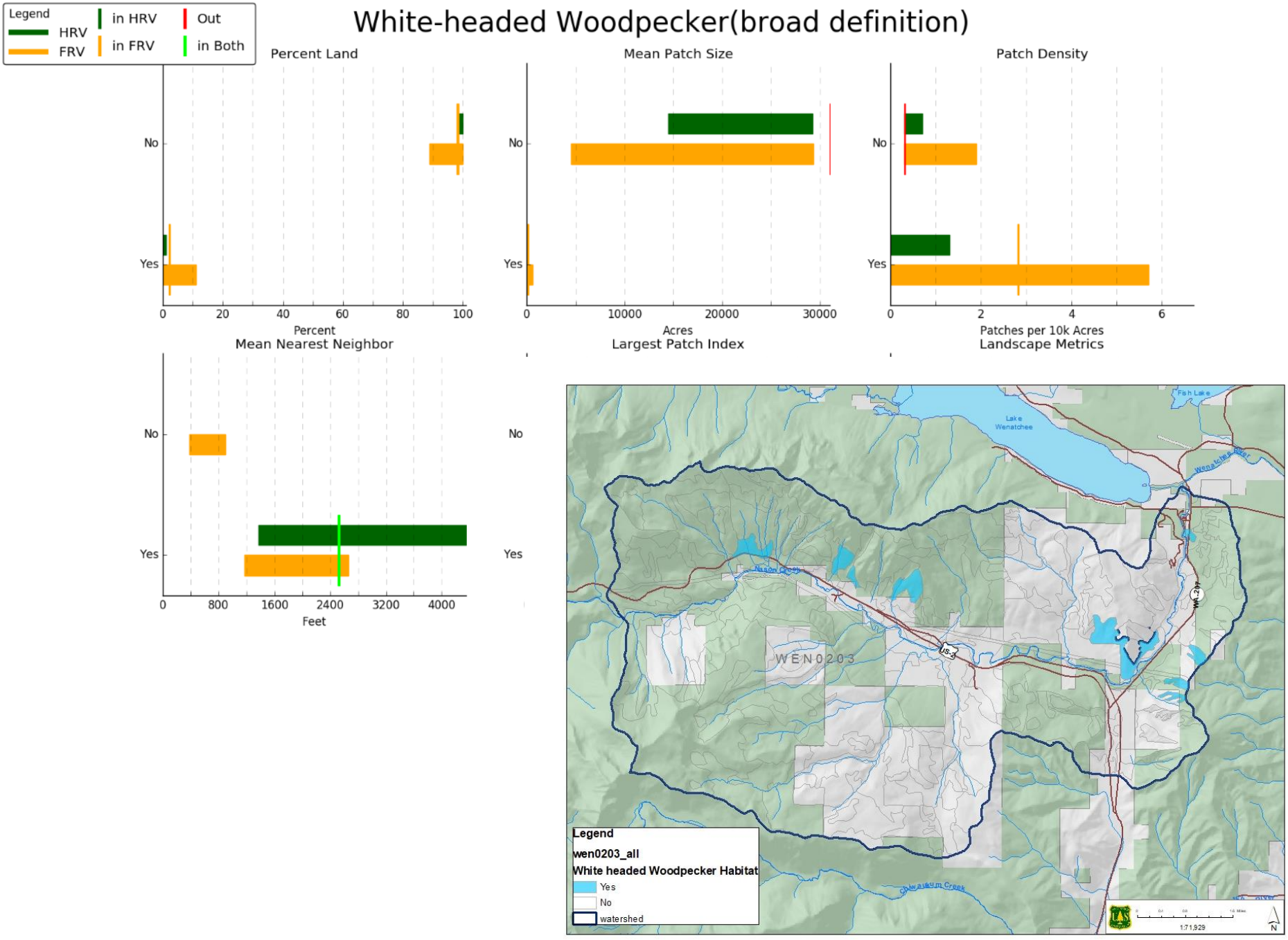




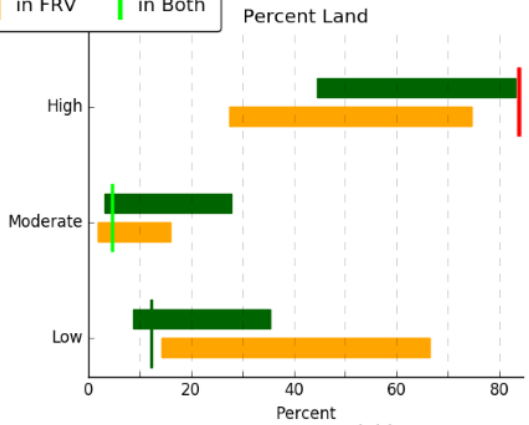


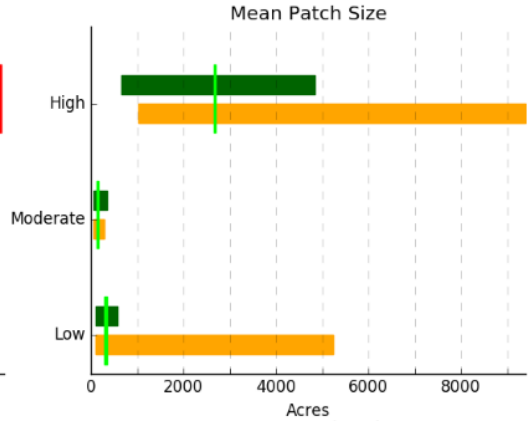


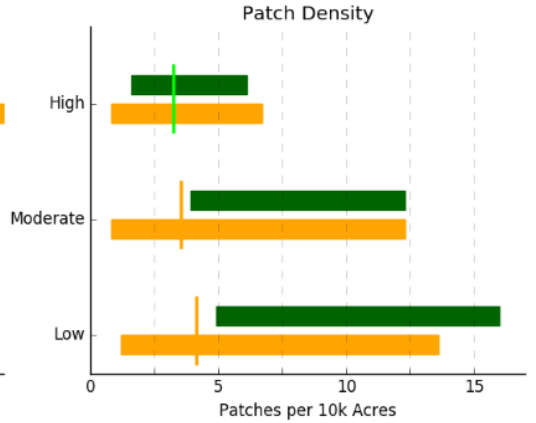
White-headed Woodpecker(broad definition)

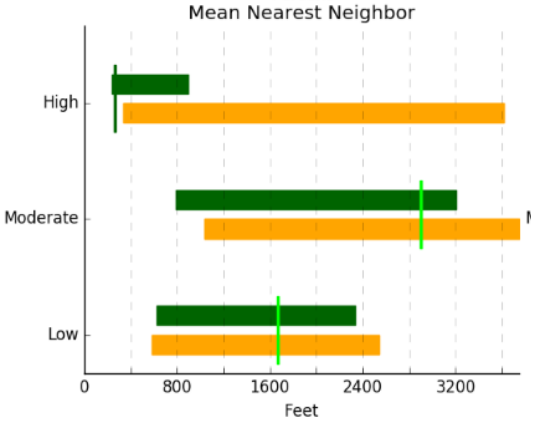


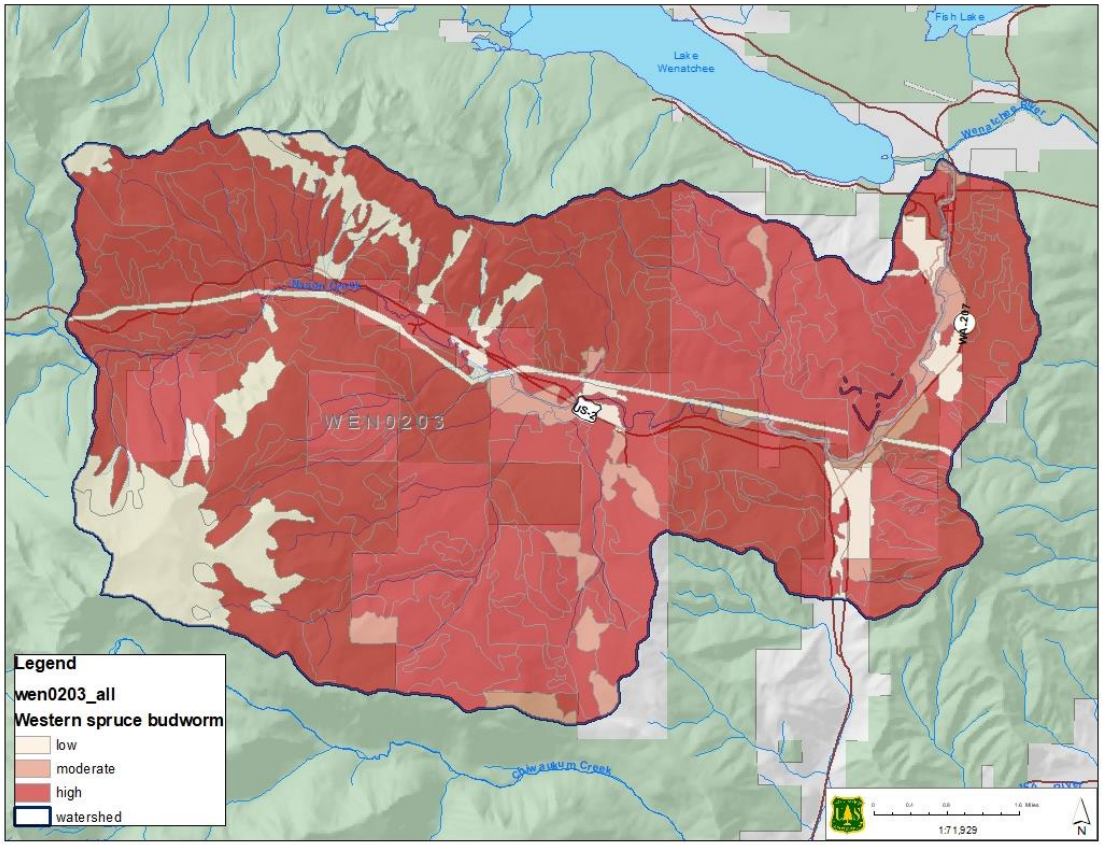
Western Spruce Budworm Vulnerability



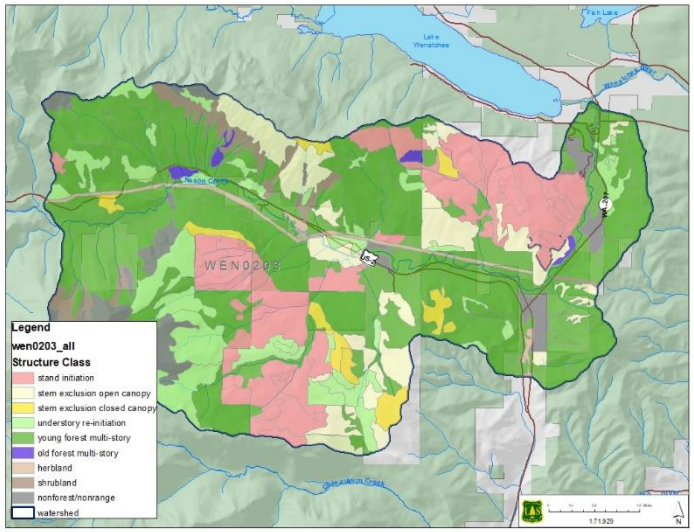








Structure: YFMS - SI



Cover: PSME

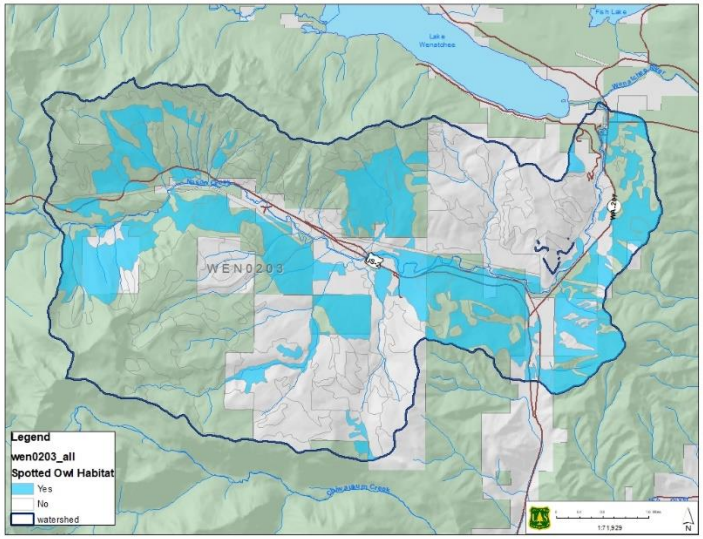
- Low on old forest, shrubland, herbland, SECC
- Too much PSME - YFMS, patch size too large

➔ High Spruce Budworm Vulnerability

- Too much SI

➔ Break up some large patches & convert whole patches to open, pine forest or shrub-herbland

NSO – WHWP Habitat



➔ Low on WHWP, need to create more

➔ Locate best patches of NSO

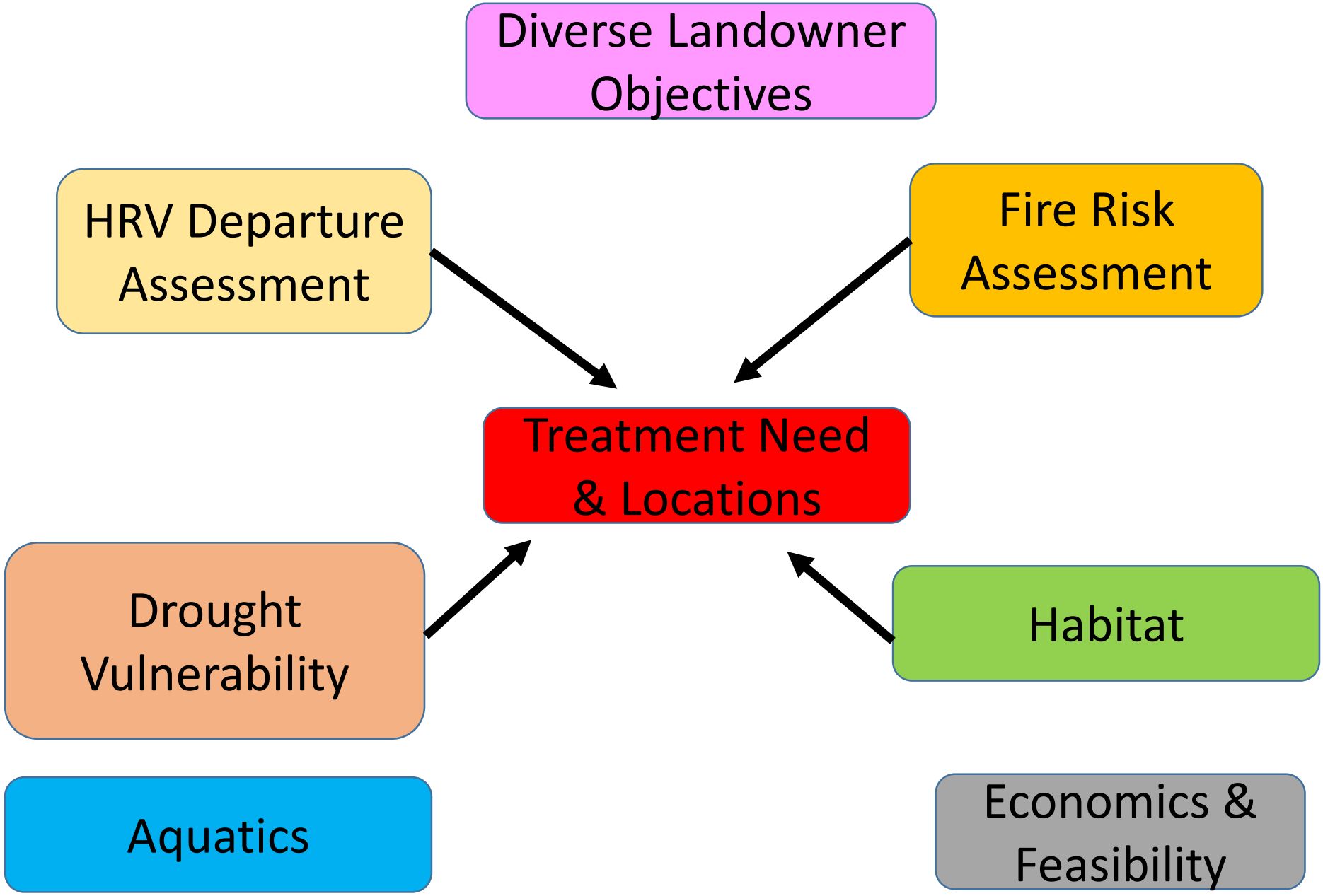
➔ Retain and consolidate best patches of habitat, Don't fragment habitat!

➔ For unsustainable or low quality habitat, convert whole patches to open forest

Historic image from National Archives and Records Administration
Seattle, WA.

2011 Image by John F Marshall.
Okanogan-Wenatchee National Forest
Wenatchee Forestryi Sciences Lab

Landscape Evaluations & Prescriptions



Fire: Quantitative Wildfire Risk Assessment

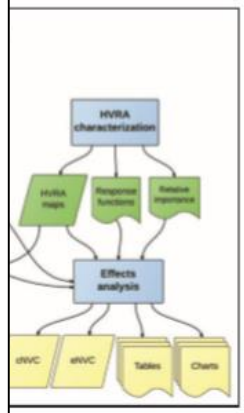
Pacific N
Wildfire
metho

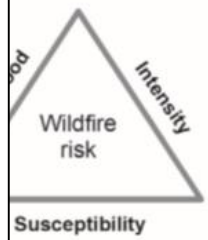
Julie Gilbertson-Day, J

Rick Stratton
United States Forest Service

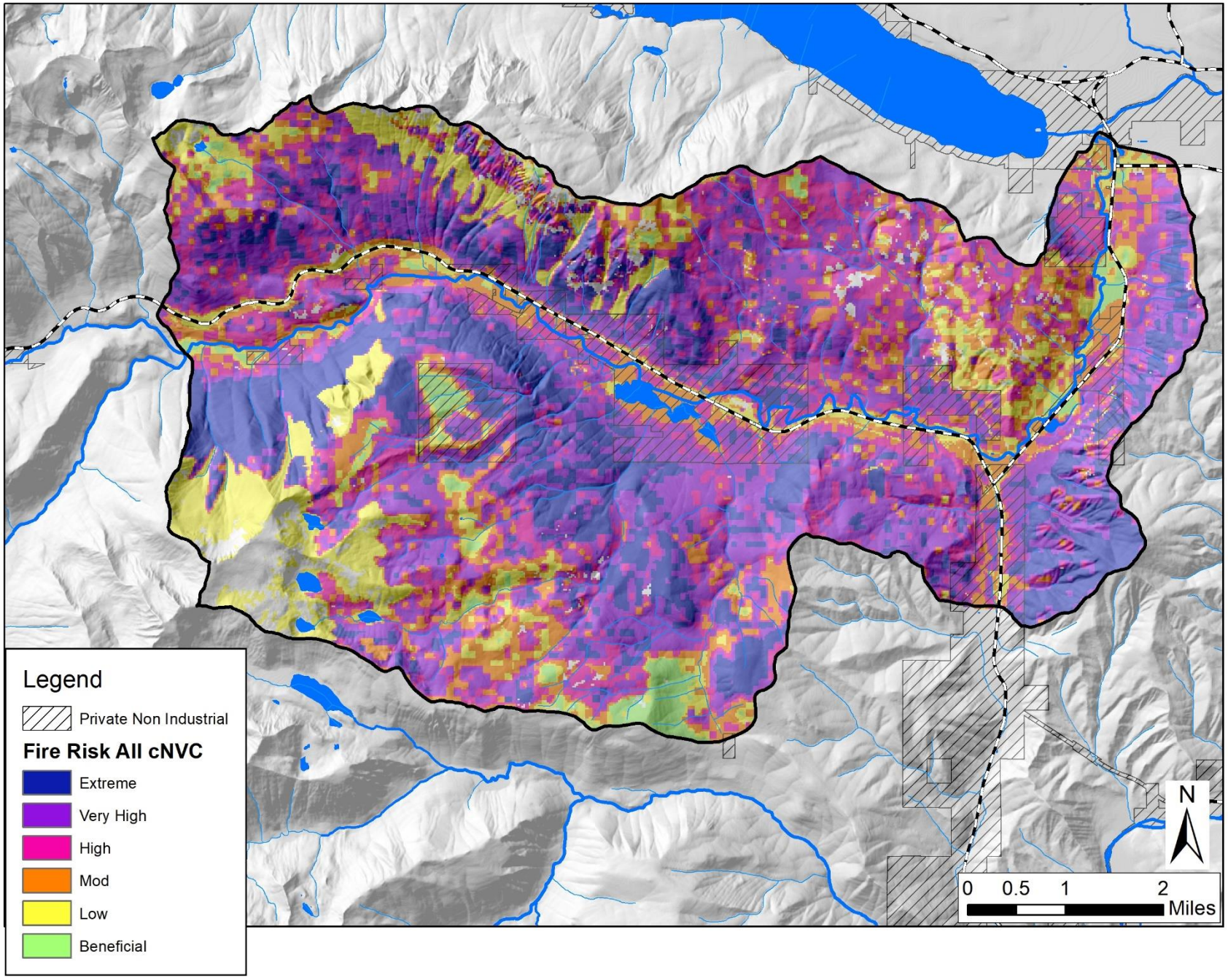
January 12, 2018

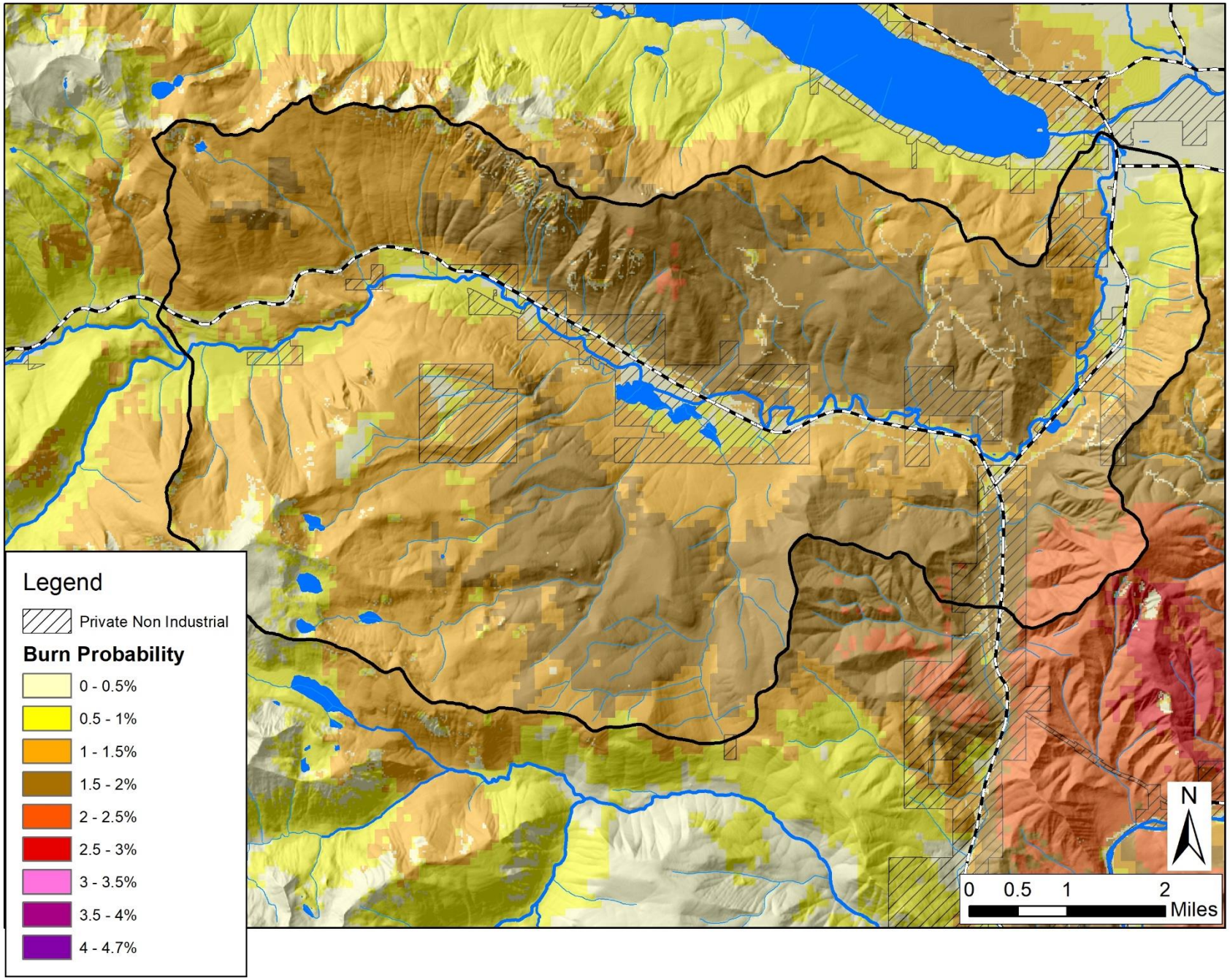
Framework
nagement

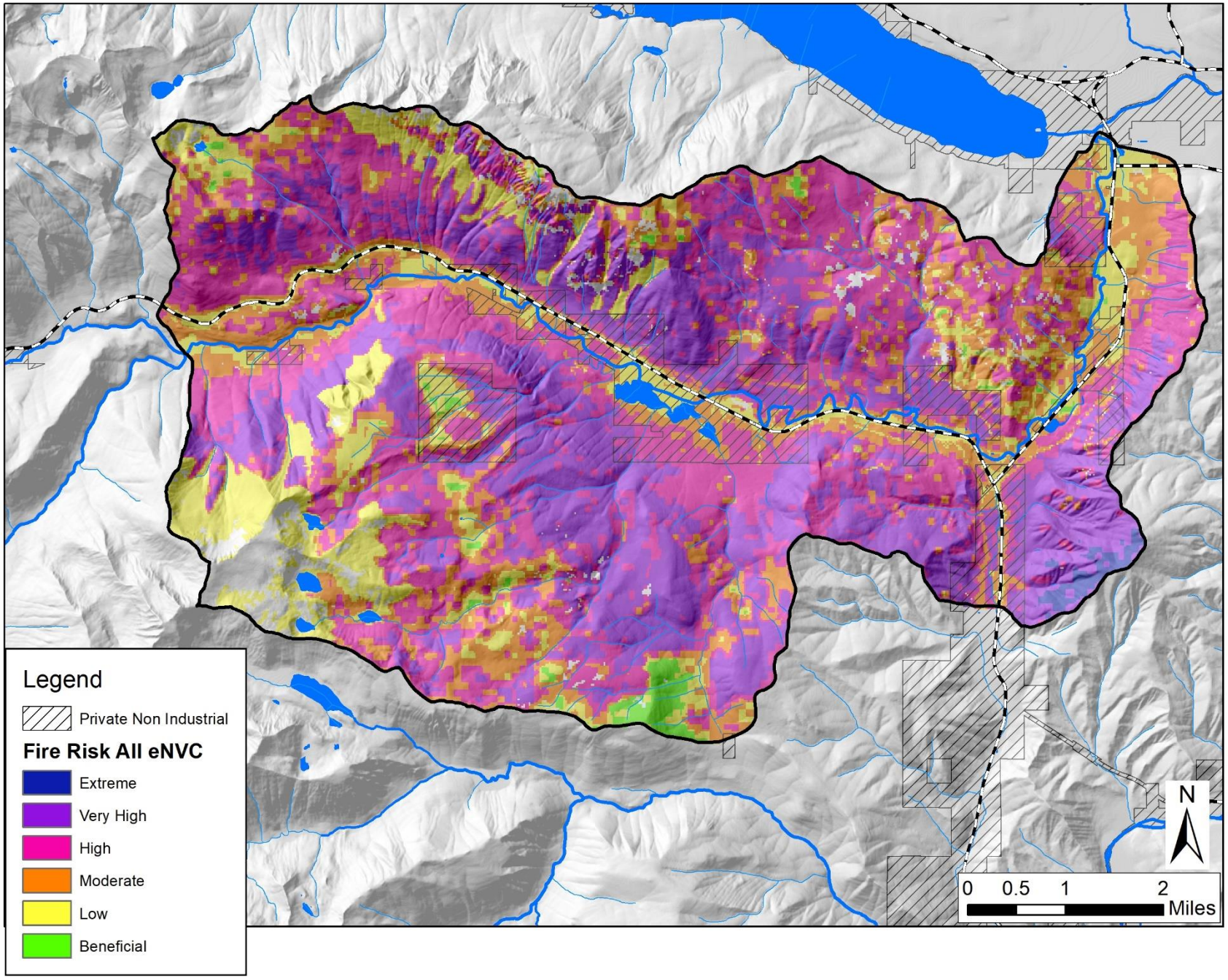


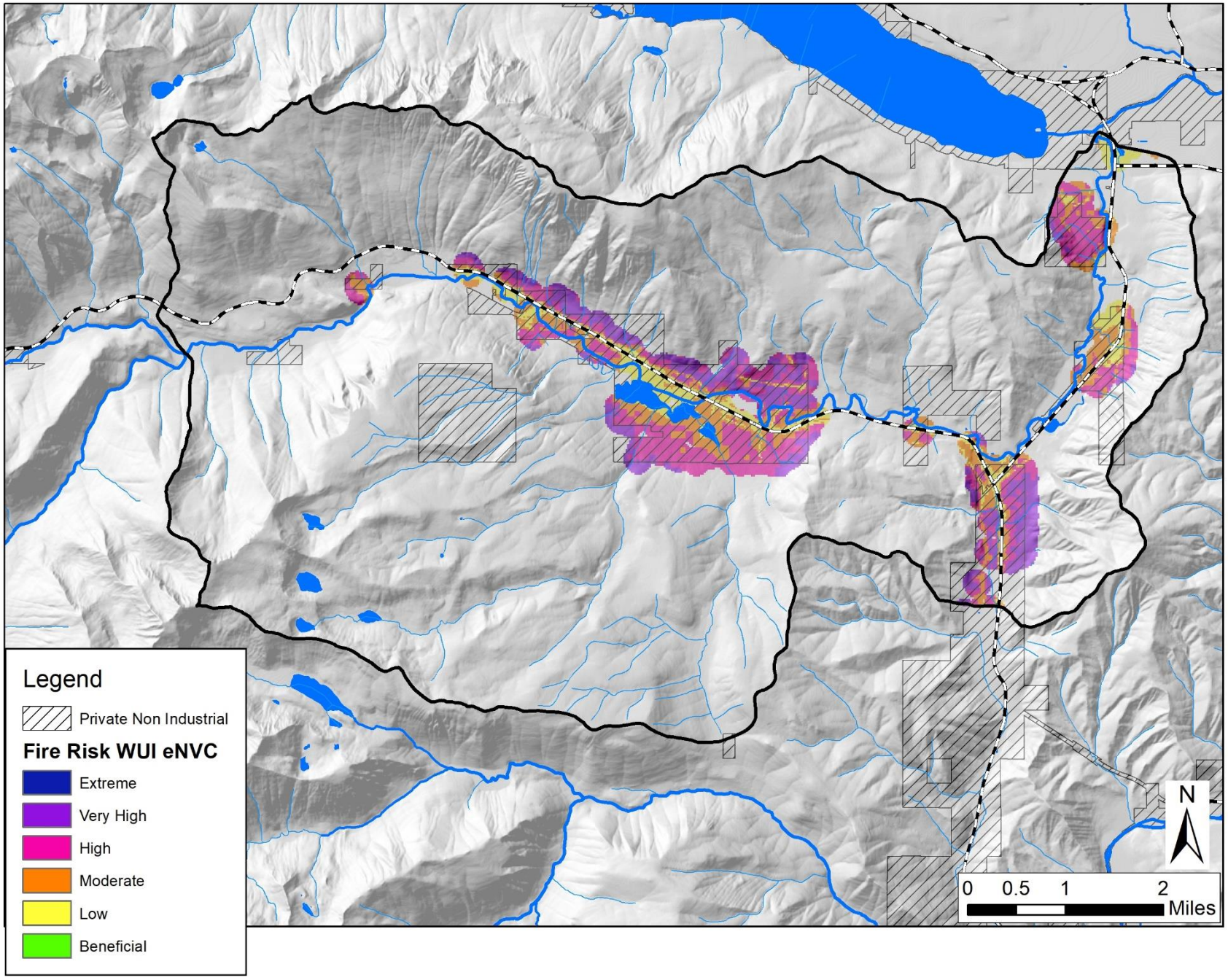


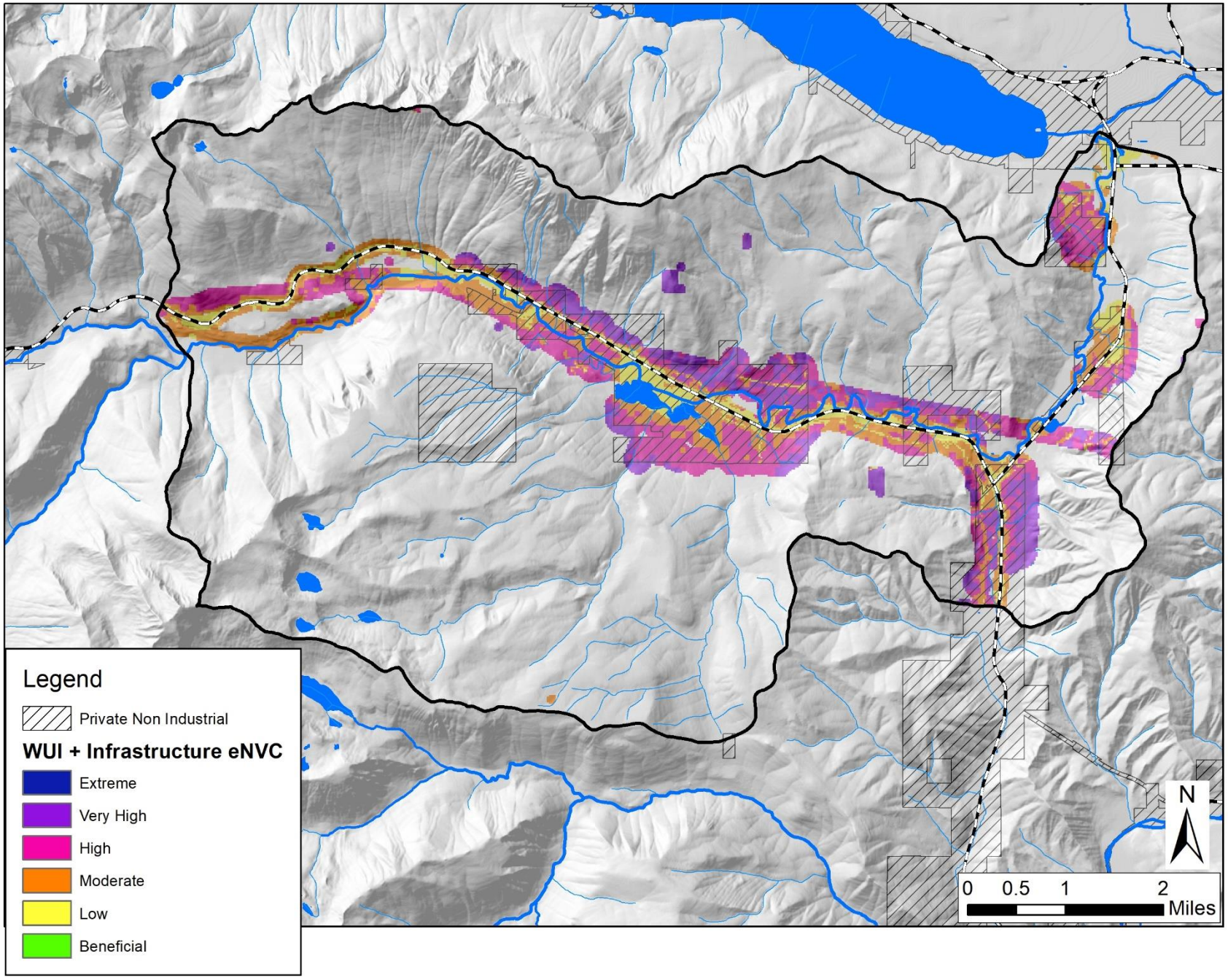
USDA United States Department of Agriculture / Forest Service
Rocky Mountain Research Station
General Technical Report RMRS-GTR-315
October 2013


Legend
Private Non Industrial
Fire Risk All cNVC
Extreme
Very High
High
Mod
Low
Beneficial
N
0 0.5 1 2
Miles


Legend
Private Non Industrial
Burn Probability
0 - 0.5%
0.5 - 1%
1 - 1.5%
1.5 - 2%
2 - 2.5%
2.5 - 3%
3 - 3.5%
3.5 - 4%
4 - 4.7%
N
0 0.5 1 2
Miles


Legend
Private Non Industrial
Fire Risk All eNVC
Extreme
Very High
High
Moderate
Low
Beneficial
N
0 0.5 1 2
Miles


Legend
Private Non Industrial
Fire Risk WUI eNVC
Extreme
Very High
High
Moderate
Low
Beneficial
N
0 0.5 1 2
Miles


Legend
Private Non Industrial
WUI + Infrastructure eNVC
Extreme
Very High
High
Moderate
Low
Beneficial
N
0 0.5 1 2
Miles

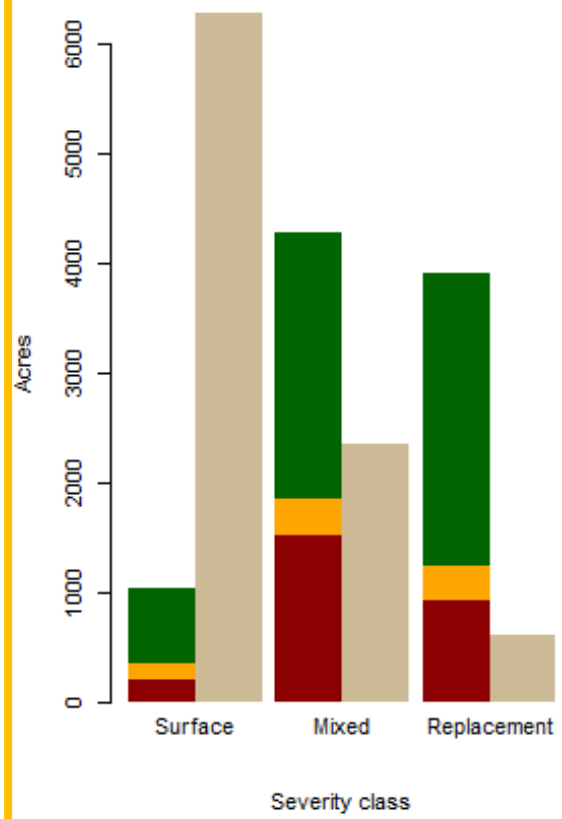
Fire Departure

Treatment acres needed to align landscape with historical fire severities

(One look at treatment need)

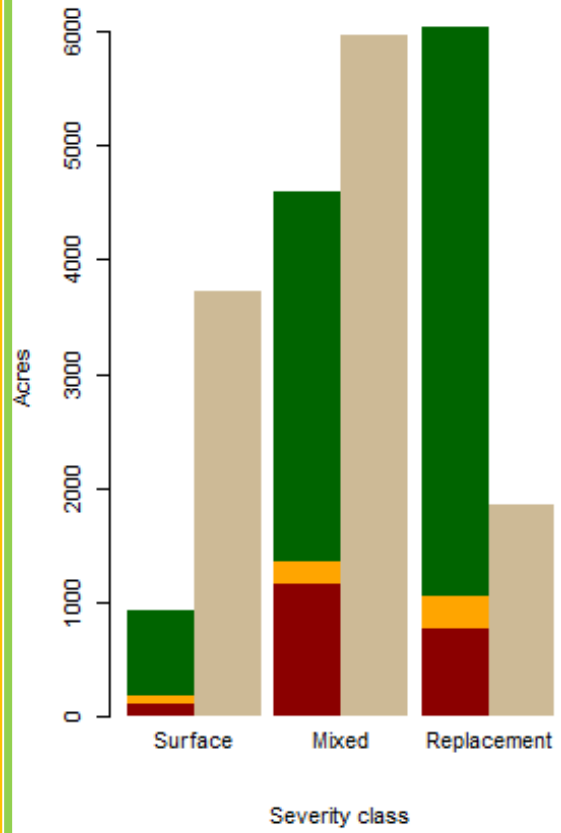
WUI & Infrastructure
P&I buffers (WUI)
Forest
Reference

Dry Forest



Treatment	Acres
Mixed -> Low	1,950
Replacement -> Low	3,300

Moist Forest



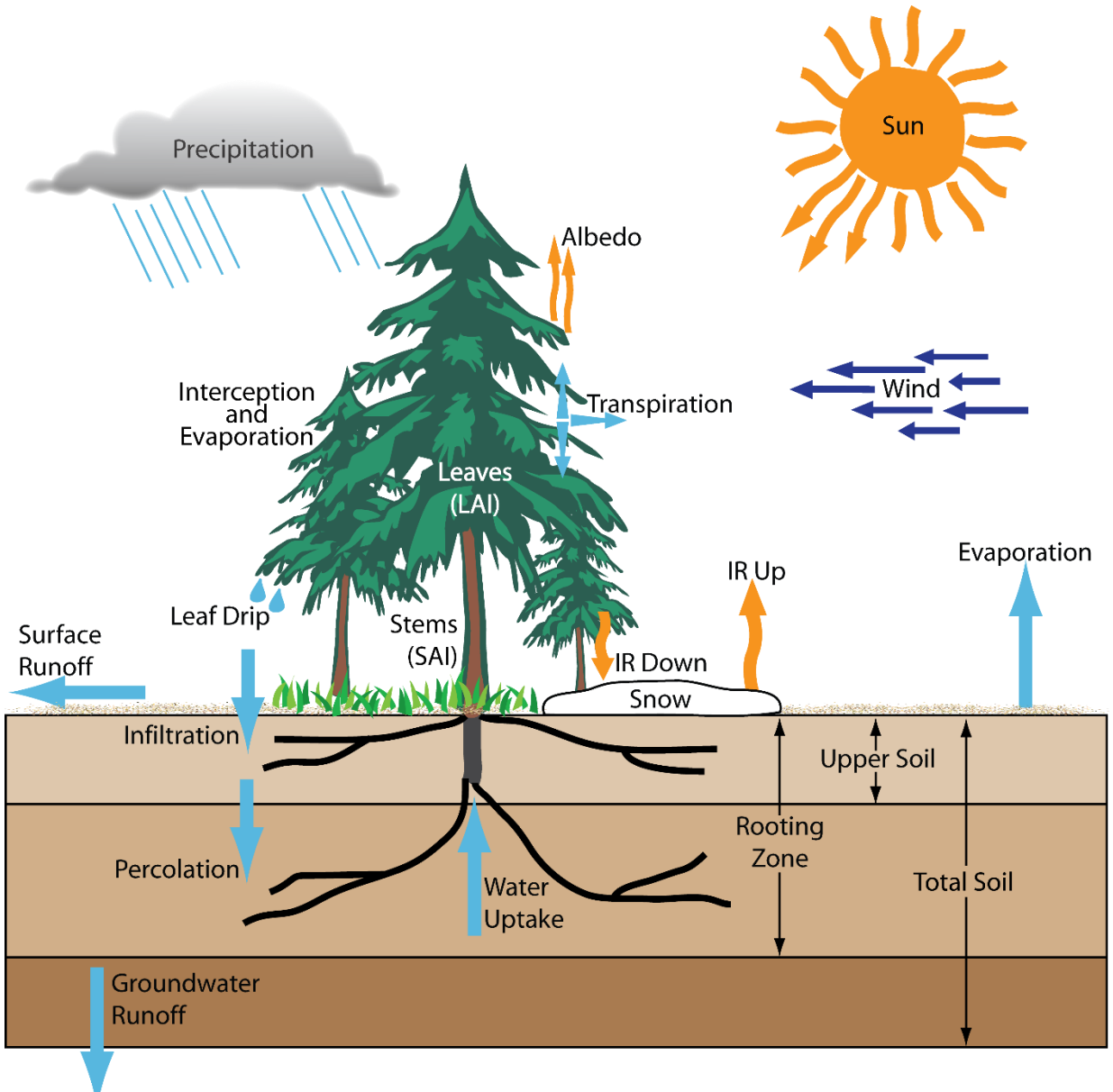
Treatment	Acres
Replacement -> Low	2,800
Replacement -> Mixed	1,350

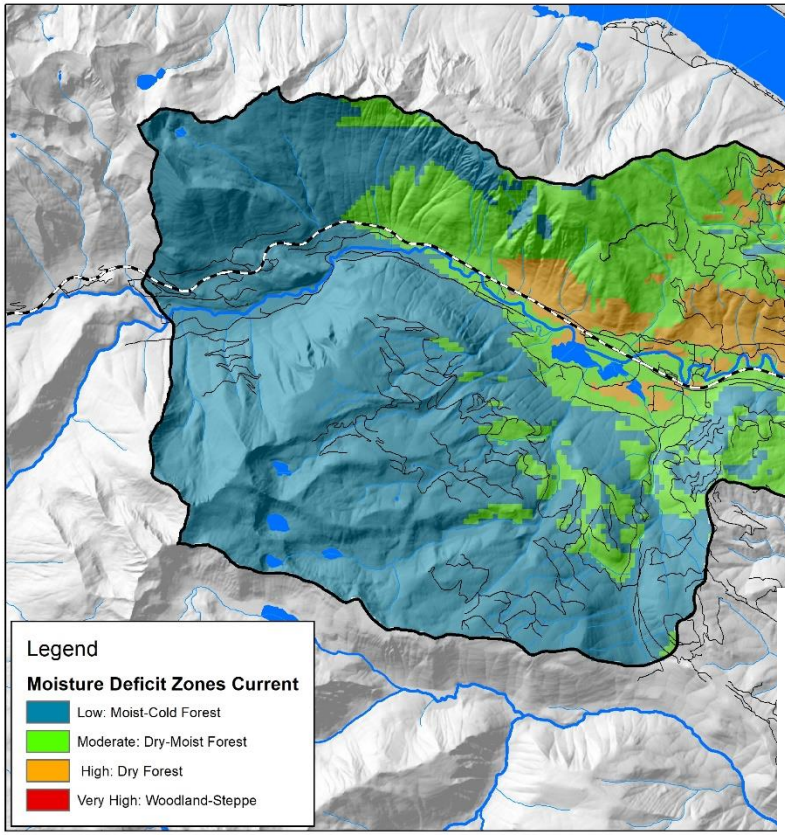
Total Treatment ~ 9,400 acres

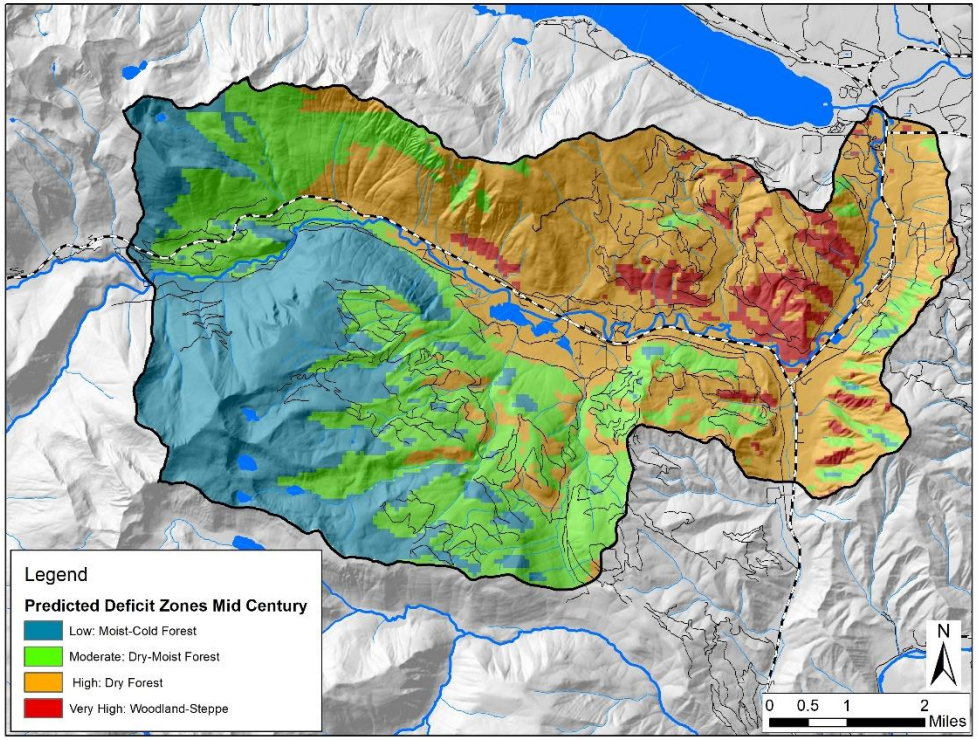
Drought Vulnerability

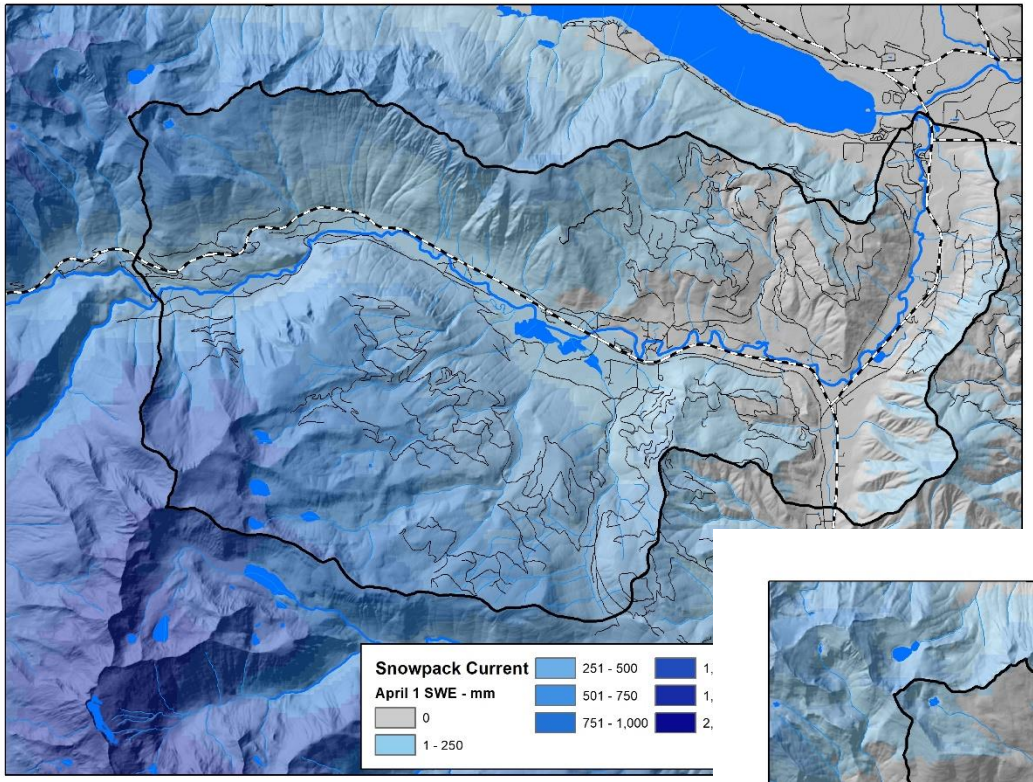
Moisture Deficit: Climate Change Projections

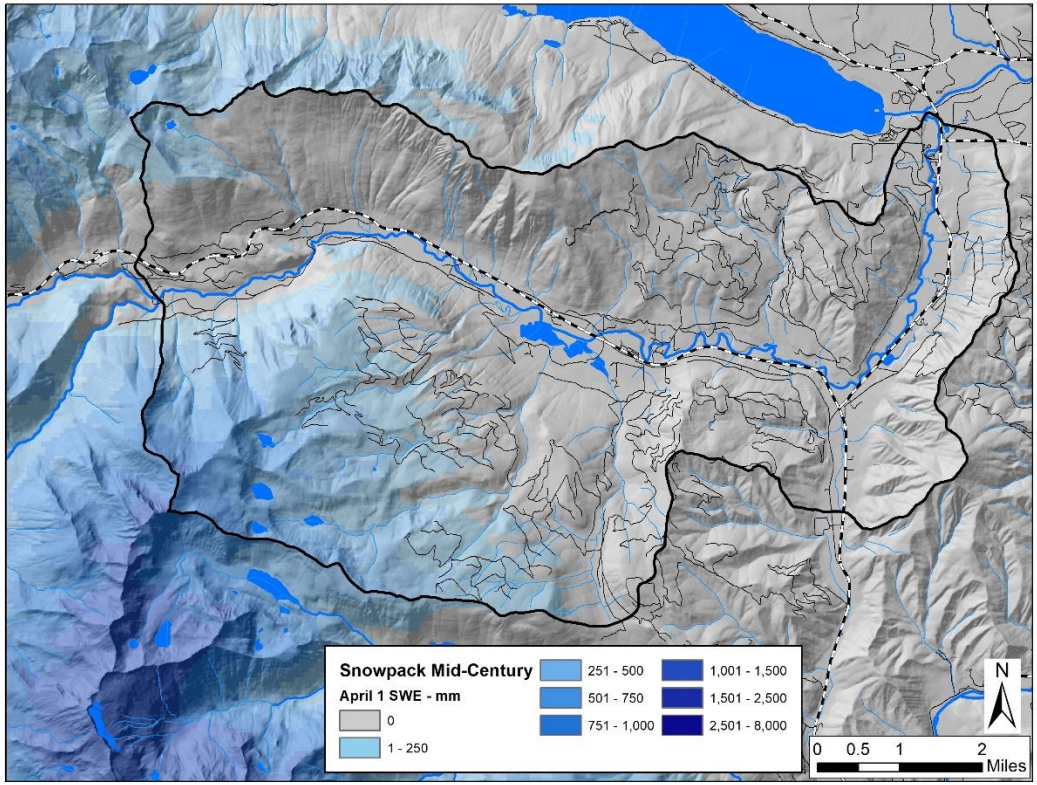
Deficit = amount of drought stress due to lack of water when solar radiation is high



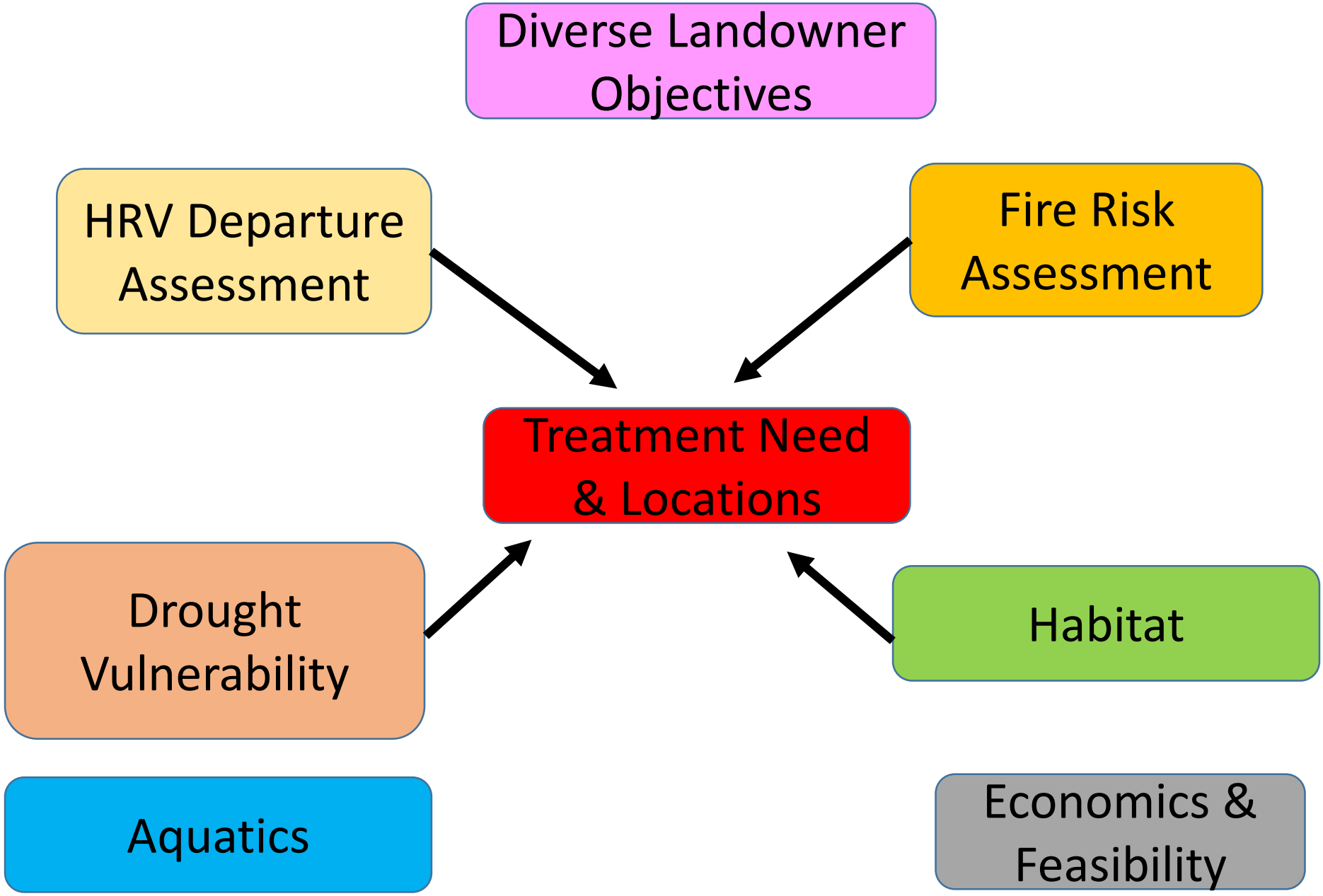

Legend
Moisture Deficit Zones Current
Low: Moist-Cold Forest
Moderate: Dry-Moist Forest
High: Dry Forest
Very High: Woodland-Steppe


Legend
Predicted Deficit Zones Mid Century
Low: Moist-Cold Forest
Moderate: Dry-Moist Forest
High: Dry Forest
Very High: Woodland-Steppe
N
0 0.5 1 2
Miles


Snowpack Current
April 1 SWE - mm
0
1 - 250
251 - 500
501 - 750
751 - 1,000
1,
1,
2,


Snowpack Mid-Century
April 1 SWE - mm
0
1 - 250
251 - 500
501 - 750
751 - 1,000
1,001 - 1,500
1,501 - 2,500
2,501 - 8,000
N
0 0.5 1 2
Miles

Landscape Evaluations & Prescriptions



Treatment Need

Total Acres	31,679	Forested Acres	28,661

Table 1

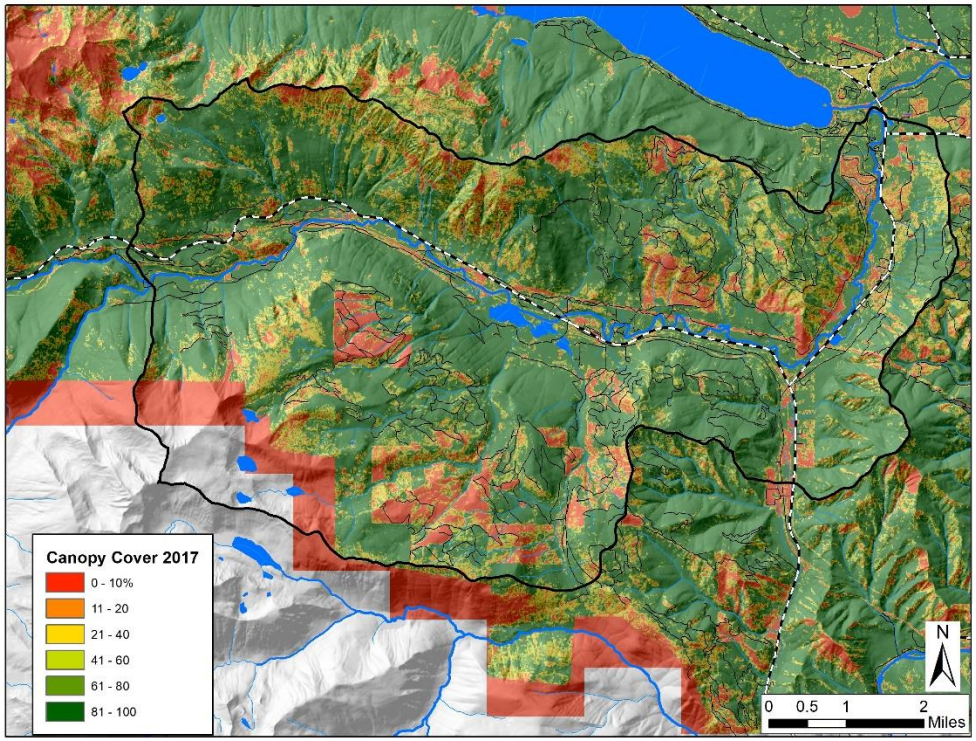
Forest Conditions to Treat		Treatment Need Acres	Current Acres by Major Landower*				
Type	Size Class		USFS	Industrial	Cmty. Forest	Private	DNR
Dry Dense	Small	250-350	20	159	726	114	0
	Medium-Large	3500-4000	3419	191	175	979	177
Moist-Cold Dense	Small	500-1500	239	801	795	264	0
	Medium-Large	1500-4000	4672	524	78	671	249
Dry Open	Medium-Large	???	0	0	0	0	0
Total		**5,750 - 9,850**	*These are current acres, not targets				

Anticipated Treatment Type	
	Non-commerical thin + fuels treatment, may be fire only
	Commerical thin + fuels treatment if access exists. May be non-commercial, fire only, or regeneration harvest
	Maintenance: prescribed fire or mechanical fuels treatment

Treat 20 – 34% of Planning Area

+ ?? Acres of maintenance of past treatments

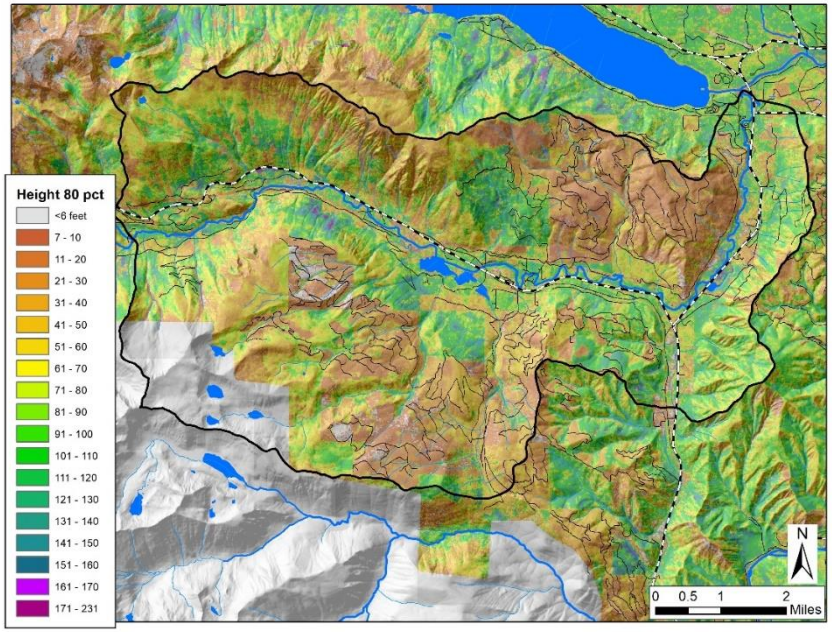
Treatment Prioritization



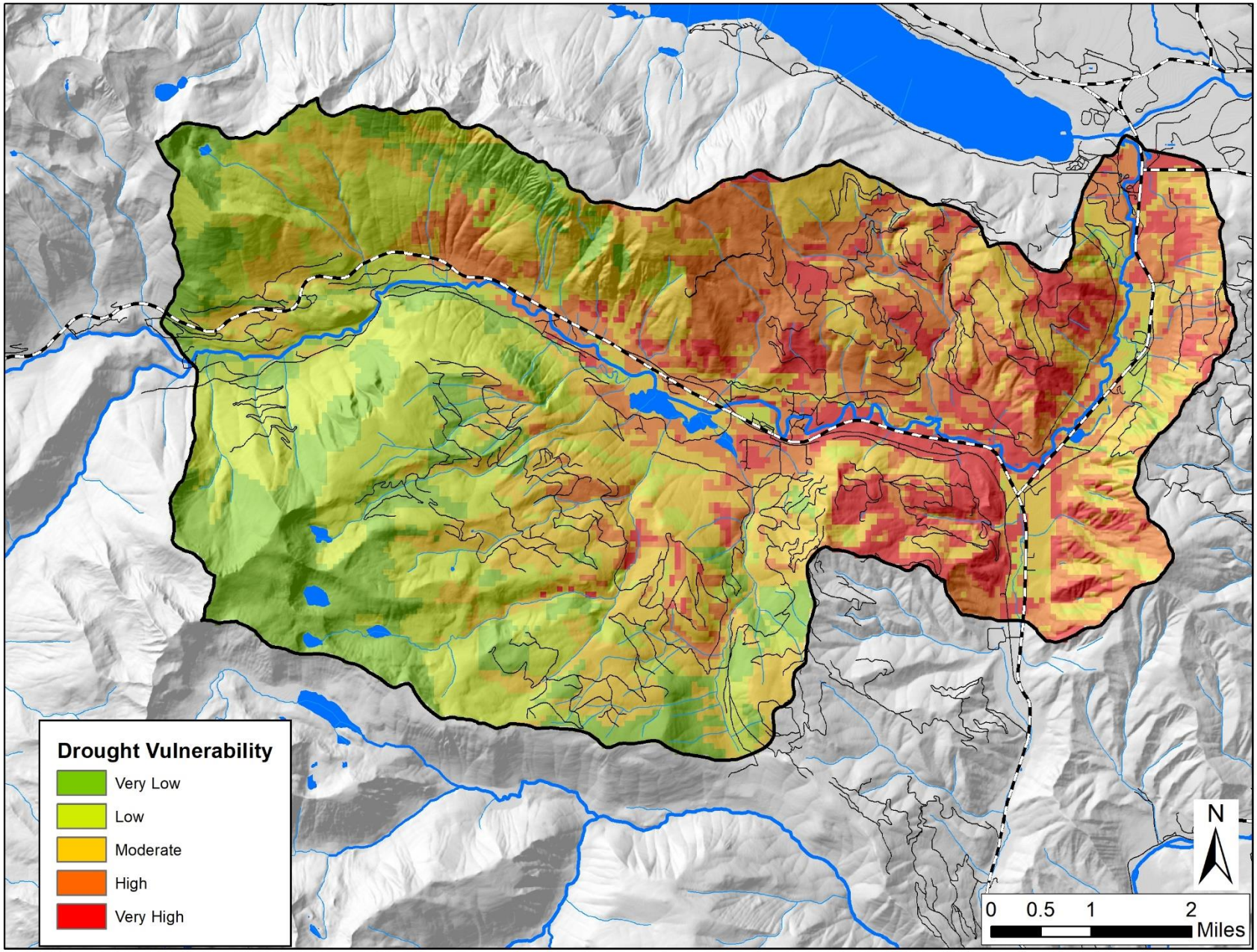
Data layers available from WA DNR:

- Canopy cover, height, canopy surface.
- Inventory metrics: basal area, volume, tree diameter, etc.

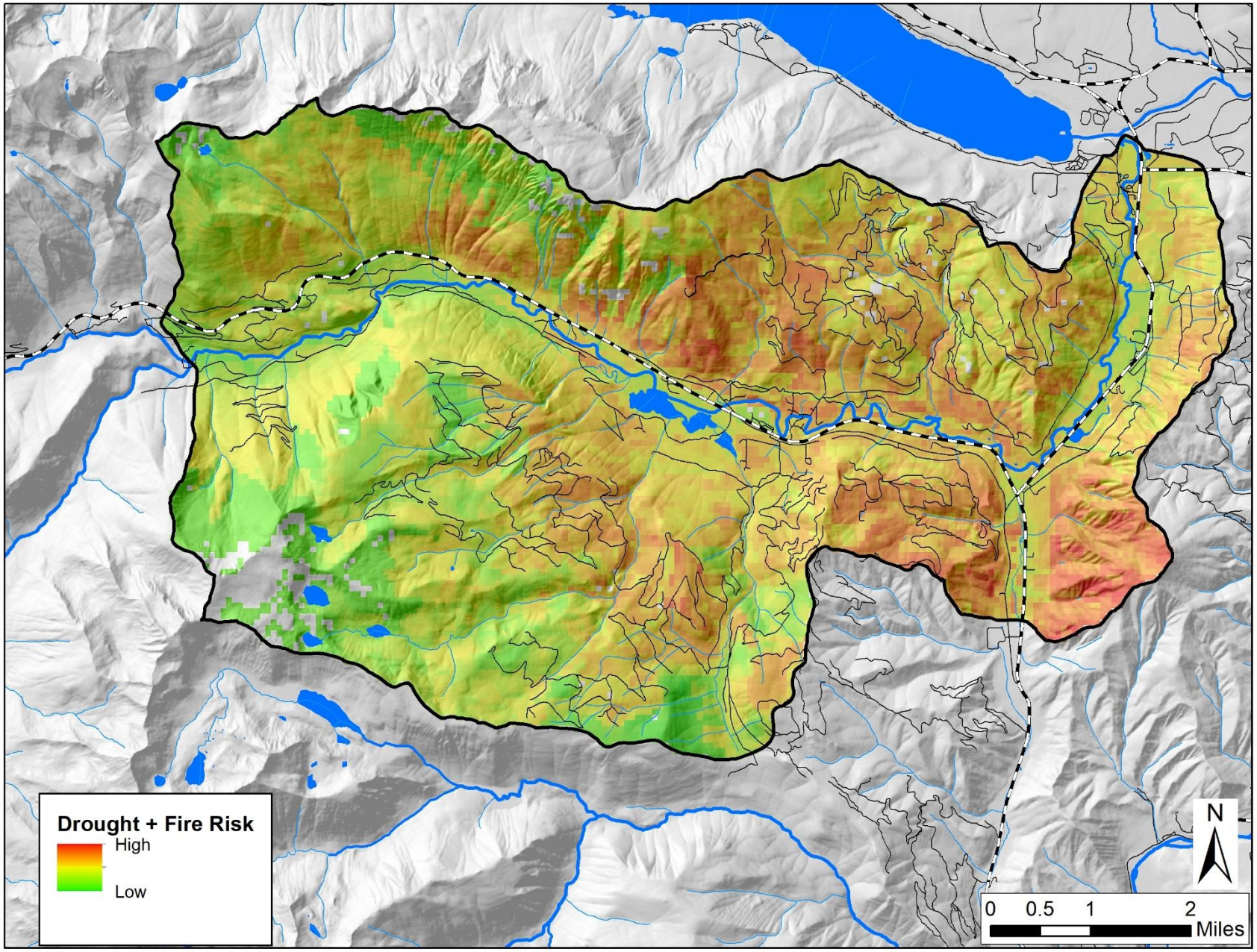
Source: Digital Aerial Photogrammetry from NAIP Imagery.



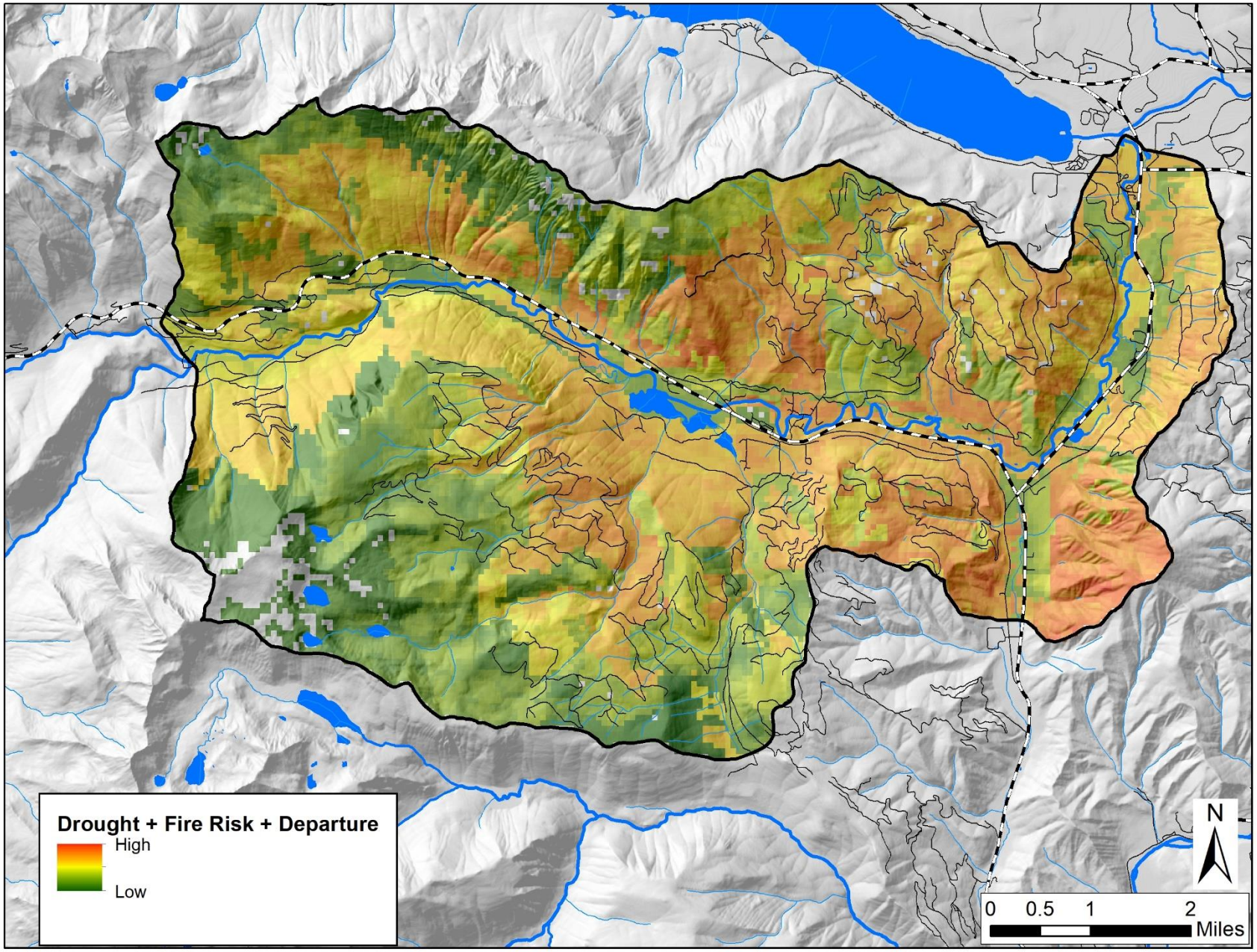
Drought Vulnerability



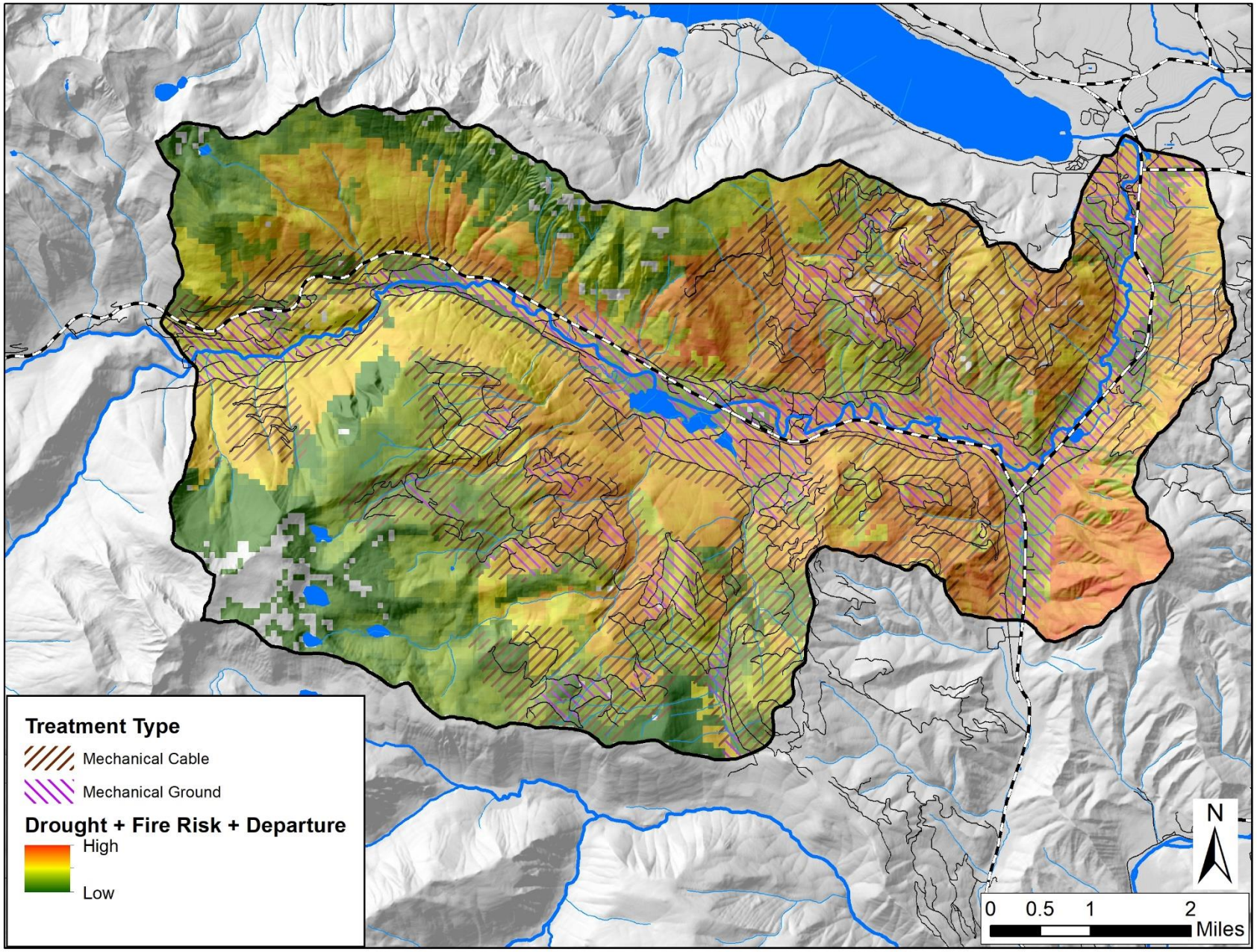
Drought Vulnerability x Fire Risk



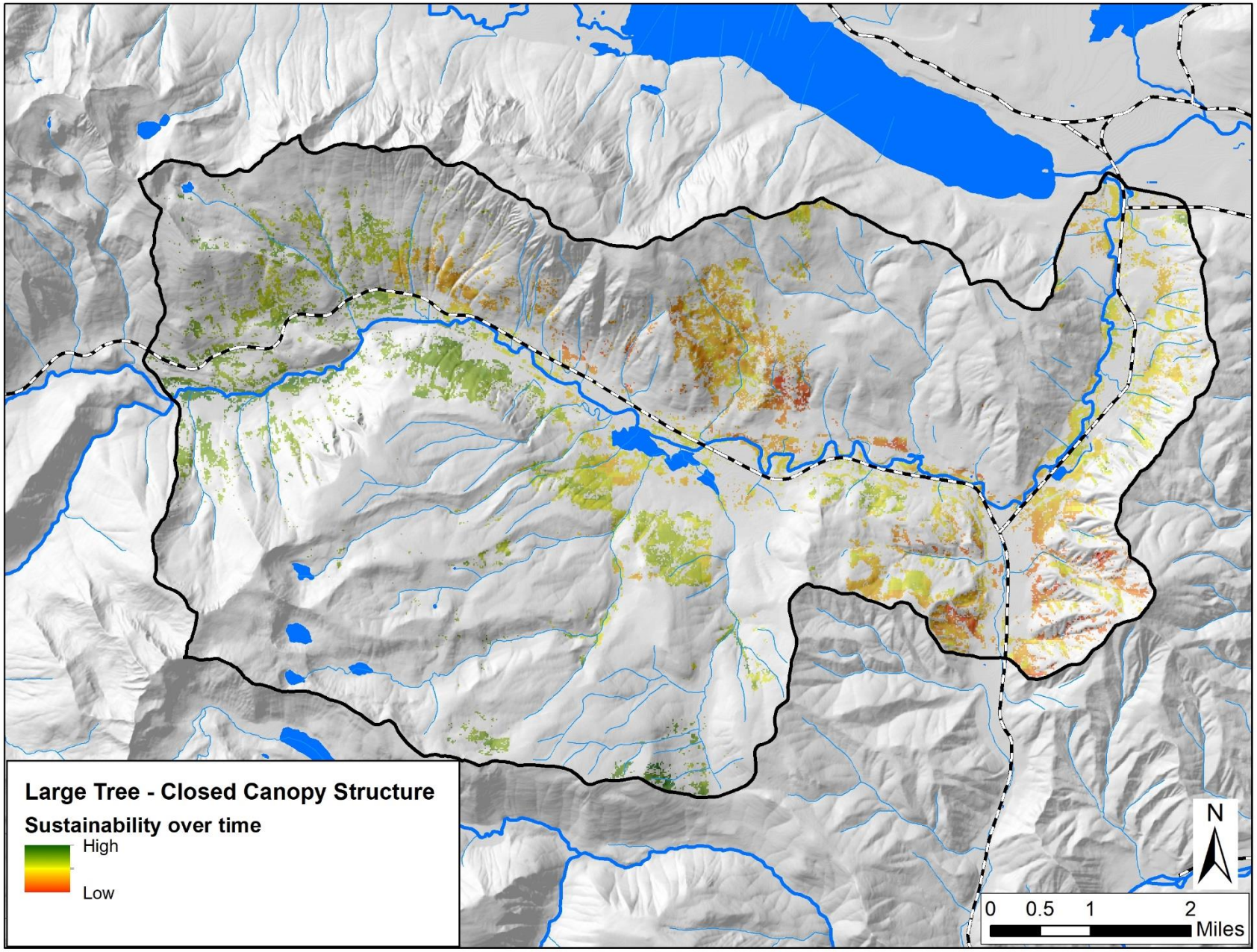
Drought Vulnerability x Fire Risk x Departed Structure Classes



Drought Vulnerability x Fire Risk x Departed Structure Classes



Locations to Maintain and Build Large-Tree Closed Canopy Forest



Next Steps

- Review results, provide feedback to DNR – Forest Health
- Integrate Community Wildfire Protection planning
- Meet with Forest Service and Weyerhaeuser
- Work with Chelan County and others on outreach to landowners and public
- Field tour in fall 2020
- Finalize Landscape Evaluation
- Work to implement treatments