

20-Year Forest Health Strategic Plan



Forest Practices Board
February 2018



DNR was tasked by the state Legislature to:

“...develop a twenty-year strategic plan to treat areas of state forest land that have been identified by the department as being in poor health.”



20-Year Forest Health Plan

Released in October 2017

- Treat 1,250,000 acres by 2037: (62,500 acres per year)
- Sets vision, guiding principles, & process for moving forward
- All lands approach
- Science based
- Social license: over 30 organizations involved.



20-YEAR FOREST HEALTH STRATEGIC PLAN

EASTERN WASHINGTON



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



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

DNR's Forest Health Strategic Plan:

VISION:

Washington's forested landscapes are in an ecologically functioning and resilient condition and meet the economic and social needs of present and future generations.

MISSION:

Restore and manage forested landscapes at a pace and scale that reduces the risk of uncharacteristic wildfires and increases the health and resilience of forest and aquatic ecosystems in a changing climate for rural communities and the people of Washington State.

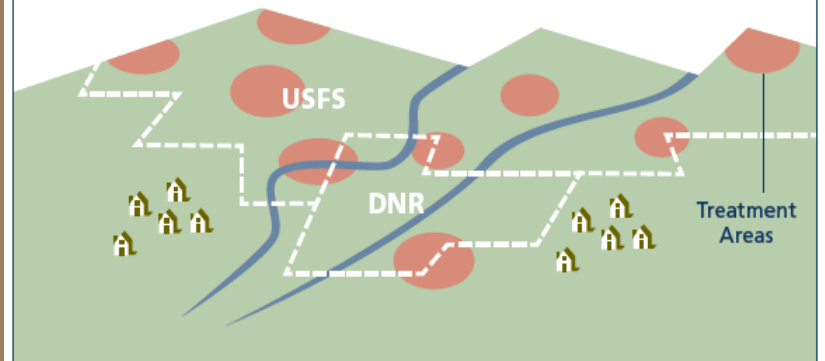
OVERARCHING STRATEGY:

To maximize effectiveness, coordinate and prioritize landowners' treatments activities across all forest owners in a landscape.



There was consensus among committee participants to advance a **landscape-scale, cross-boundary** strategy to achieve forest health and **coordinate** project planning and implementation across landownership boundaries.

Current: Scattered treatments



Vision: Coordinated, contiguous treatments



DNR's Forest Health Strategic Plan: Goals

Goal 1

- Conduct 1.25 million acres of scientifically sound, landscape scale, cross-boundary management and restoration treatments in priority watersheds to increase forest and watershed resilience by 2037.

Goal 2

- Reduce risk of uncharacteristic wildfire and other disturbances to help protect lives, communities, property, ecosystems, assets and working forests .

Goal 3

- Enhance economic development through implementation of forest restoration and management strategies that maintain and attract private sector investments and employment in rural communities.

Goal 4

- Plan and implement coordinated, landscape-scale forest restoration and management treatments in a manner that integrates landowner objectives and responsibilities.

Goal 5

- Develop and implement a forest health resilience monitoring program that establishes criteria, tools, and processes to monitor forest and watershed conditions, assess progress, and reassess strategies over time.



Goal 1

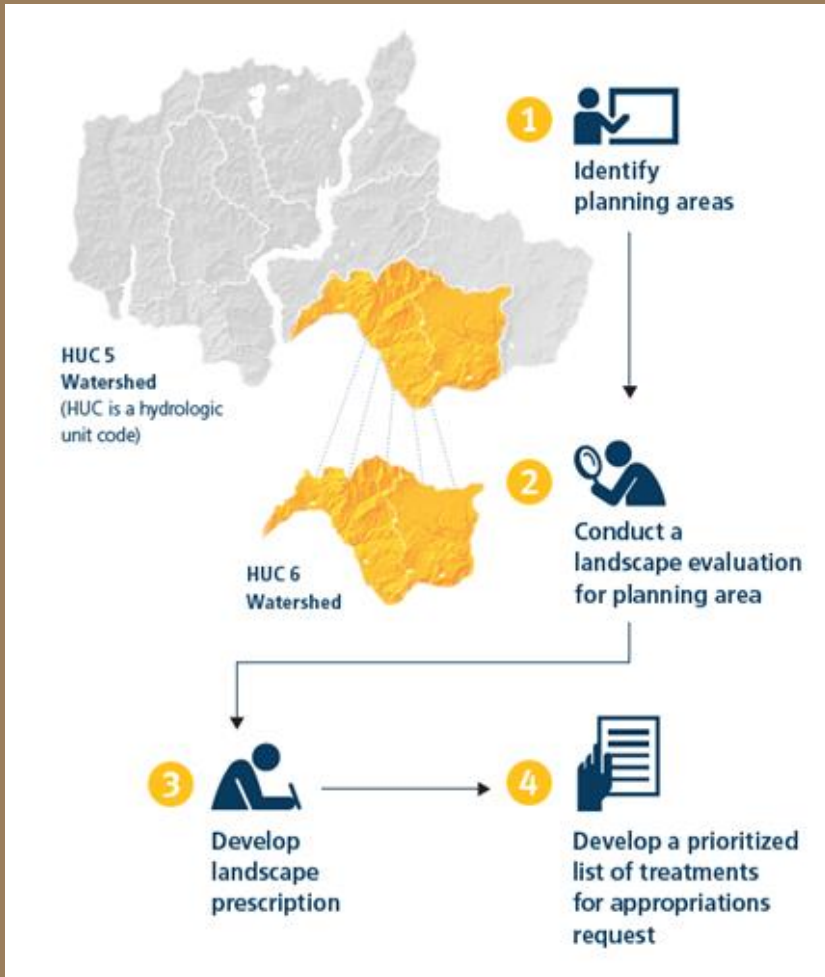
- Conduct 1.25 million acres of scientifically sound, landscape scale, cross-boundary management and restoration treatments in priority watersheds to increase forest and watershed resilience by 2037.

Strategies

- **Prioritize** forest health treatments in landscapes with the highest need and relative risk.
- Conduct landscape evaluations to efficiently prioritize and design forest health treatments to improve forest conditions and enhance ecosystem values across **landscapes**.
- **Coordinate** treatment activities across boundaries to maximize effectiveness.
- Work with forest **collaboratives** to build social license, address barriers, and leverage resources.
- Increase **capacity** to implement landscape-scale **cross boundary management** approaches through existing authorities and programs such as GNA.



Making Landscape-Scale Restoration a Reality: SB 5546 Implementation



These steps will be done in coordination with local forest collaboratives, major landowners and the Forest Health Advisory Committee.



Process & Timeline

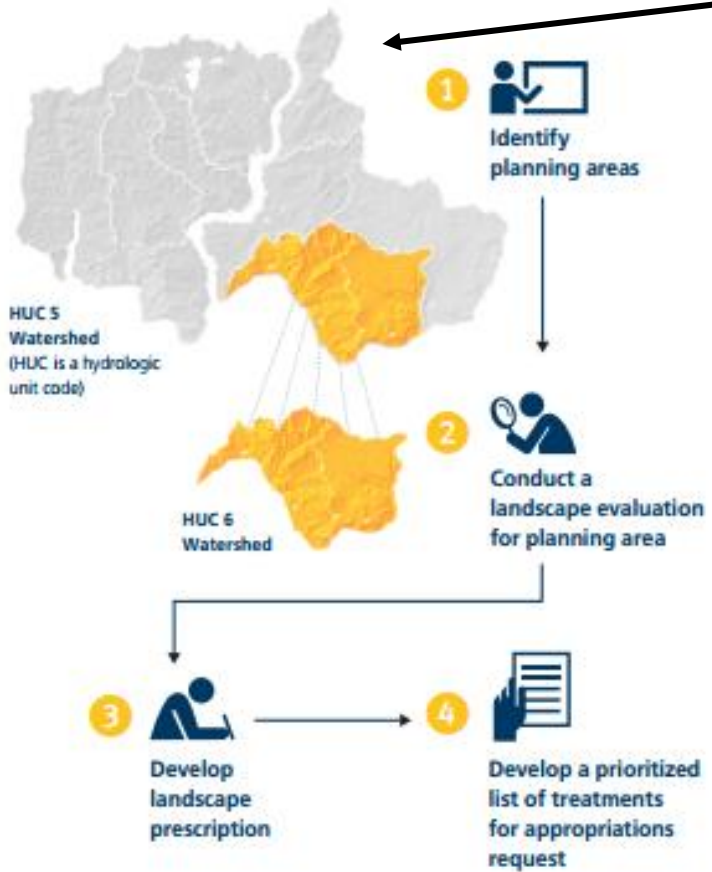
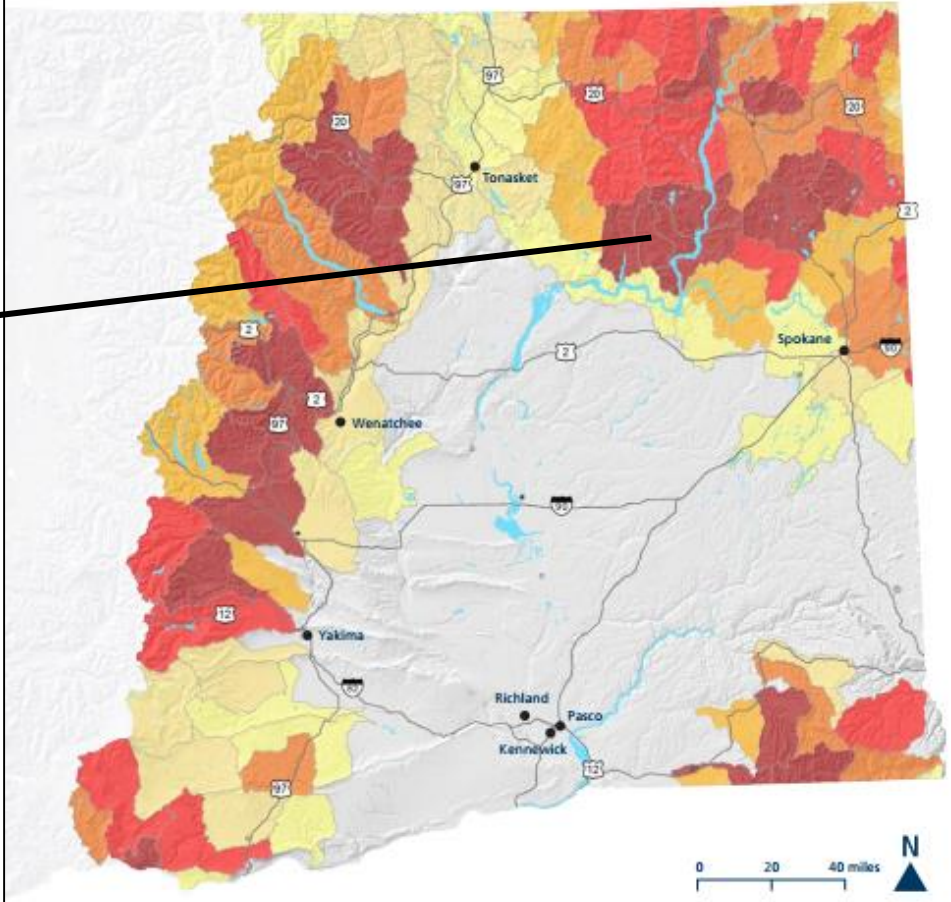
20-YEAR FOREST HEALTH STRATEGIC PLAN
EASTERN WASHINGTON

NEAR-TERM ACTIONS

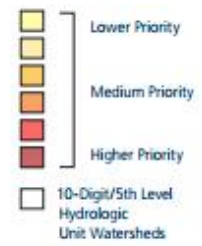
- 1 Identify Planning Areas
- 2 Conduct Landscape Evaluations
- 3 Develop Landscape Prescriptions
- 4 Develop a Prioritized List of Treatments for Appropriations Request

	Jan	Feb	March	April	May	June	July	August	Sept - Oct
<i>Select Planning Areas</i>									
<i>Landscape Evaluations</i>									
<i>Landscape Rx & Treatment Areas</i>									
<i>Appropriations Request</i>									

Next steps: Select planning areas & conduct landscape evaluations



EASTERN WASHINGTON FOREST HEALTH PRIORITY HUC 5 WATERSHEDS



HUC: Hydrologic unit code. The U.S. Geological Survey developed this classification system as a way to categorize watersheds. The smaller the number, the bigger the geography, (e.g. HUC 1, HUC 2, HUC 3, HUC 4, HUC 5, HUC 6) Average HUC 6 watershed is approximately 20,000 acres. Average HUC 5 watershed is approximately 150,000 acres.

Step 1: Identify Planning Areas within a HUC 5 Watershed

1 Local Consultation

- Public land managers, Collaboratives, Tribes, other stakeholders
- DNR conducts data driven prioritization to help select planning areas
- Select 1-? planning areas per collaborative area
- Based on combination of prioritization scores, local input and priorities, and agency planning efforts.

2 Forest Health Advisory Committee Recommendations

- Review local recommendations
- Make statewide recommendations to Commissioner

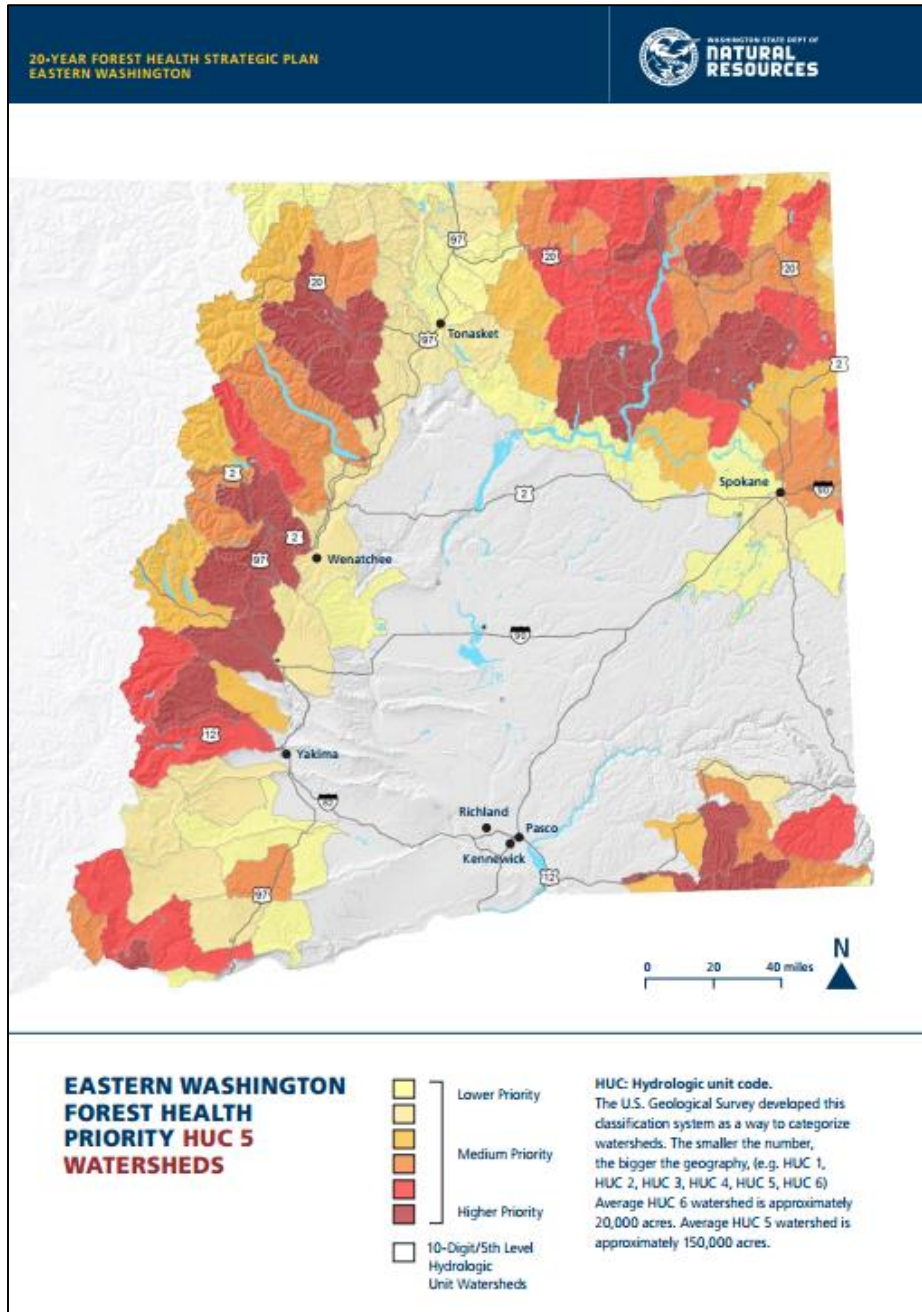
3 Commissioner of Public Lands Selection

- Final selection

HUC 5 Prioritization from 20 Year Plan

1. Select planning areas

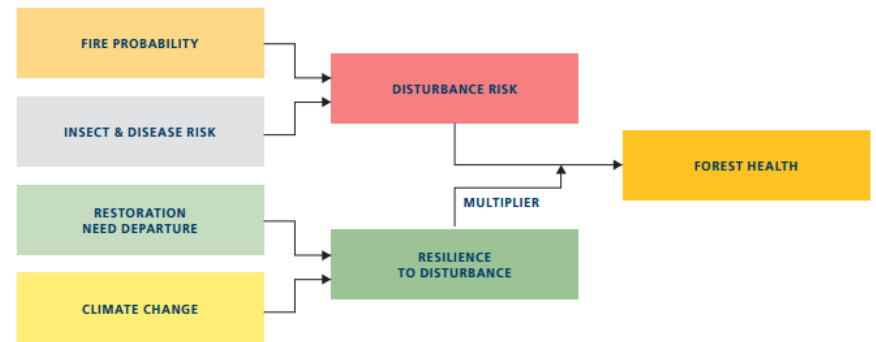
- 1 or more HUC 6 watersheds
- Data driven prioritization: HUC 6 level
 - Same framework and methods as HUC 5 prioritization
 - Most of the same datasets, but several changes and additions
 - All datasets and scores available to local stakeholders. Report sent to committee.
- Combine with Local input



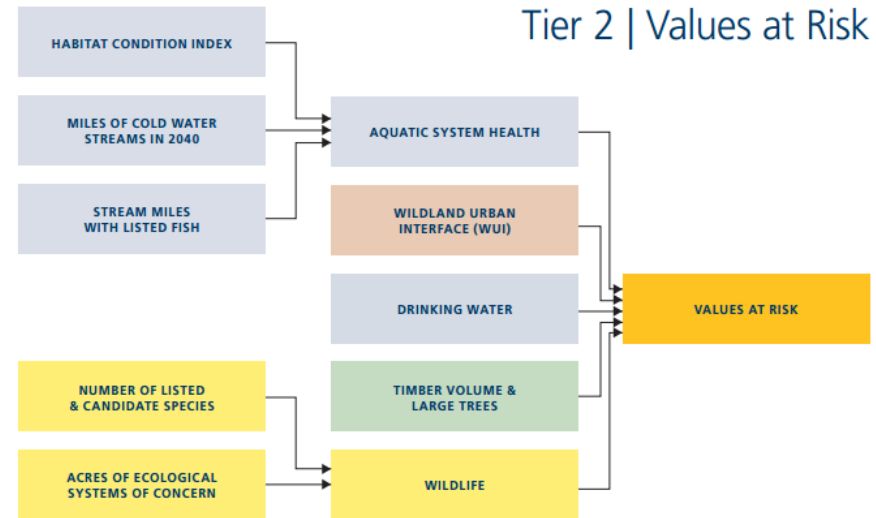
Data Driven HUC 6 Prioritization

- HUC 6 level, but planning areas may cover more than one HUC 6.
- Same framework and methods as HUC 5 prioritization
- Most of the same datasets, but several changes and additions: **Access**
- All datasets and scores available to local stakeholders

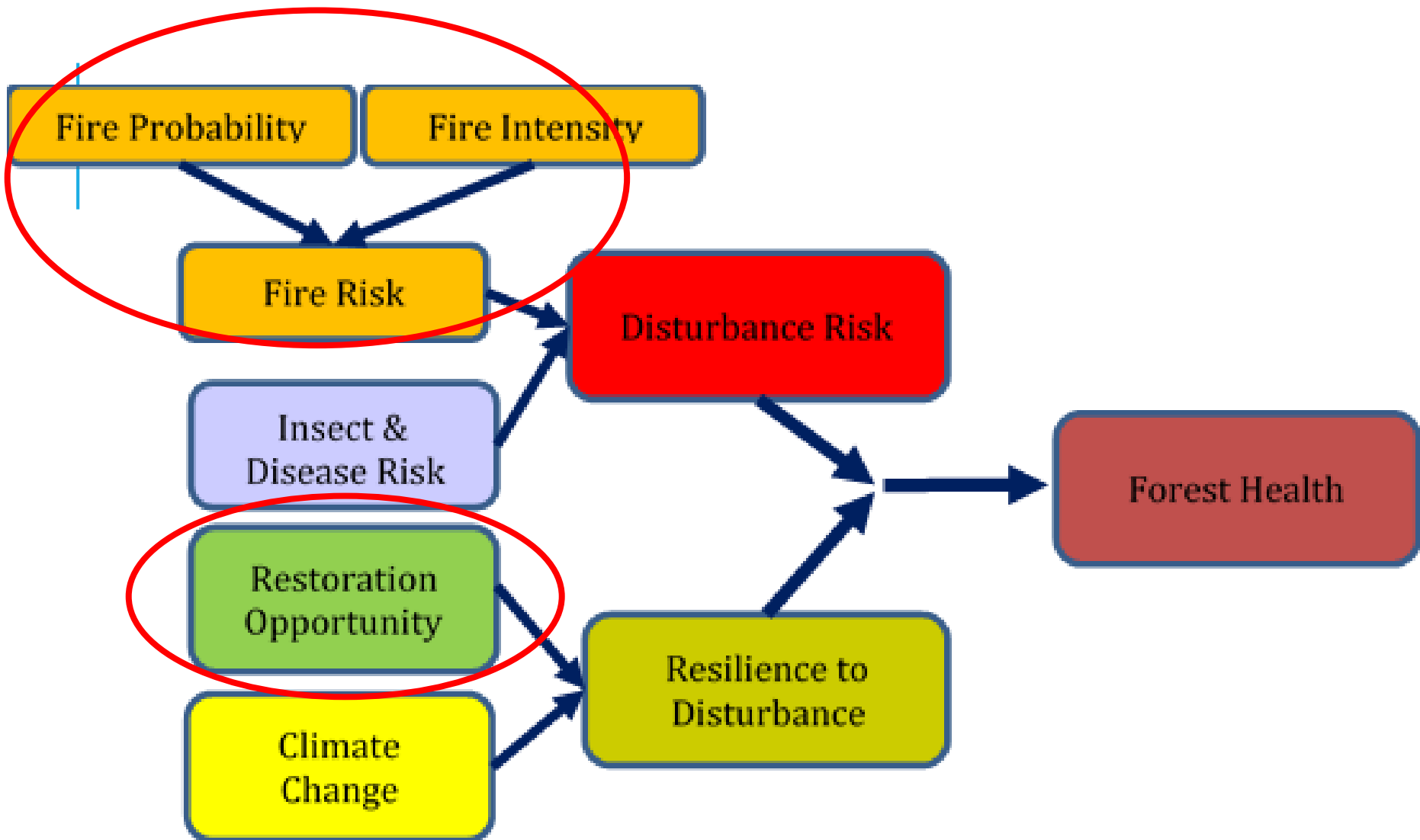
Tier 1 | Forest Health



Tier 2 | Values at Risk

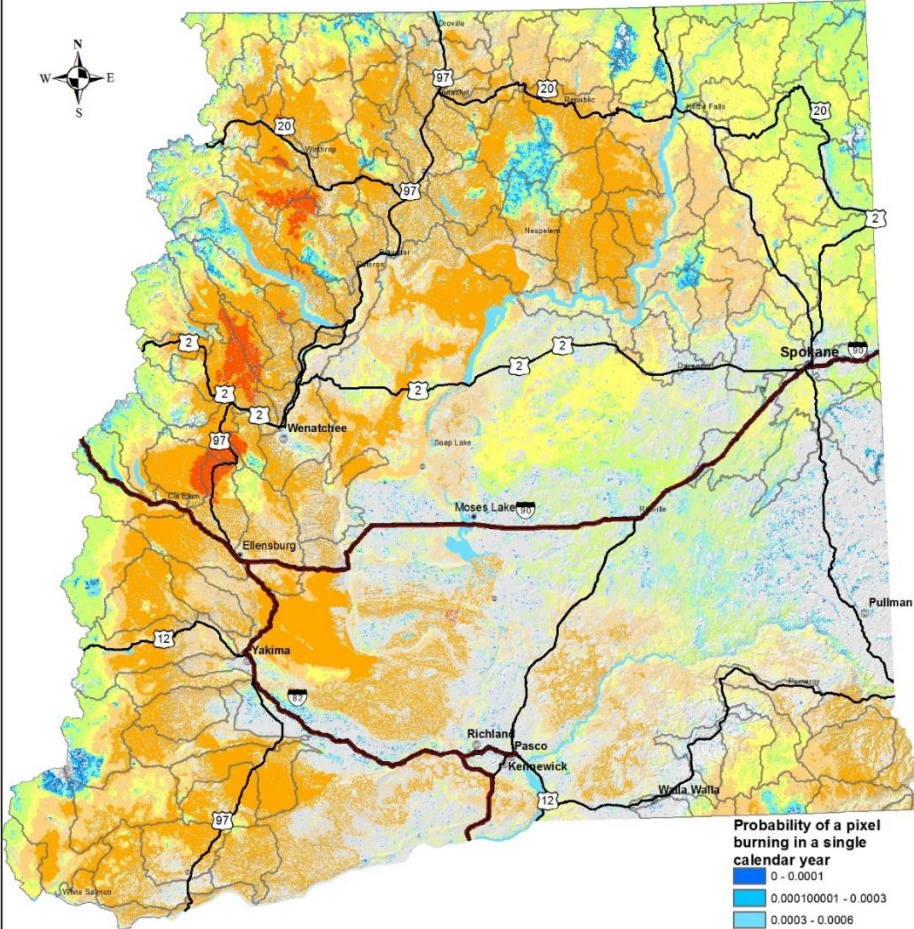


Tier 1: Forest Health



Tier 1: Fire Probability

Fire Probability



Probability of a pixel burning in a single calendar year

0 - 0.0001
0.000100001 - 0.0003
0.0003 - 0.0006
0.0006 - 0.001
0.001000001 - 0.003
0.003 - 0.006
0.006 - 0.01
0.010000001 - 0.03
0.03 - 0.047348

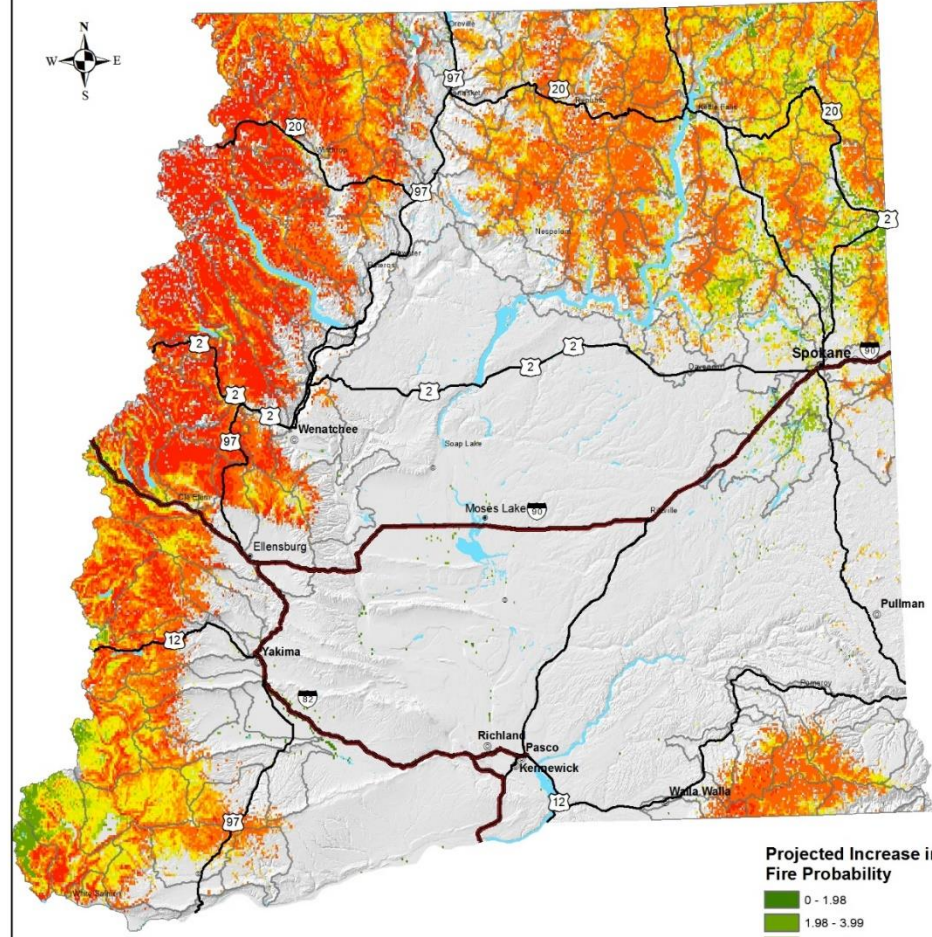
10-digit/5th level hydrologic unit watersheds

WILDFIRE
Map by A. Dozic

0 5 10 20 30 40 Miles

Quantitative Wildfire Risk Assessment for Oregon and Washington. USFS Pacific NW & Alaska Regions/BLM State Office. Portland, OR. Project Manager: Rick Stratton

Projected Increase in Fire Probability: 1981-2010 period to 2041-2070 period



Projected Increase in Fire Probability

0 - 1.98
1.98 - 3.99
3.99 - 4.96
4.96 - 5.92
5.92 - 6.97
6.97 - 7.94
7.94 - 8.98
8.98 - 10.99
10.99 - 16

10-digit/5th level hydrologic unit watersheds

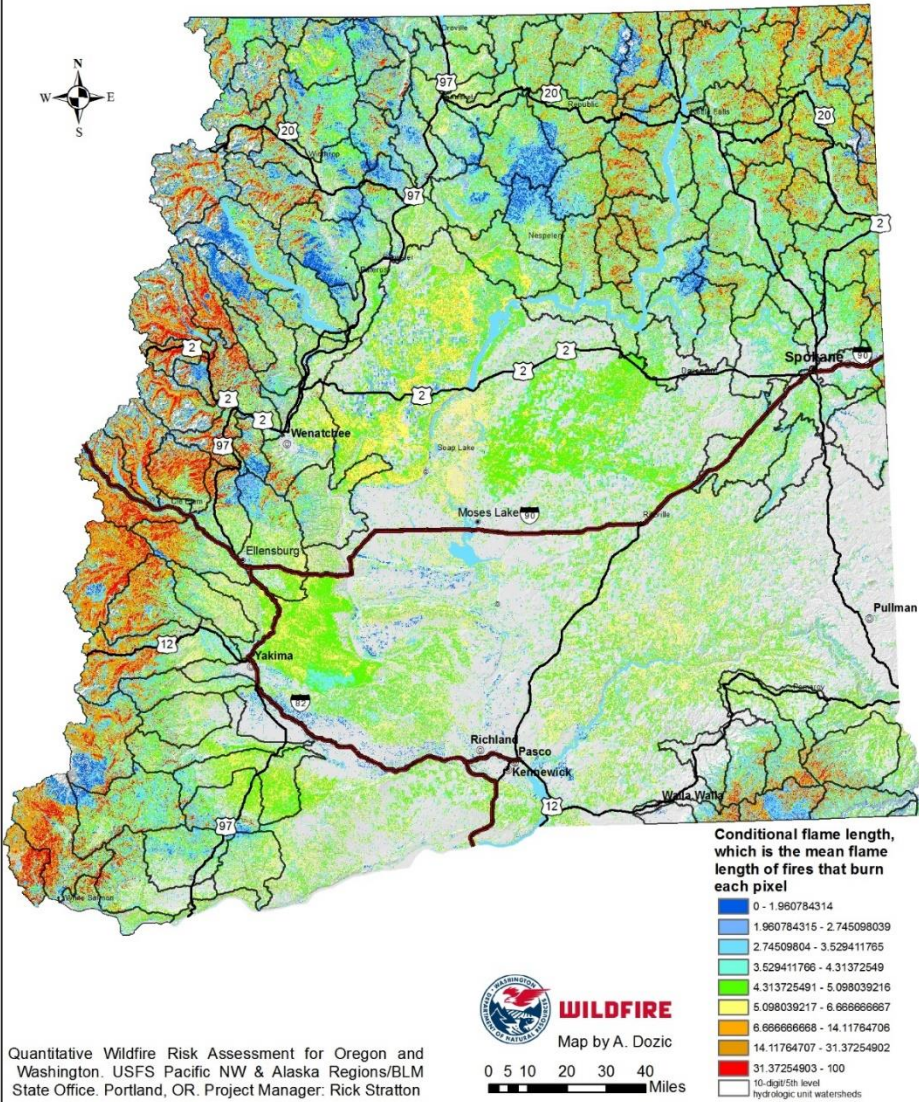
WILDFIRE
Map by A. Dozic

0 5 10 20 30 40 Miles

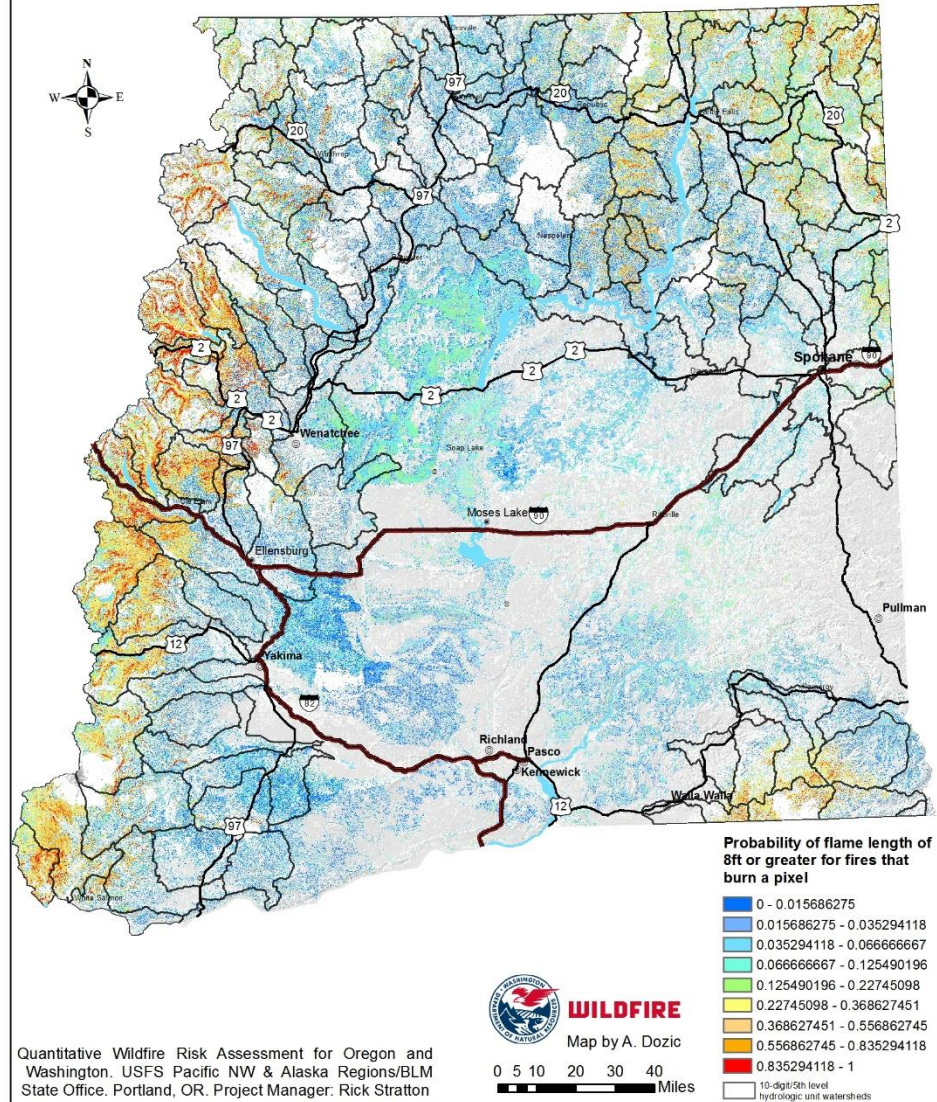
Source: Davis, R., Yang, Z., Yost, A., Belongie, C. & Cohen, W. 2017. The normal fire environmental Modeling environmental suitability for large forest wildfires using past, present, and future climate normals. Forest Ecology and Management 390, 173-186. Based on models of relative probability of large wildfire occurrence. Does not include fire severity

Tier 1: Fire Intensity

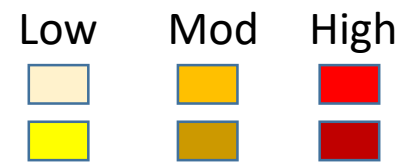
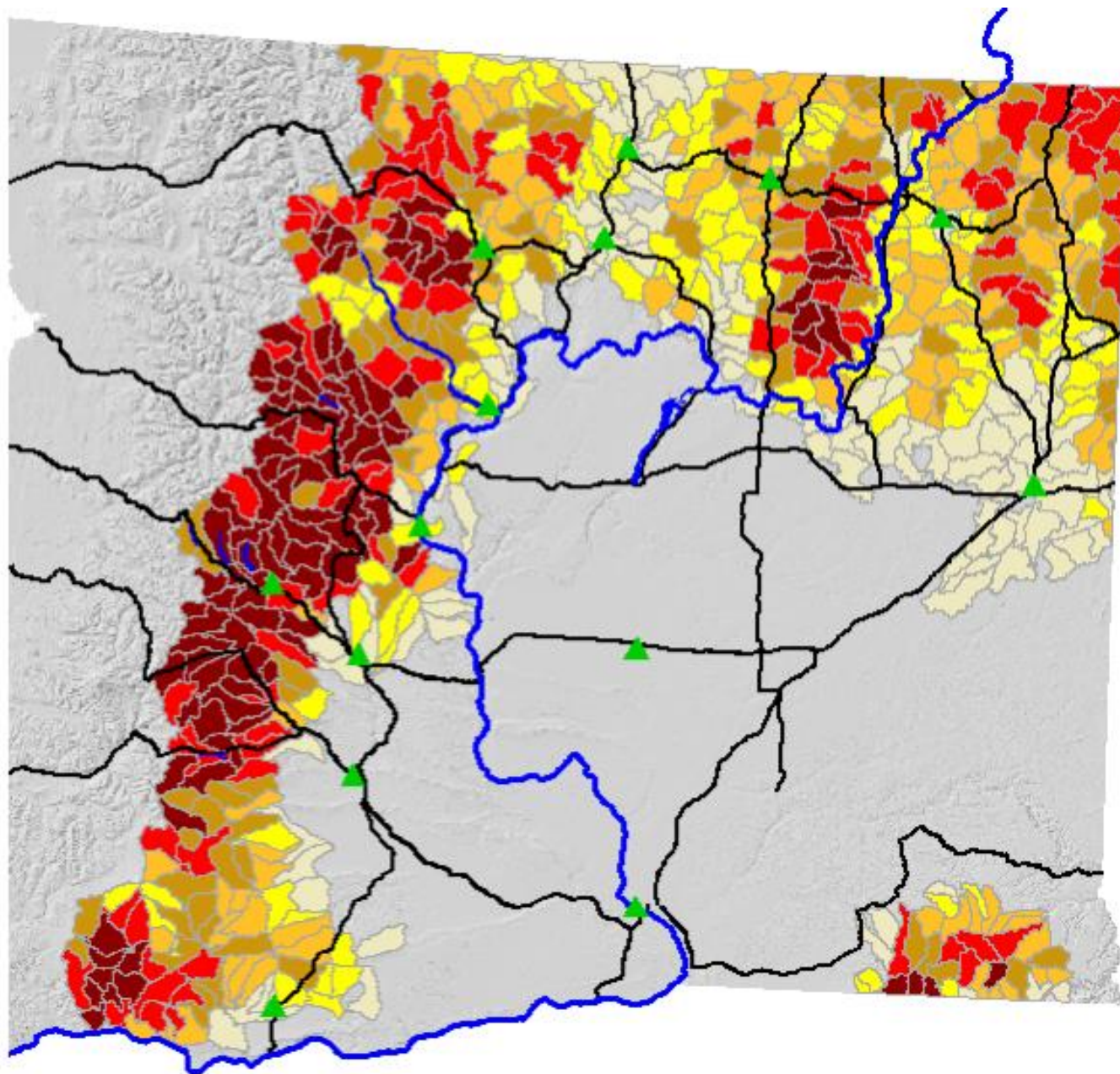
Fire Intensity: Average Flame Length



Probability of High Intensity Fire

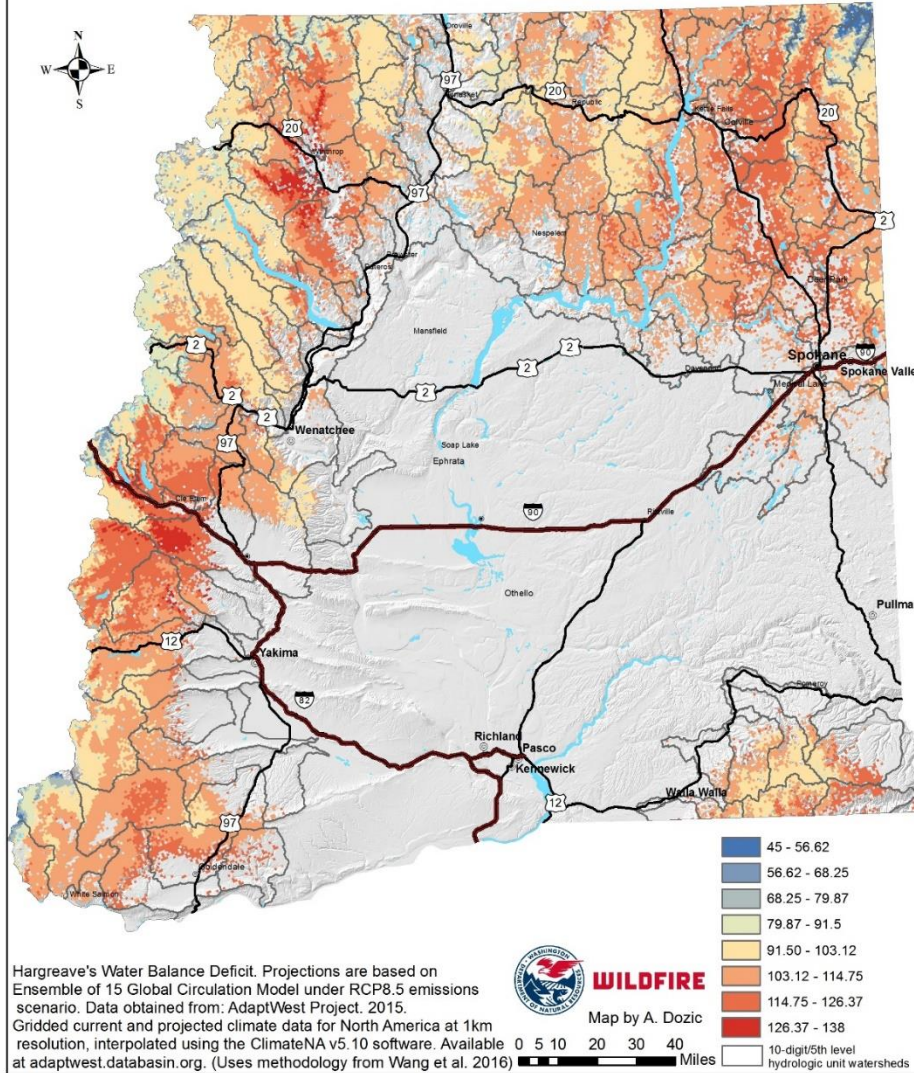


Tier 1: Fire Risk (Probability x Intensity)

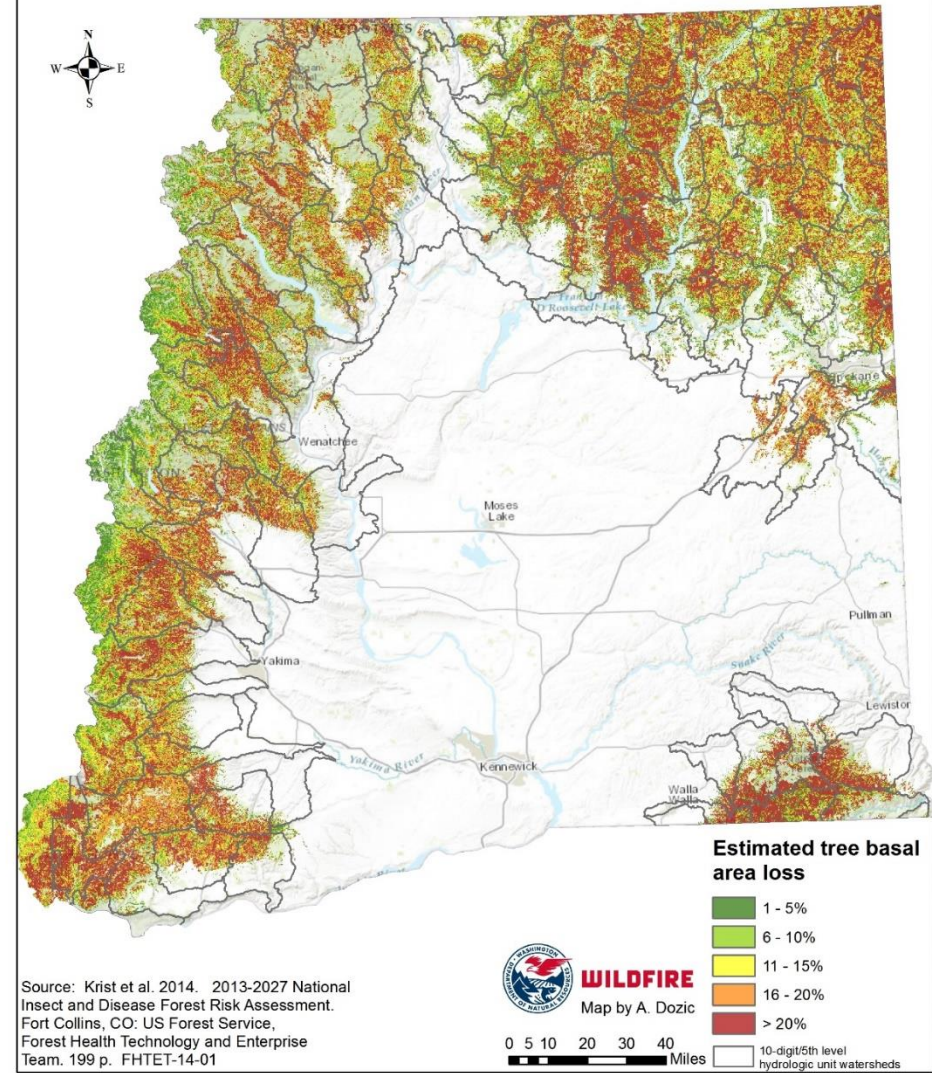


Tier 1: Climate Change – Insect & Disease

**Climate Change Projections:
Increase in Water Balance Deficit from
1981-2010 period to 2041-2070 period**

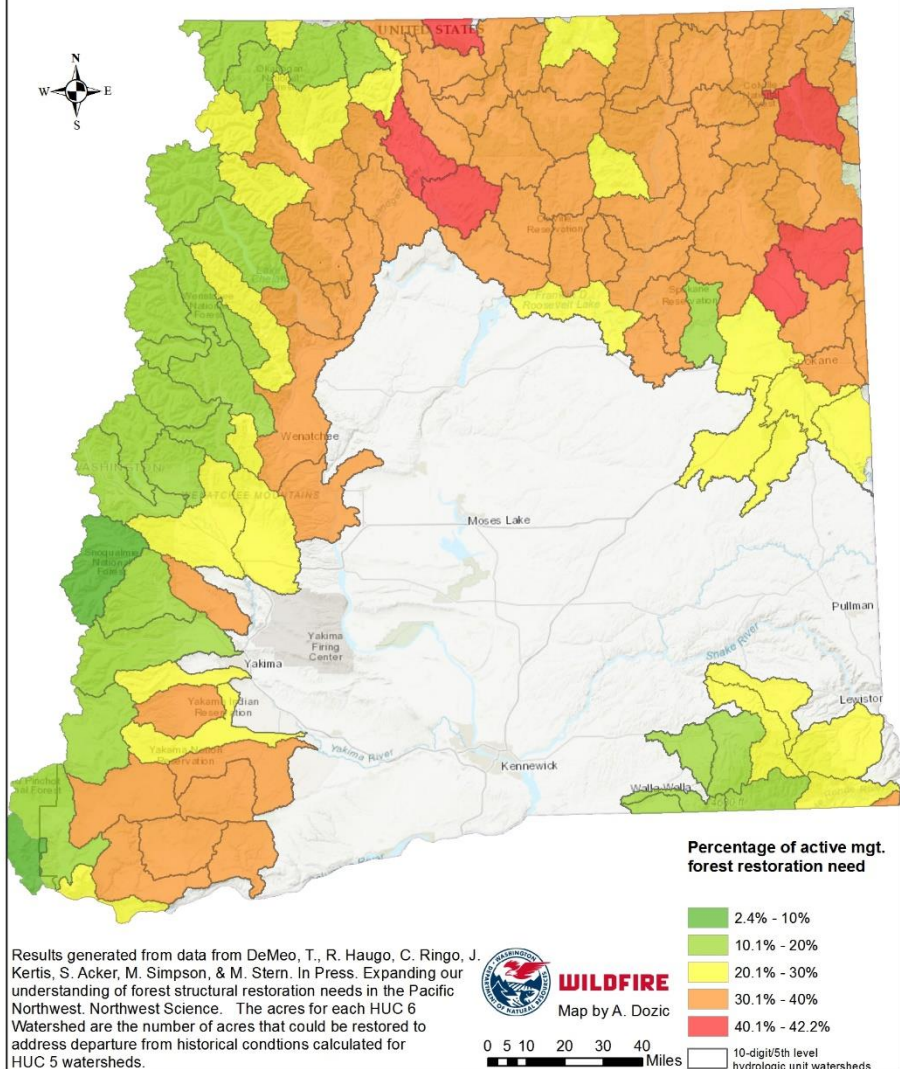


**National Forest Insect and Disease Risk Map
-Estimated tree basal area loss
-2013 to 2027-**

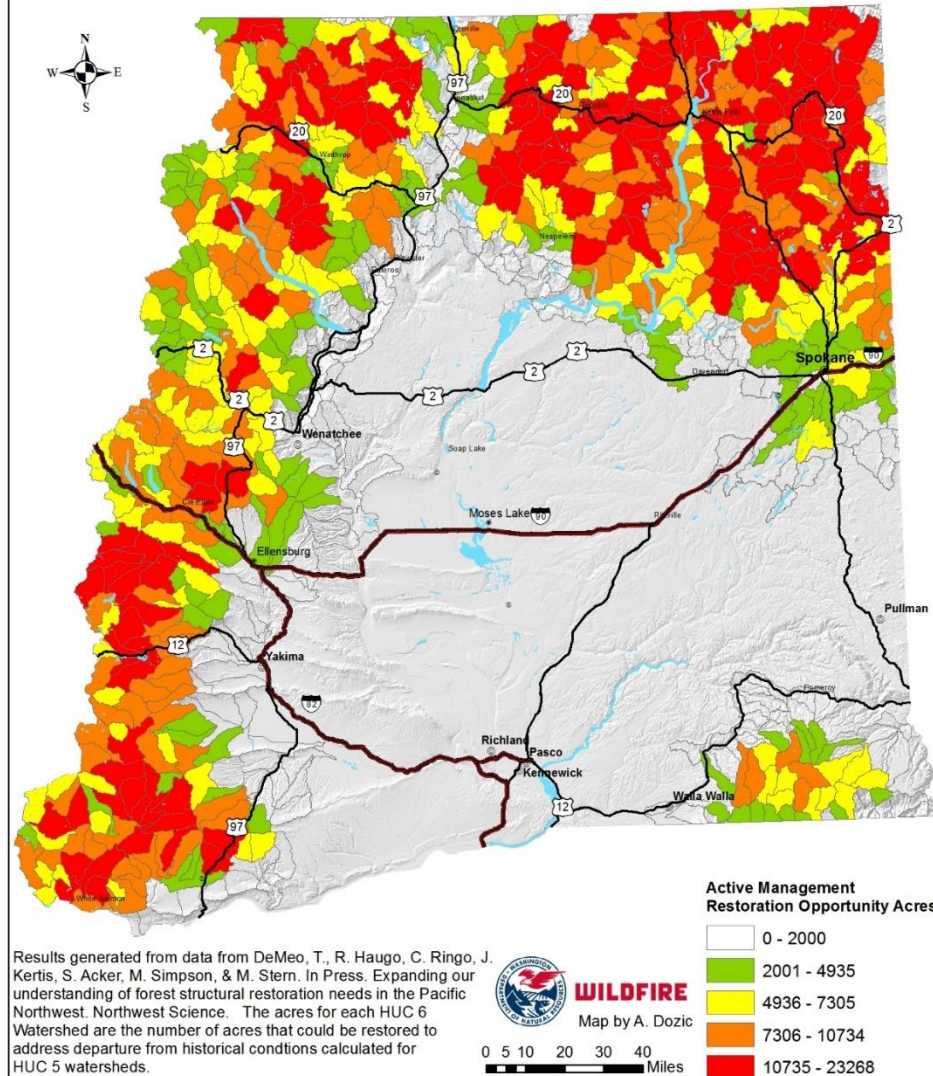


Tier 1: Departure & Restoration Opportunity

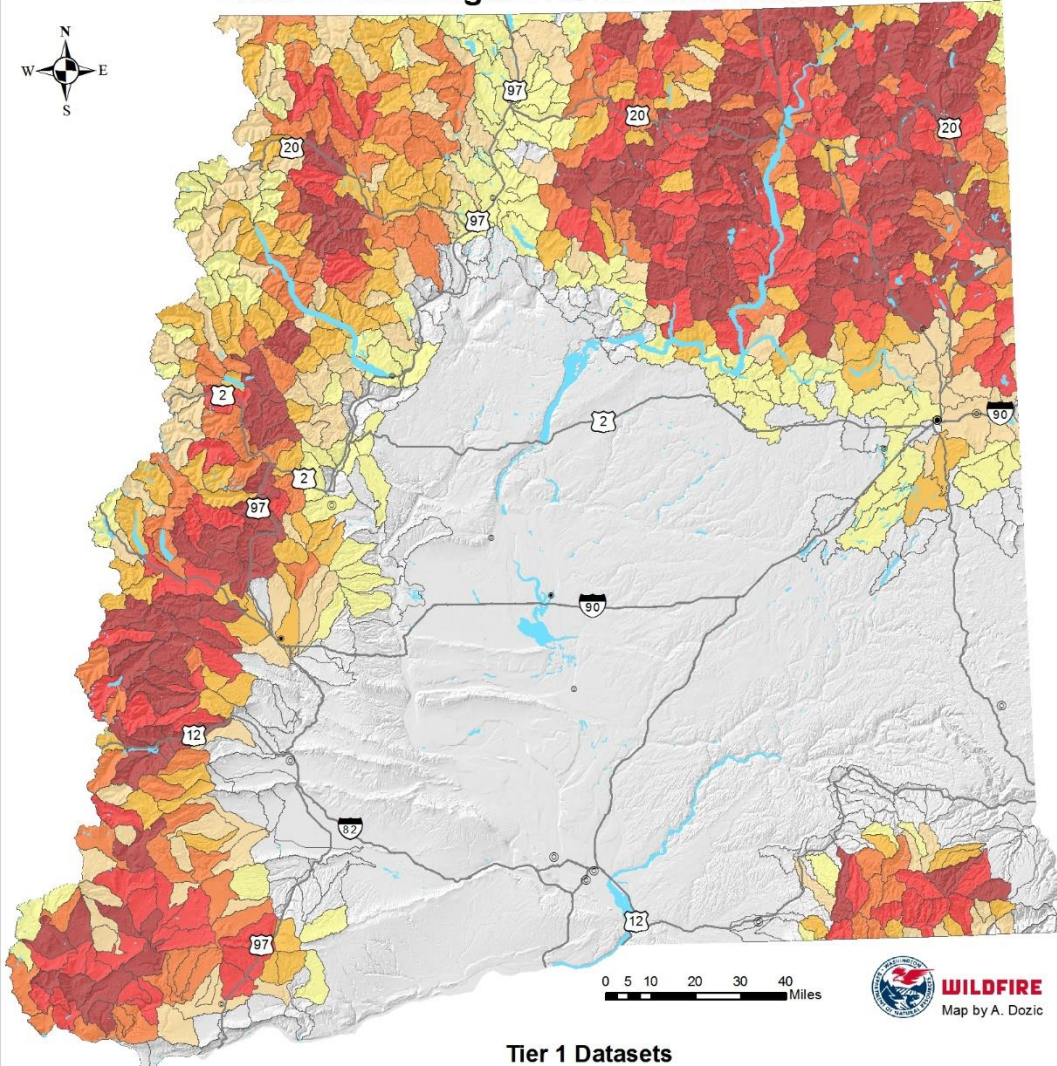
Active Management Restoration Opportunity Acres by HUC 5 Watershed



Active Management Restoration Opportunity Acres by HUC 6 Watershed



Forest Health/Wildfire Risks (Tier 1) Eastern Washington HUC6 Watersheds

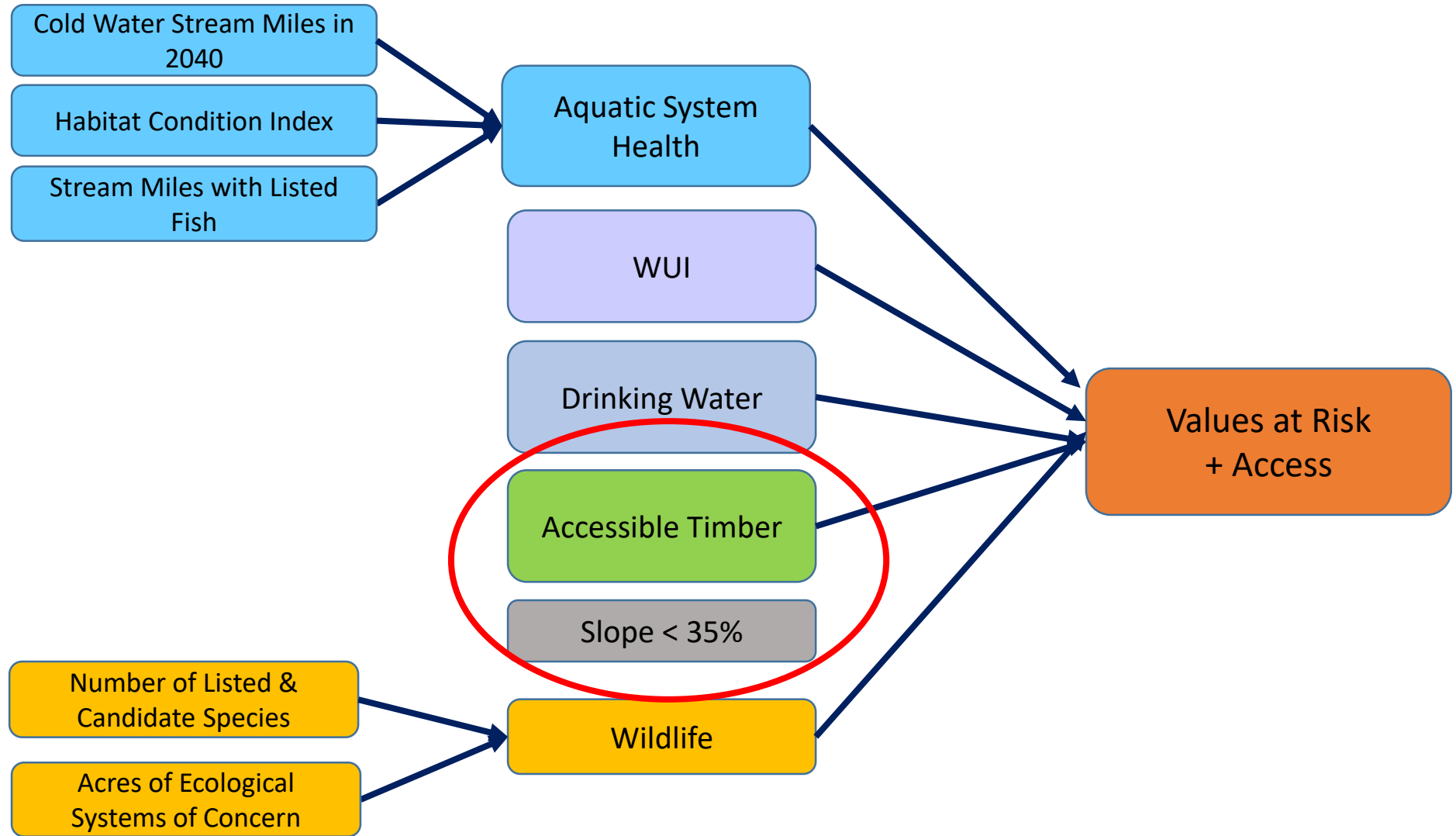


- Low Forest Health/Wildfire Risk**
- Medium Forest Health/Wildfire Risk**
- High Forest Health/Wildfire Risk**
- 12-digit/6th level**
- hydrologic unit watersheds**

Tier 1 Datasets

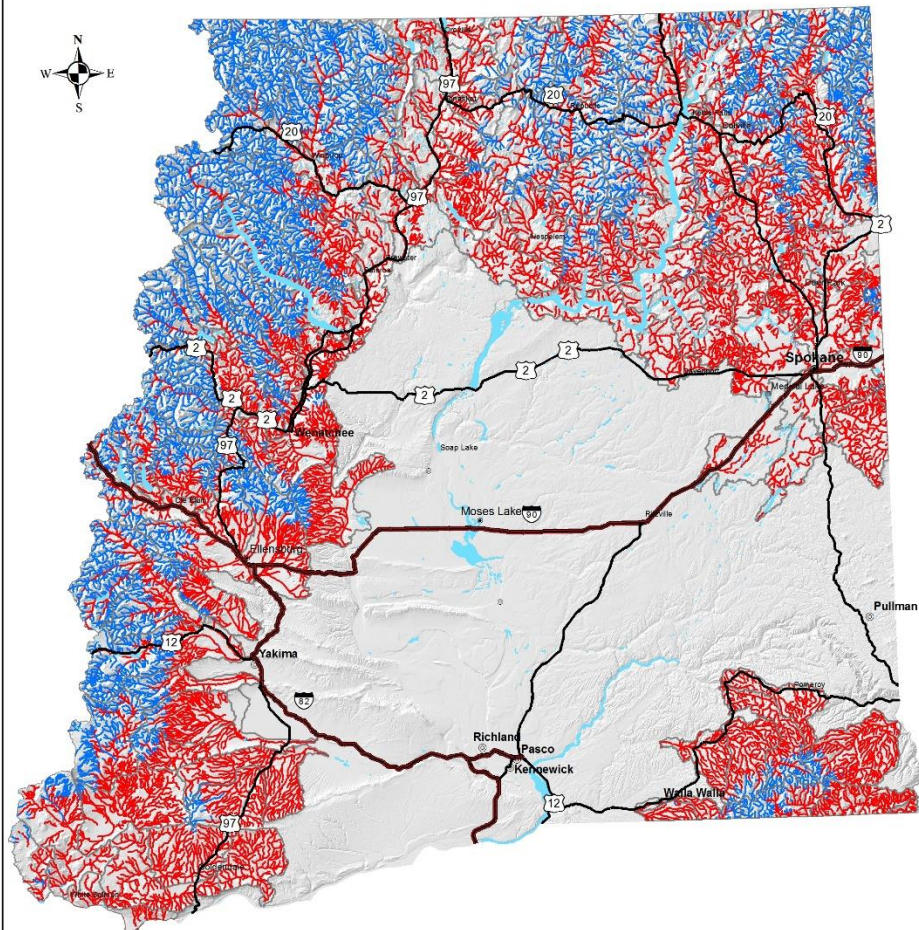
- Fire Probability: Average of Fire Threat Index from Westwide Wildfire Risk Assessment, large fire probability (Davis et. al 2017), and burn probability from Quantitative Wildfire Risk Assessment for OR and WA (USFS Region 6 2017)
- Insect and Disease Risk: National Insect and Disease Risk Map (Krist et al. 2014)
- Active Restoration Need: TNC and USFS Restoration Needs Analysis (Haugo et al. 2015)
- Climate Change: Increase in Water Balance Deficit (AdaptWest 2015)

Tier 2: Values at Risk + Access



Tier 2: Aquatic Systems

Projected Maximum Stream Temperature in 2040



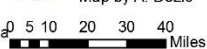
Source: Modeled Stream Temperature Scenario Maps, Isaak, D.J.; Wenger, S.J.; Peterson, E.E.; Ver Hoef, J.M.; Hostetler, S.W.; Luce, C.H.; Dunham, J.B.; Kershner, J.L.; Roper, B.B.; Nagel, D.E.; Chandler, G.L.; Wollrab, S.P.; Parkes, S.L.; Horan, D.L. 2016. NorWeST modeled summer stream temperature scenarios for the western U.S. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2016-0033>.



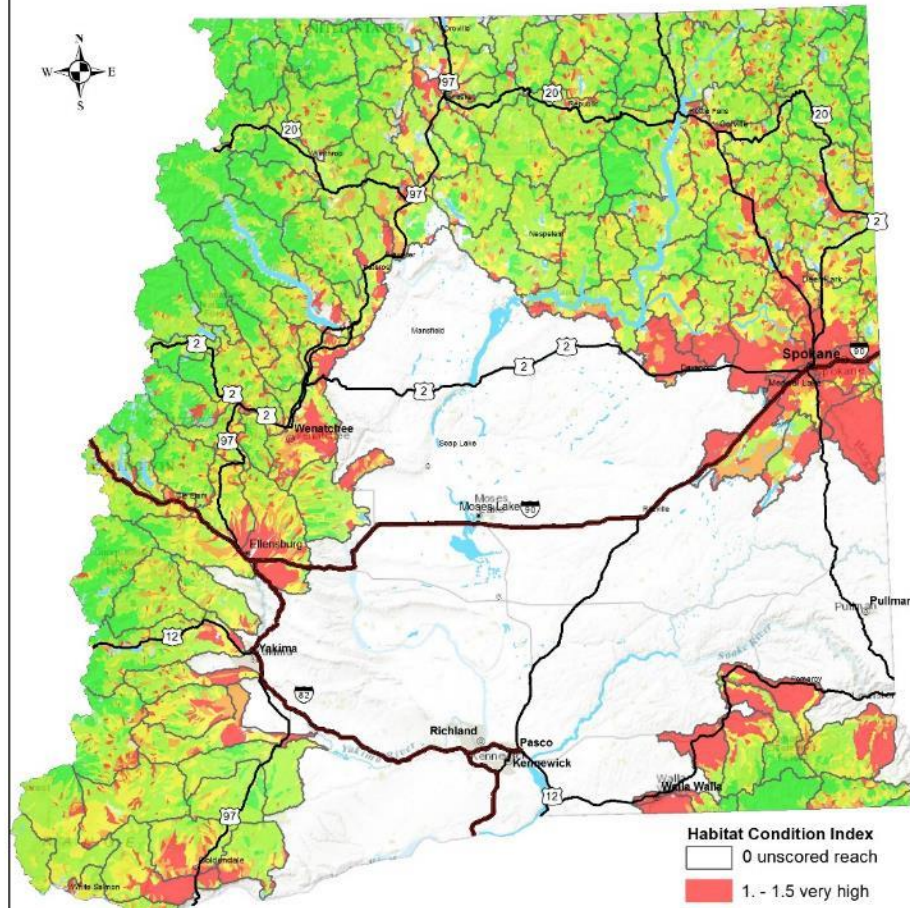
Map by A. Dozic

Legend

- Temp <16C
- Temp >16C
- 10-digit/5th level hydrologic unit watersheds



Habitat Condition Index National Fish Habitat Action Plan

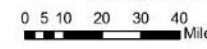


Source: Habitat Condition and Disturbance Data from 2010 NFHP National Assessment Esselman, P., D.M. Infante, L. Wang, W. Taylor, W. Daniel, R. Tingley, J. Fenner, A. Cooper, D. Wieferich, D. Thornbrugh and J. Ross. (April 2011) National Fish Habitat Action Plan (NFHAP) 2010 HCI Scores and Human Disturbance Data (linked to NHDPLUSV1) for Washington. National Fish Habitat Partnership Data System. <http://dx.doi.org/doi:10.5066/F77S7K5Q>



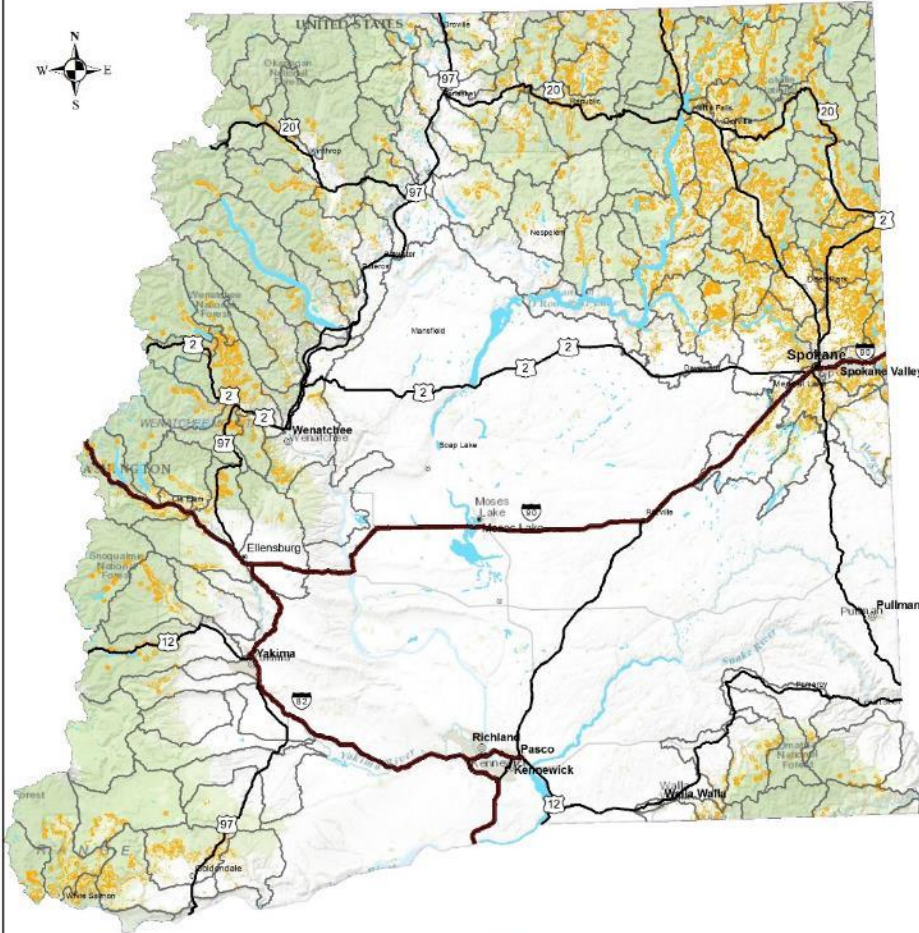
Map by A. Dozic

- ### Habitat Condition Index
- 0 unscored reach
 - 1. - 1.5 very high
 - 1.51 - 2.5 high
 - 2.51 - 3.5 moderate
 - 3.51 - 4.33 low
 - 4.34 - 5.0 very low
 - 10-digit/5th level hydrologic unit watersheds



Tier 2: WUI & Drinking Water

Forested Wildland Urban Interface (WUI)



Source: This dataset was created by buffering all values of the Where People Live dataset used in the Westwide Wildfire Risk Assessment by 0.5 miles and then intersecting the buffered Where People Live dataset with forest land. This forested WUI layer was created to develop an estimate of forestland within the wildland urban interface

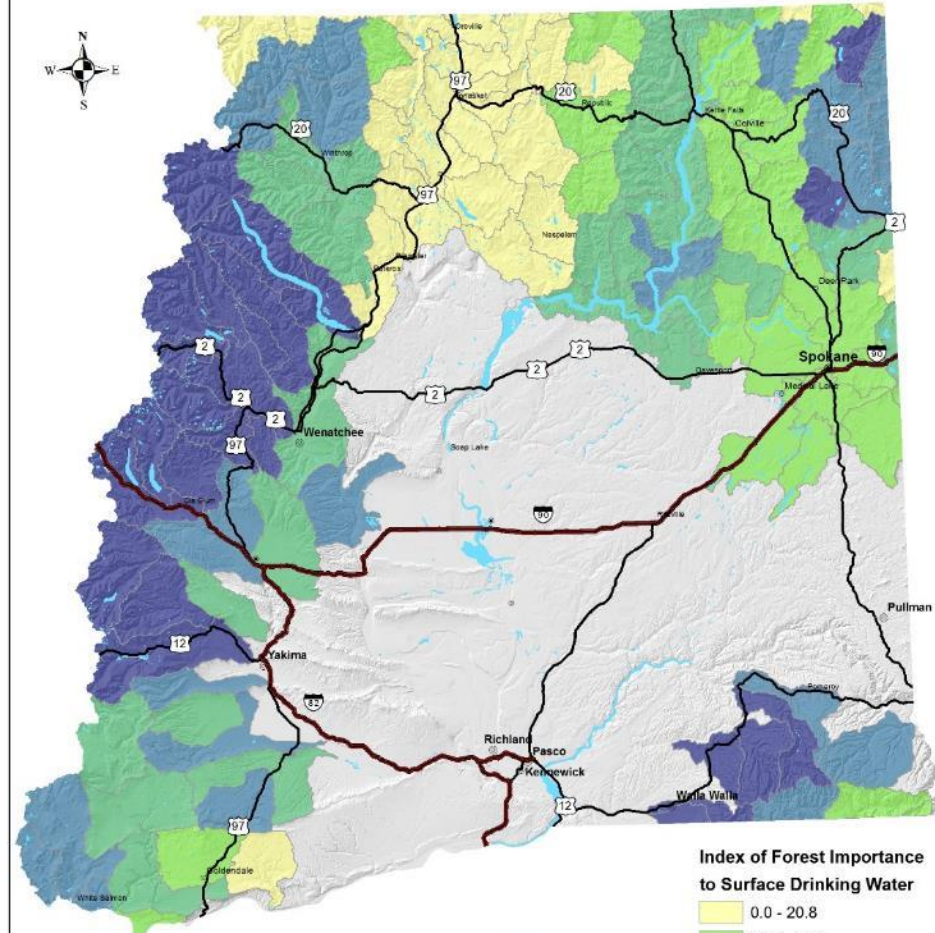
WILDFIRE
Map by A. Dozic

0 5 10 20 30 40 Miles

Forested Wildland Urban Interface (WUI)

- Forested WUI
- 10-digit/5th level hydrologic unit watersheds

Forests to Faucets Index of Forest Importance to Surface Drinking Water



Source: USDA
https://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml

WILDFIRE
Map by A. Dozic

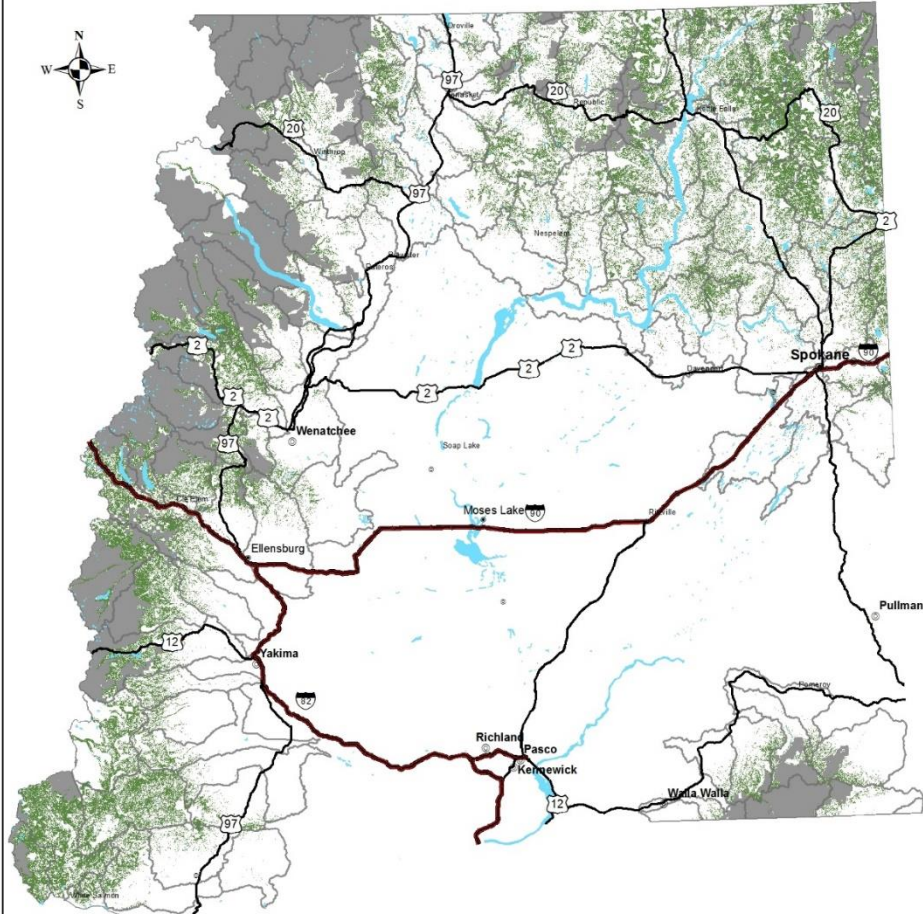
0 5 10 20 30 40 Miles

Index of Forest Importance to Surface Drinking Water

- 0.0 - 20.8
- 20.8 - 27.4
- 27.4 - 37.0
- 37.0 - 52.8
- 52.8 - 83.87
- 10-digit/5th level hydrologic unit watersheds

Tier 2: Timber Volume and Access

Potential Commercial Treatment Acres within 1500' of Existing Roads



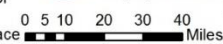
Source: Gradient Nearest Neighbor method (Ohmann & Gregory 2002, CJFR) for assigning forest inventory plot identities to unsampled (and sampled) spatial locations. Conversion from m³/ha to bf/acre done by referring to Measuring Timber Products Harvested from Your Woodland (P. Oester and S. Bowers) page 7 Table 4. Commercial volume is based on volume greater than 12 mbf/acre within 1,500 ft of a road. DNR road layers can be found: http://data-wadnr.opendata.arcgis.com/datasets?group_ids=878cfb11b9b04c35b0c966474efeeace



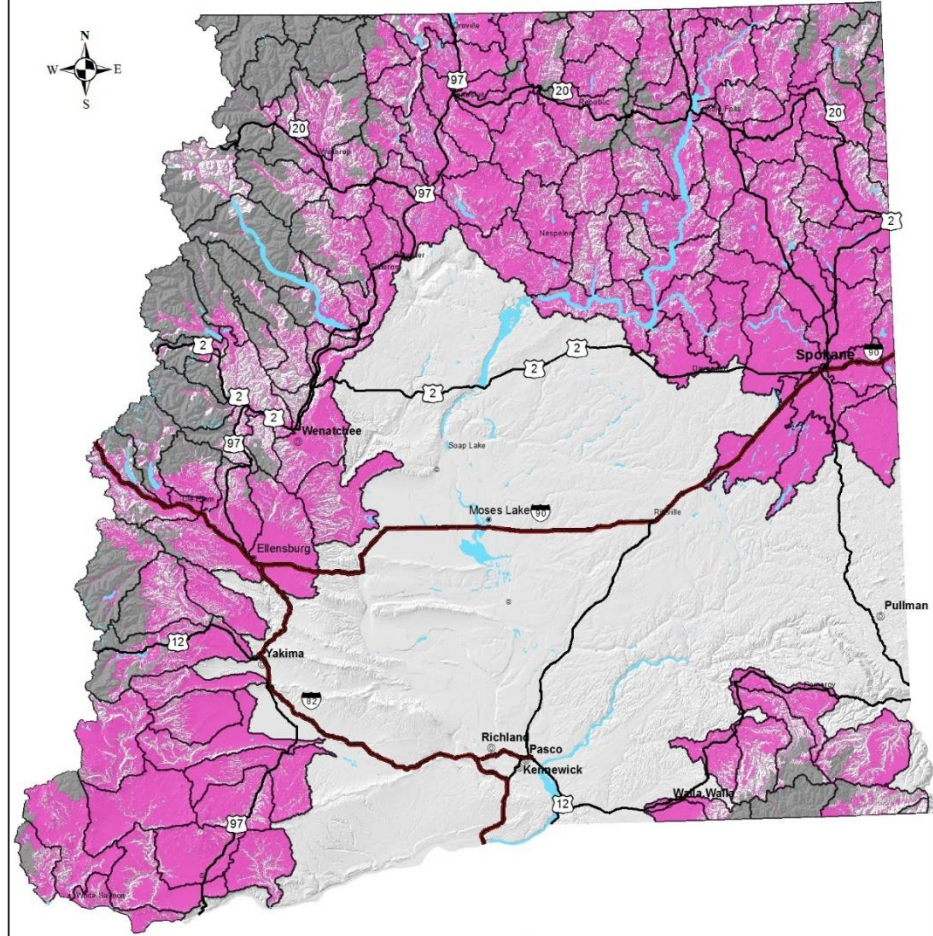
WILDFIRE

Map by A. Dozic

- volume greater than 12mbf/acre within 1,500 ft of a road
- Wilderness-Roadless
- 10-digit/5th level hydrologic unit watersheds



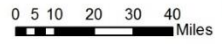
Area with Slope less than 35%



WILDFIRE

Map by A. Dozic

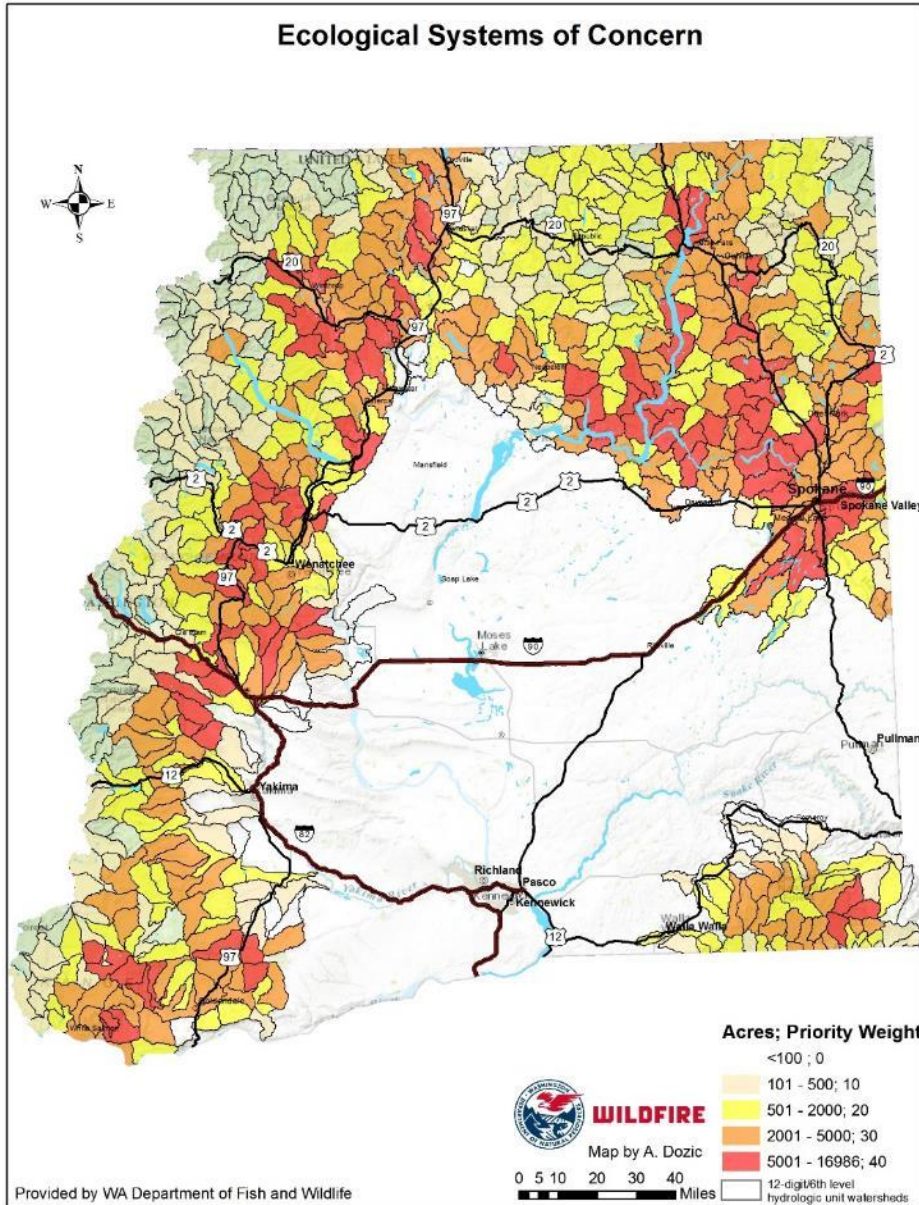
- Wilderness-roadless
- Slope less than 35%
- 10-digit/5th level hydrologic unit watersheds



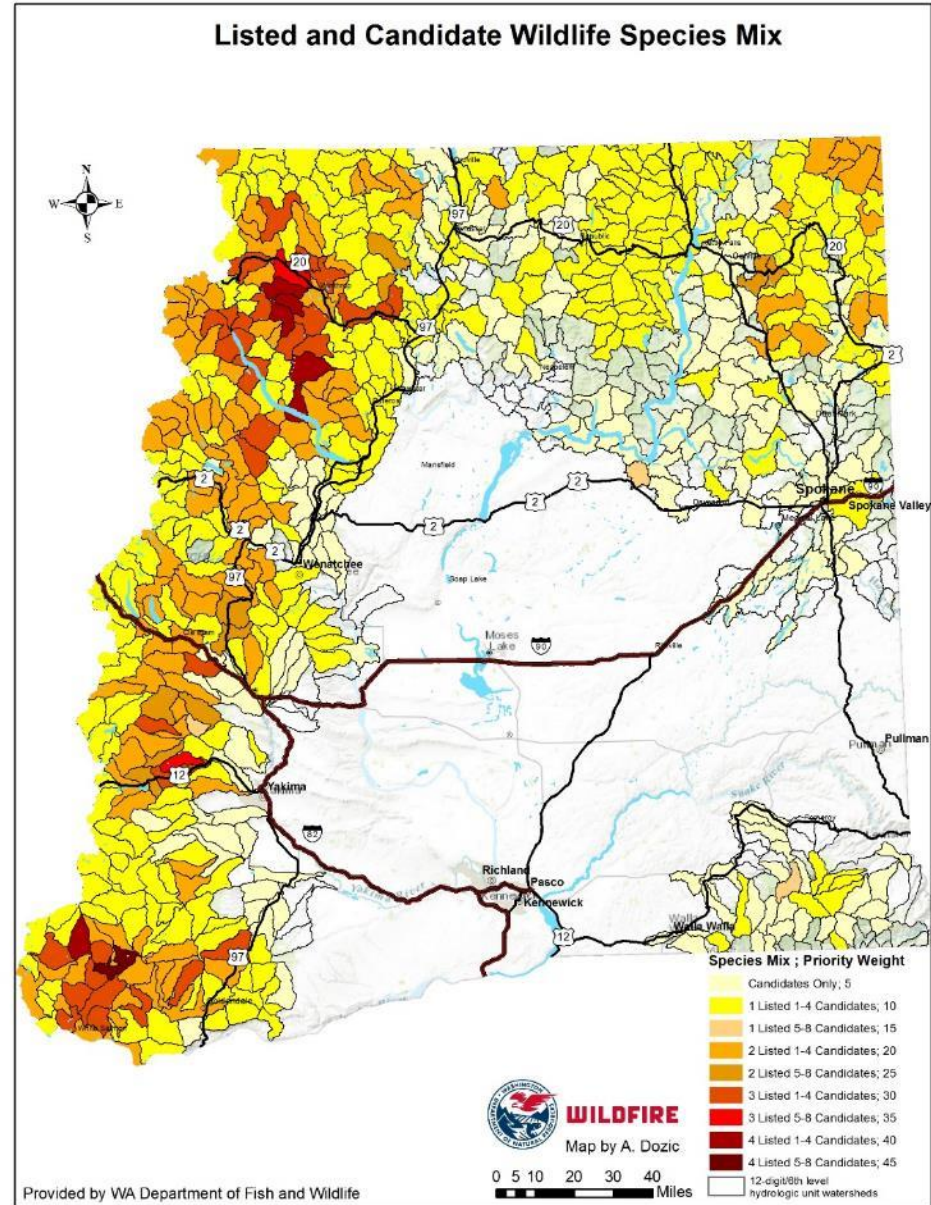
90m DEM of Washington USGS

Tier 2: Wildlife

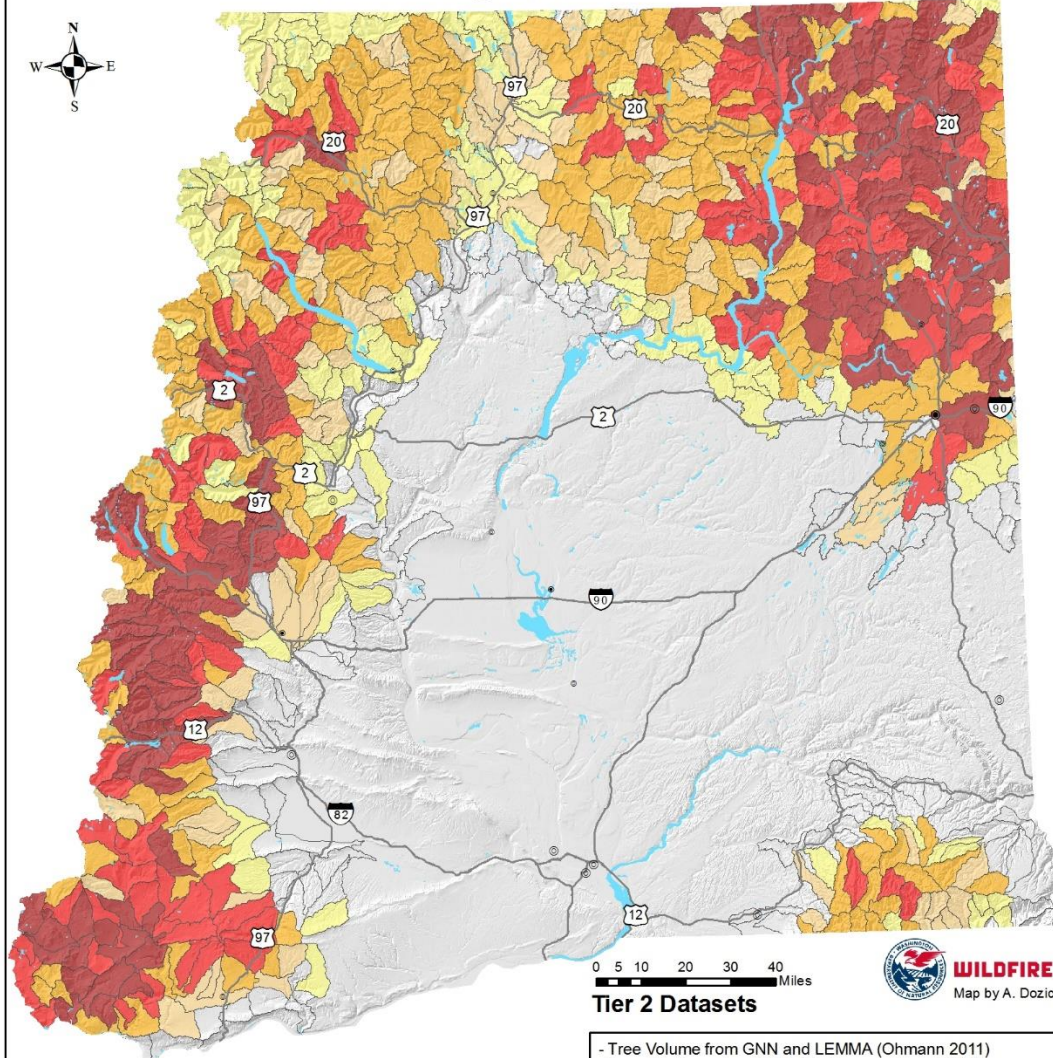
Ecological Systems of Concern



Listed and Candidate Wildlife Species Mix



Values at Risk (Tier 2) Eastern Washington HUC6 Watersheds



- Low Values at Risk
- Medium Values at Risk
- High Values at Risk
- 12-digit/6th level hydrologic unit watersheds

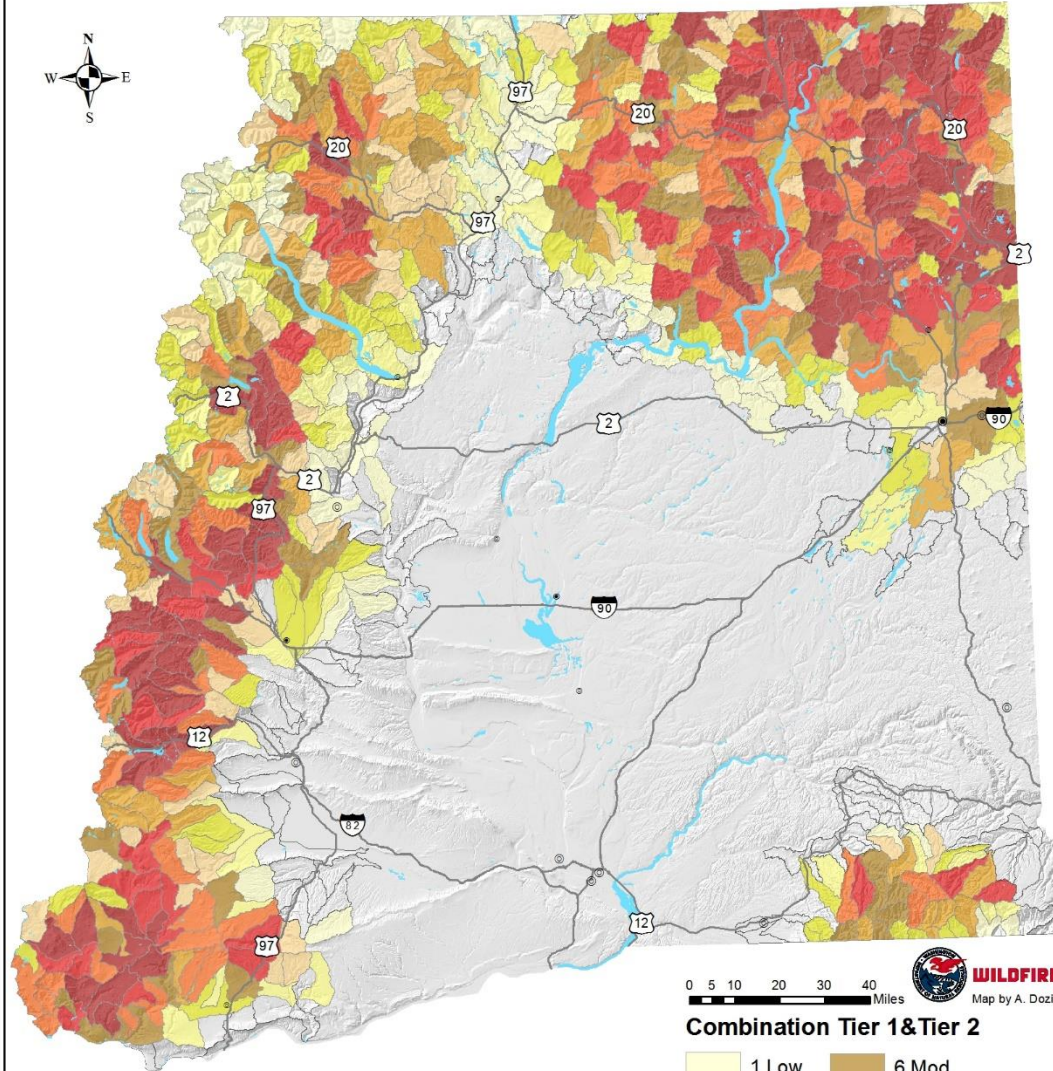


0 5 10 20 30 40 Miles

Tier 2 Datasets

- Tree Volume from GNN and LEMMA (Ohmann 2011)
- Forest to Faucets, USFS (Weidner and Todd 2011)
- Forested Wildland Urban Interface (DNR, derived from Where People Live Dataset)
- Wildlife Datasets:
 - Ecological Systems of Concern (WDFW)
 - Listed and Candidate Wildlife Species Mix (WDFW)
- Aquatic Datasets:
 - Miles with Listed Fish Species (WDFW)
 - Habitat Condition Index, National Fish Habitat Action Plan (Esselman 2010)
 - Stream miles with Stream Temperature <16C in 2040, NorWest (Isaak et al. 2016)

Eastern Washington Forest Health Priority HUC6 Watersheds



This priority map is a composite reflecting the overlap of forest health/wildfire risks (Tier 1) and the values at risk (Tier 2). Tier 1 and Tier 2 scores were normalized on a 0-1 range and then added together, this ensured equal weight for each tier in the final composite. A low score does not mean a watershed has no forest issues or values at risk. Instead, it means that the metrics and overall needs are lower relative to other watersheds.

Combination Tier 1&Tier 2

1 Low	6 Mod
2 Low	7 High
3 Low	8 High
4 Mod	9 High
5 Mod	12-digit/6th level HUC <2,500 ac of Forest

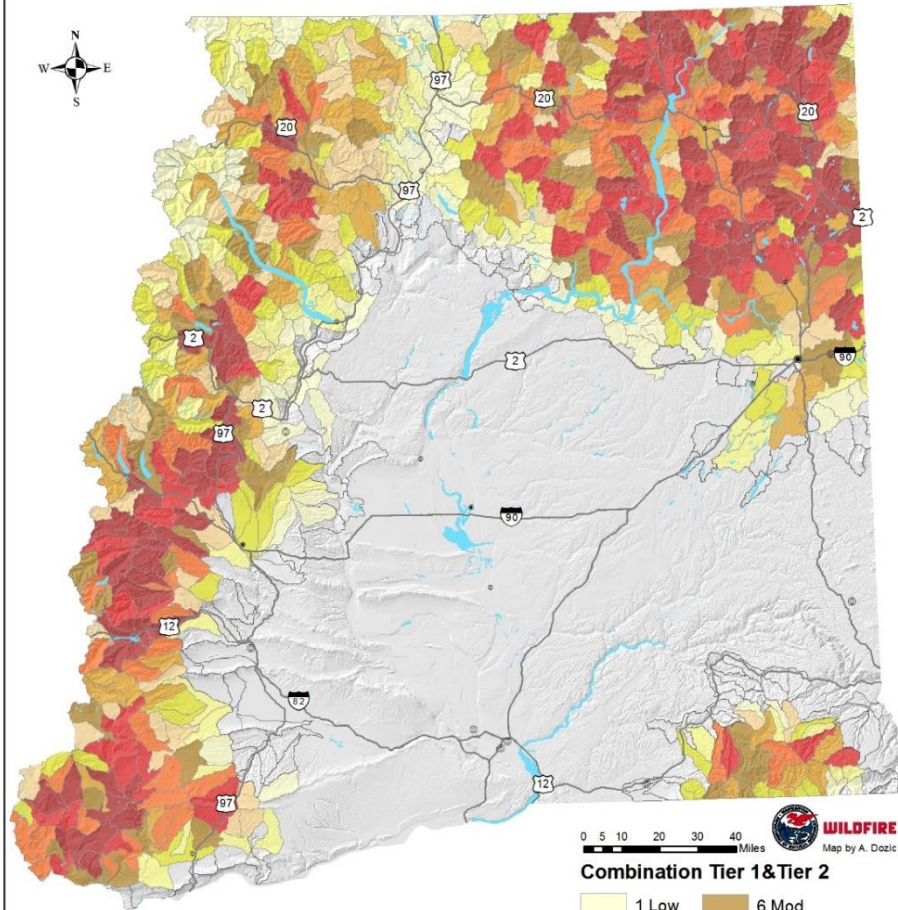
Eastern WA Forest Health Priority Watersheds

HUC 6 Level

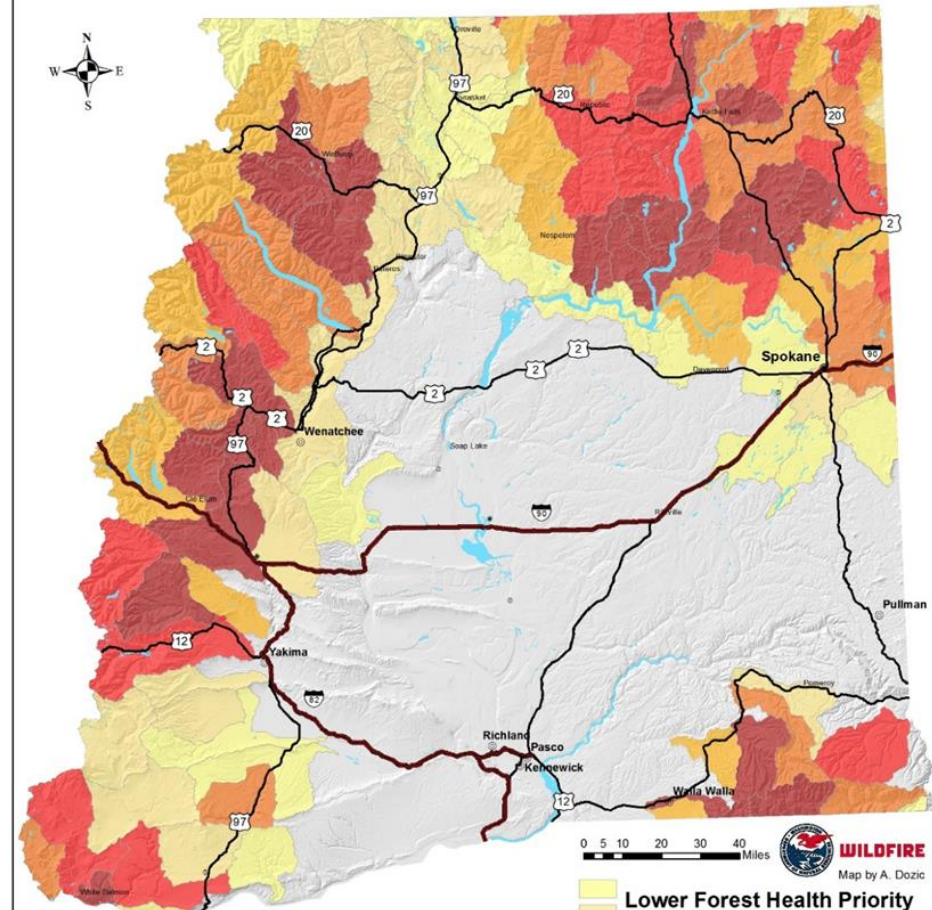
HUC 5 Level

Eastern Washington Forest Health Priority HUC6 Watersheds

Eastern Washington Forest Health Priority HUC5 Watersheds

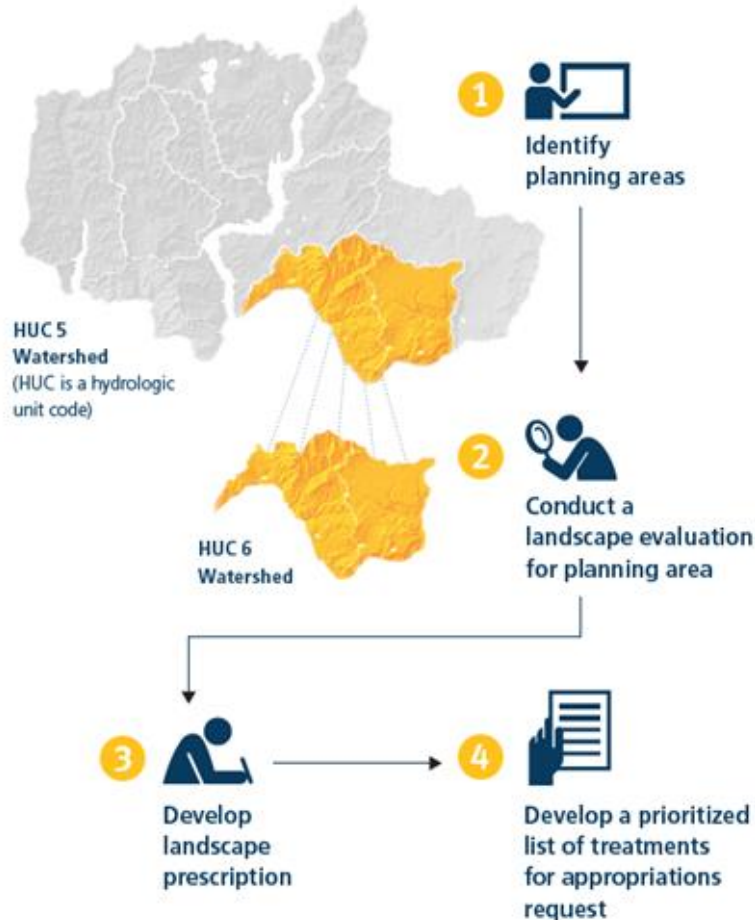


This priority map is a composite reflecting the overlap of forest health/wildfire risks (Tier 1) and the values at risk (Tier 2). Tier 1 and Tier 2 scores were normalized on a 0-1 range and then added together, this ensured equal weight for each tier in the final composite. A low score does not mean a watershed has no forest issues or values at risk. Instead, it means that the metrics and overall needs are lower relative to other watersheds.



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Draft Proposed Planning Areas



-DNR is currently in the process of selecting planning areas to assess forest health treatment needs.

-In January 2018, DNR met with USFS staff, forest collaboratives and other partners to get feedback on local forest health priority watersheds.

-DNR is presenting proposed planning areas based on local consultation and state HUC 6 forest health prioritization.

-DNR will be finalizing the proposed planning areas by mid-February.



DNR – Forest Service Engagement

Project Area Types

1. New Planning Area or very early USFS planning

- DNR → All lands landscape evaluation
Potentially request funding for NEPA planning. Request funding for non-federal treatments.

2. Mid course NEPA planning

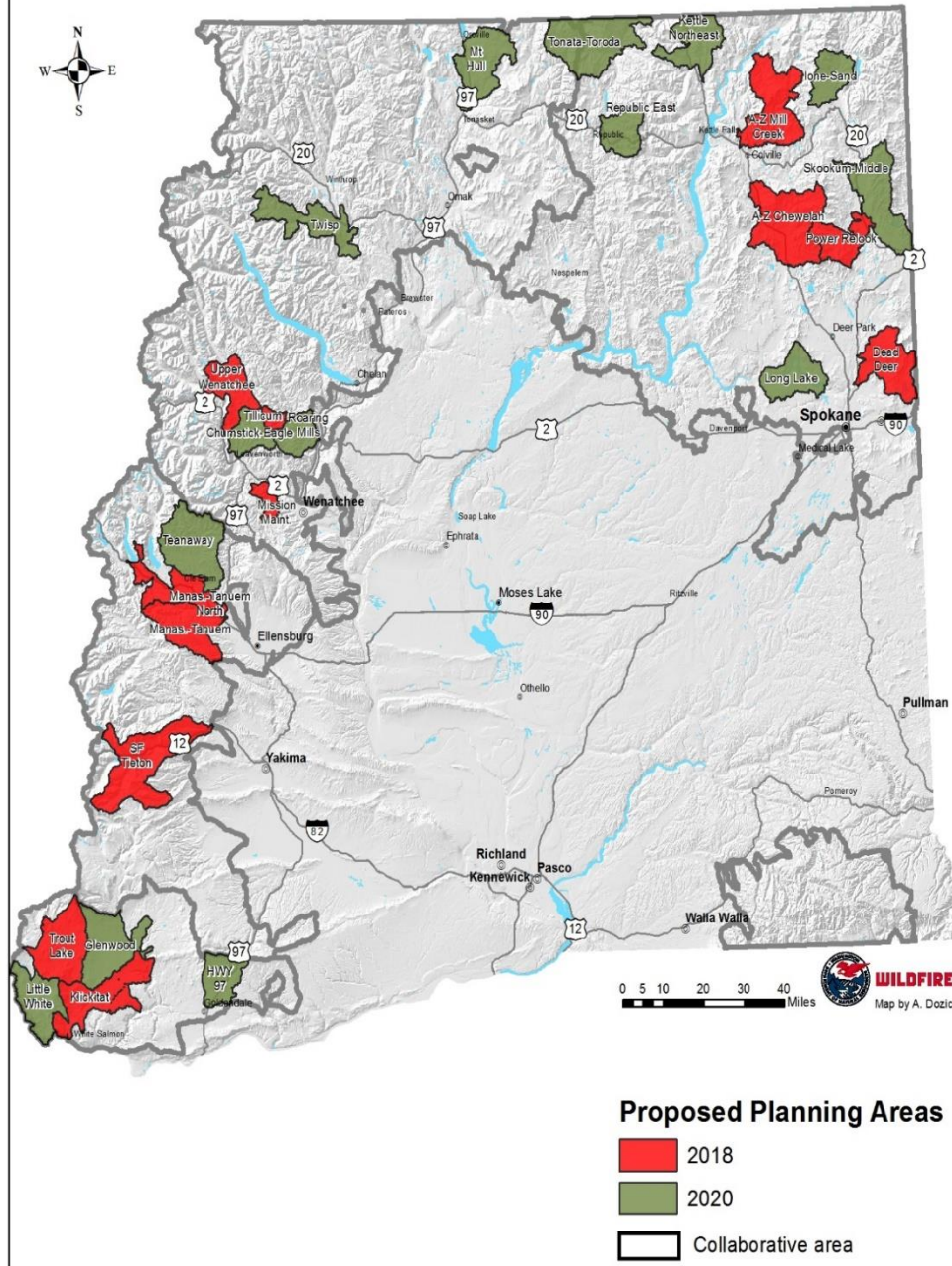
- DNR → Evaluate non-USFS lands to complement analysis, Coordinate treatments planning
Evaluate to ensure achievement risk reduction goals
Request funding for non-federal treatments.

3. NEPA completed. Implementation Phase

- DNR → Evaluate non-USFS lands to complement analysis, Evaluate to ensure achievement risk reduction goals
Request funding for USFS and non-federal treatments.

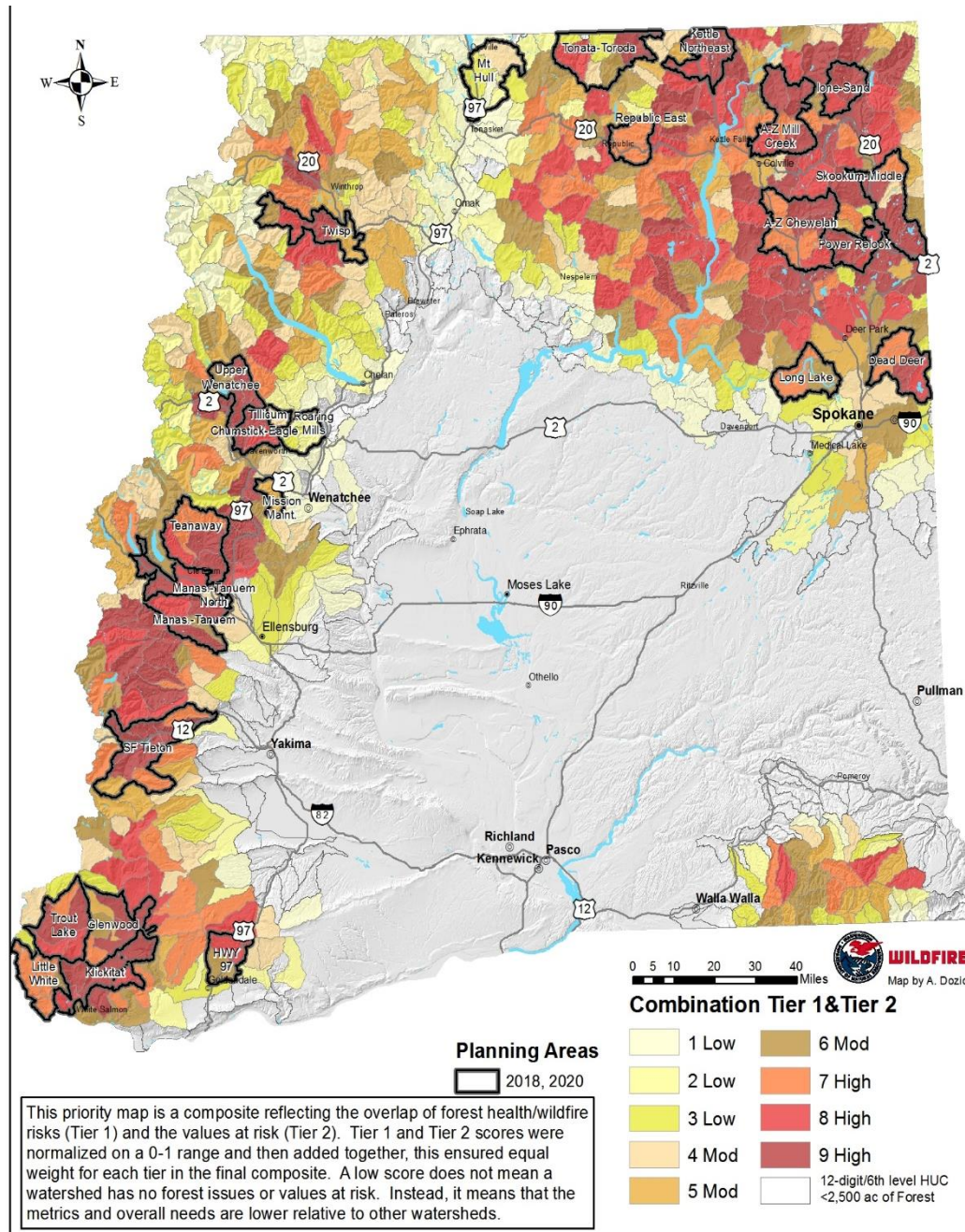
Proposed Planning Areas for 20-Year Forest Health Strategic Plan / SB5546 Eastern WA

Draft



Proposed Planning Areas 2018 and 2020/E. WA Forest Health Priority Watersheds

Draft



HUC 6
Watersheds