

Regional Aquatic Decision Support Tool for Oregon, Washington, and Idaho

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Presentation Objectives

- 1. Provide a general overview of the Tool.**
- 2. Briefly describe its four major components and how it works.**
- 3. Explain the initial set of regional aquatic priorities established and how the Tool operates to develop customized prioritization scenarios.**
- 4. Help you become familiar with the Tool through an on-line demonstration.**
- 5. Inspire you to explore the Tool further on your own.**



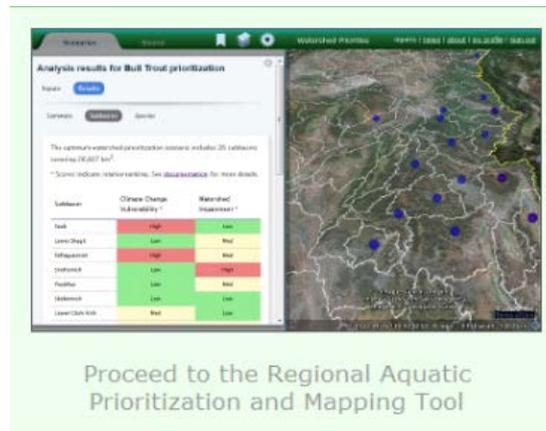
Background & Purpose for Tool Development

- Increased emphasis on strategic planning, particularly in light of changing climate and limited agency resources.
- Region 1 Fishery Resources Program recognized a need to engage in strategic habitat conservation at a landscape scale.
- Led to the need for development of a user-friendly tool assisting conservation planners and managers in identifying regional priorities.



Introduction

- Began in July 2010: Ecotrust and the U.S. Fish and Wildlife Service Region 1 Fishery Resources Program working in collaboration.
- Tool – an on-line, decision support system for aquatic habitat conservation and restoration for a wide range of fish species at the sub-basin (4th field HUC) scale.
- Focus on freshwater systems.



A Collaborative Effort

- **Worked with external partners to build on existing efforts, avoid duplication, acquire data, and vet methods:**

NOAA Fisheries

USDA Forest Service

Climate Impacts Group

Trout Unlimited

U.S. Geological Survey

Others

- **Internal collaboration.**
- **Held several meetings and webinars throughout 2011 to acquire input, user needs, and recommendations on tool development.**

What's Unique about this Tool?

- **Automated, on-line, decision support system that ensures an efficient and repeatable approach.**
- **Fosters collaboration.**
- **Includes 71 fish species, widespread and locally endemic.**
- **Includes important considerations in priority setting:**
 - **Watershed Condition**
 - **Climate Change Vulnerability**
 - **Vulnerability to Aquatic Invasive Species.**
- **Flexible design allows easy updates as new information and data become available.**



Four Key Components of the Tool

- 1. Focal Fish Species**
- 2. Watershed Condition**
- 3. Climate Change Vulnerability**
- 4. Aquatic Invasive Species Vulnerability**



Focal Fish Species



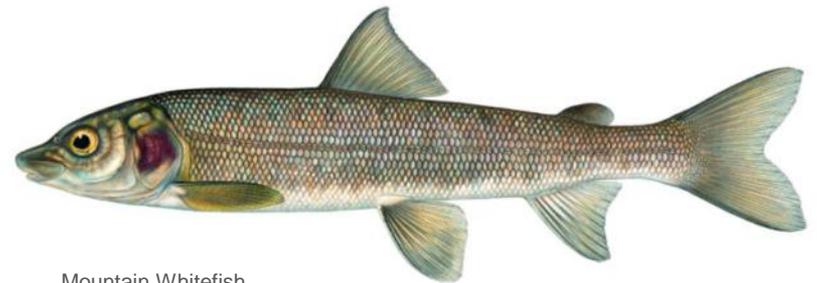
Bull Trout
J. Tomelleri, USFWS, 2010

- **Widespread (49 total)**
 - Pacific Lamprey
 - Salmon Evolutionarily Significant Unites (ESUs) – 32 total
 - Chinook (13), chum (4), coho (6), pink (2), sockeye (7)
 - Steelhead Distinct Population Segments (DPSs) – 11 total
 - Cutthroat Trout
 - Bonneville, Lahontan, westslope, Yellowstone
 - Trout
 - Bull



Focal Fish Species

- **Locally endemic (22 total)**
 - Burbot
 - Chub (5)
 - Dace (2)
 - Eulachon
 - Miller Lake lamprey
 - Olympic mudminnow
 - Sculpin (4)
 - Sucker (4)
 - Whitefish (3)



Mountain Whitefish
J. Tomelleri, Idaho Fish and Game



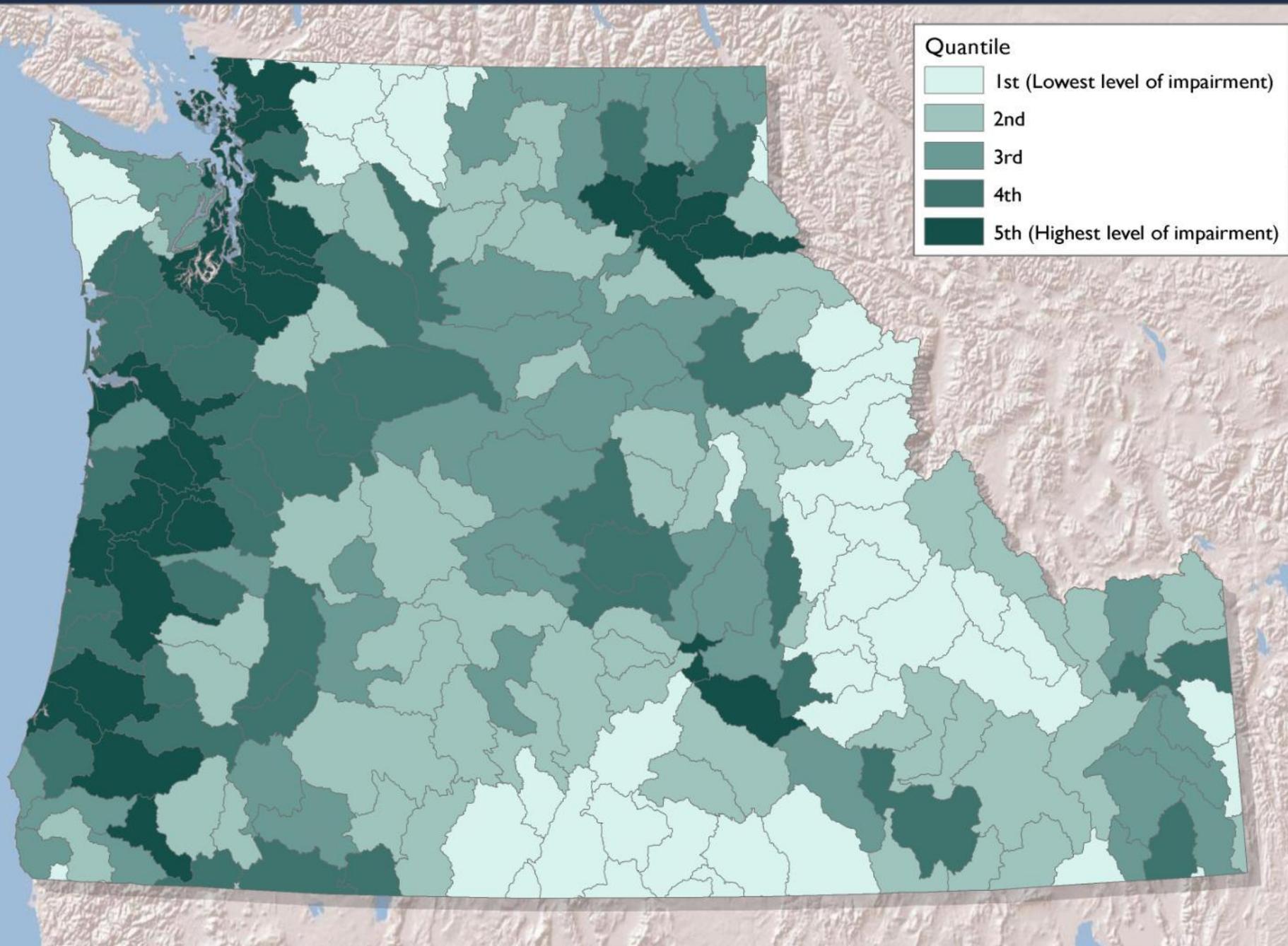
Key Components of the Tool

2. Watershed Condition

- **Based on a number of existing efforts. Reviewed approaches, common inputs, and available data layers.**
 - National Fish Habitat Board 2010; two U.S. Forest Service approaches (Gallo et al. 2005; Potyondy and Geier 2010); and two Pacific Northwest regional approaches (Whittier 2011; NMFS 1996).
- **Developed a framework with quantitative aquatic and terrestrial data inputs to reflect the relative ecological impairment of a watershed. Inputs included:**
 - Water quality, invasive species, human development (roads), population density, and agricultural activity.



Watershed Condition



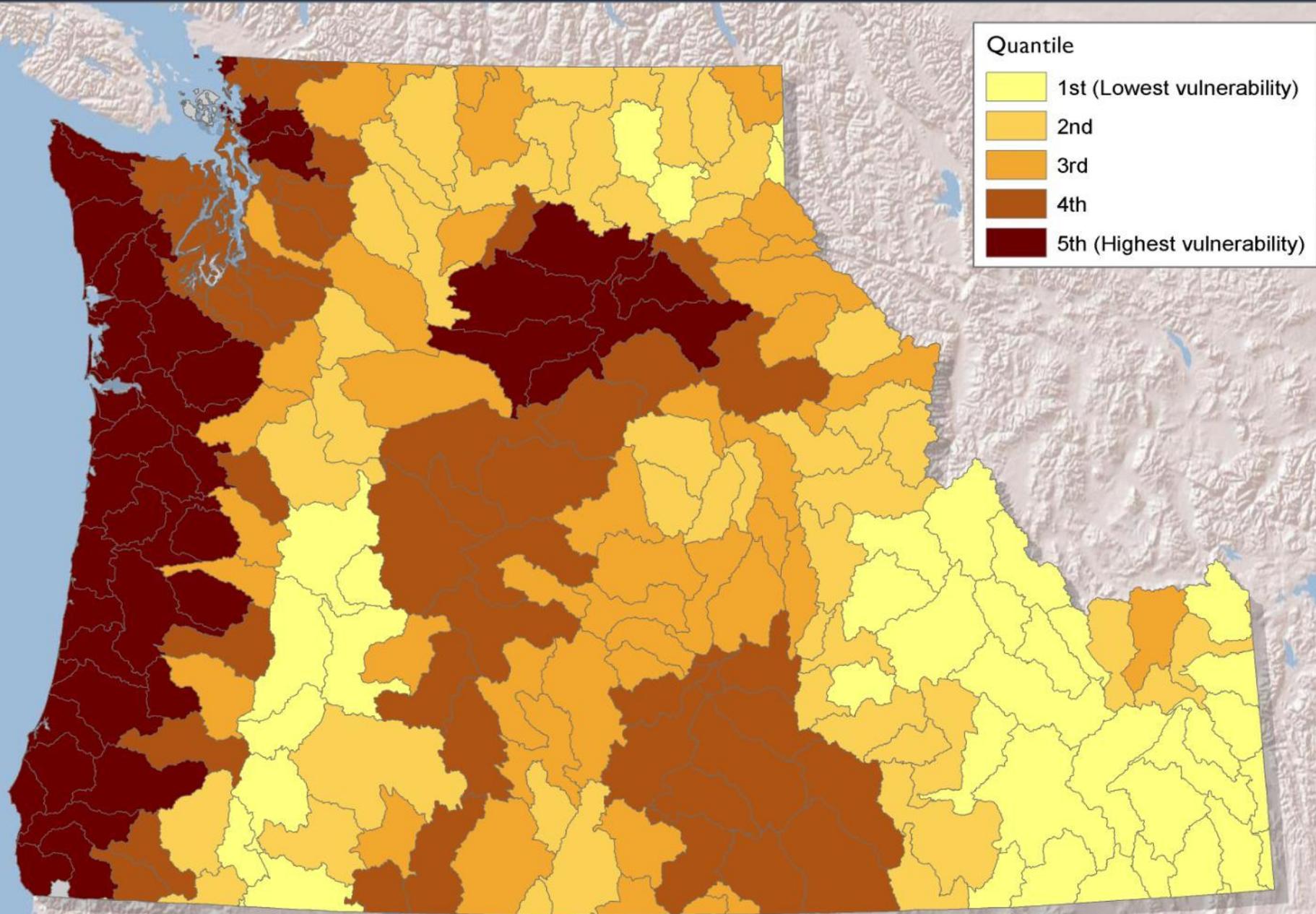
Key Components of the Tool

3. Climate Change Vulnerability

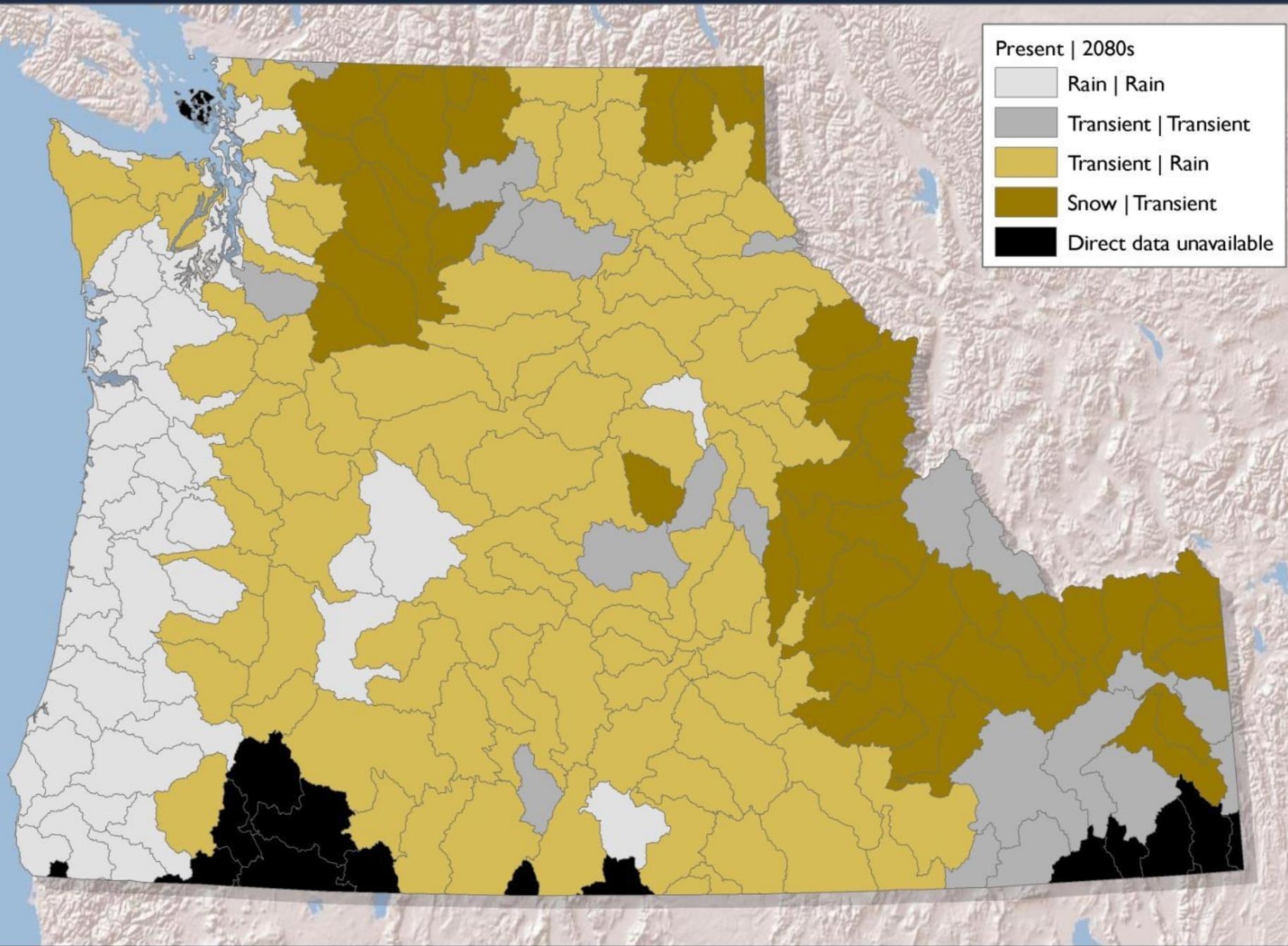
- a) Increase in water temperature
- b) Change in runoff timing
- c) Increase in wildfire occurrence



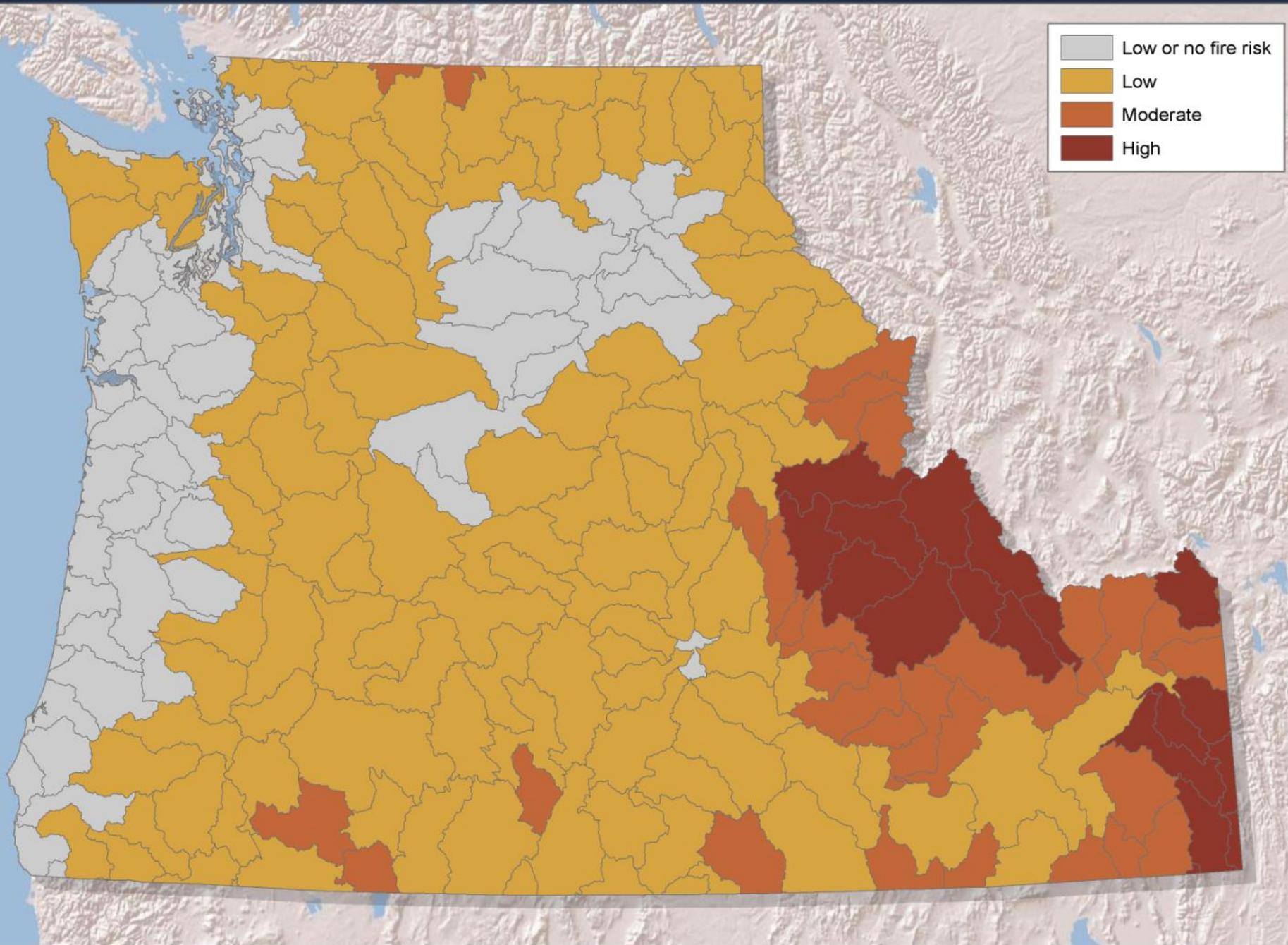
Vulnerability to Water Temperature Increase



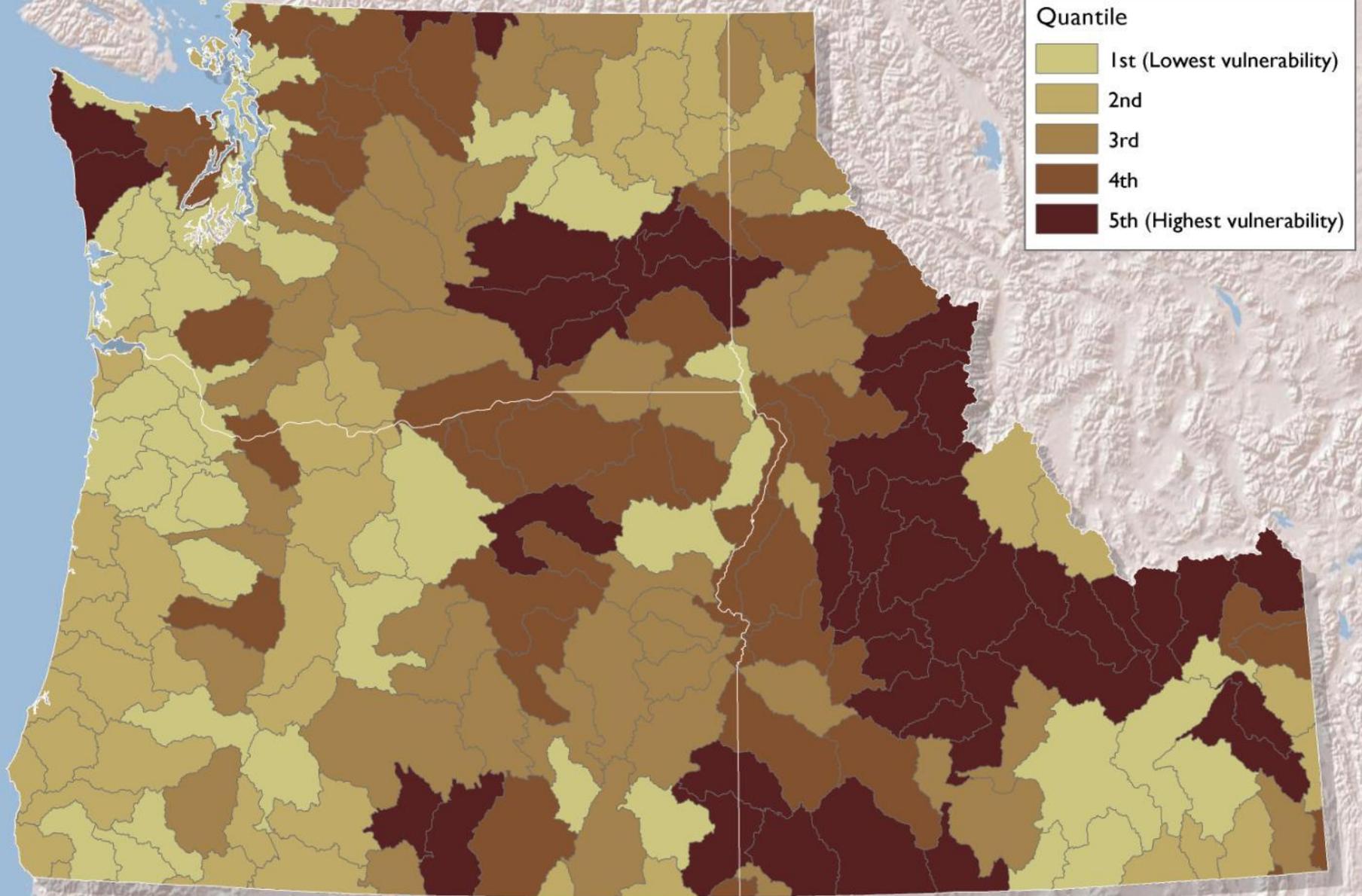
Climate Change: Hydrologic Regime



Climate Change: Wildfire Risk



Climate Change Vulnerability



Key Components of the Tool

4. Aquatic Invasive Species Vulnerability

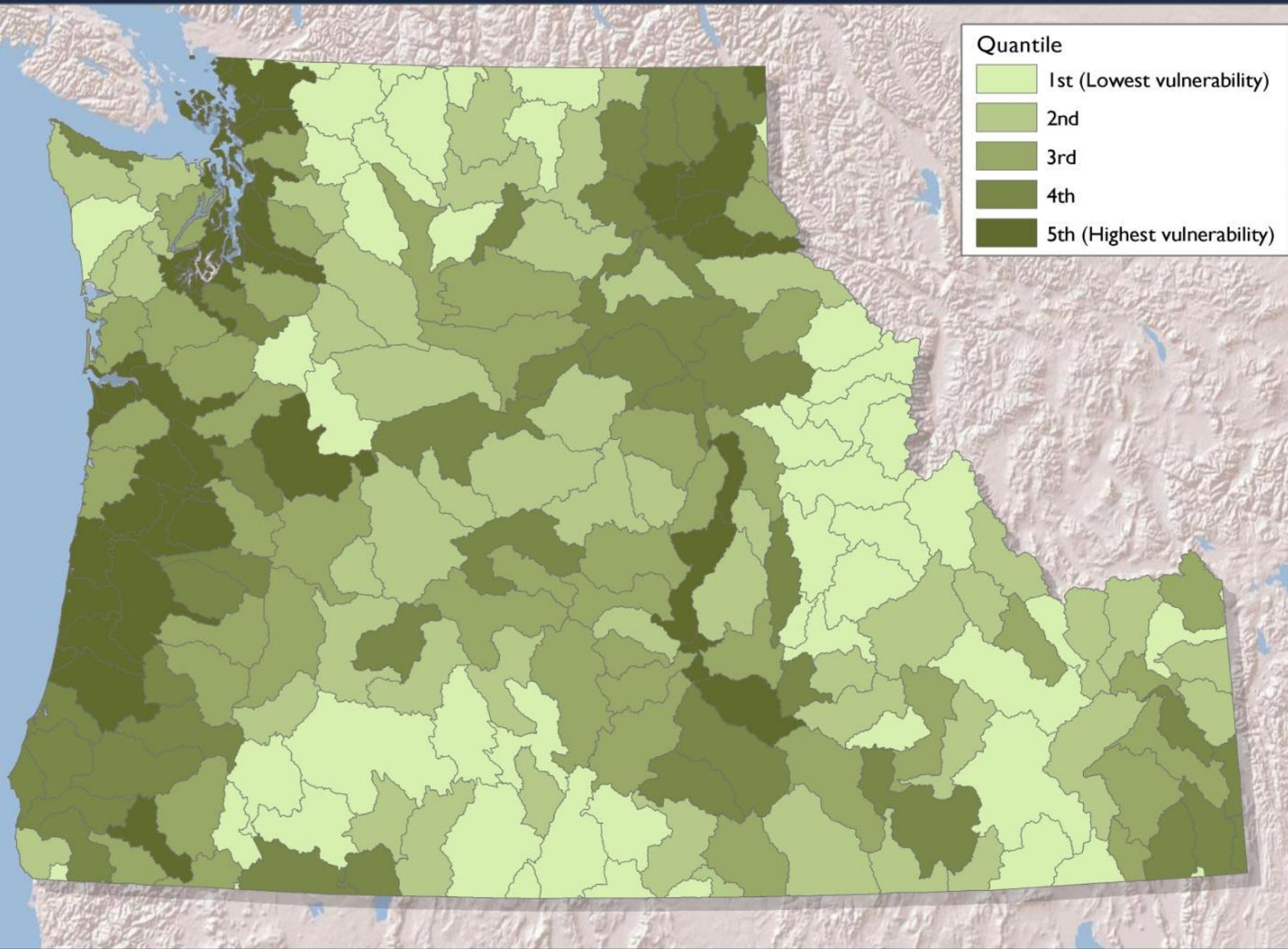
a) Known existing invaders

b) Invasibility index

- the density of current non-native species
- distance to common sources of invasion
- water quality

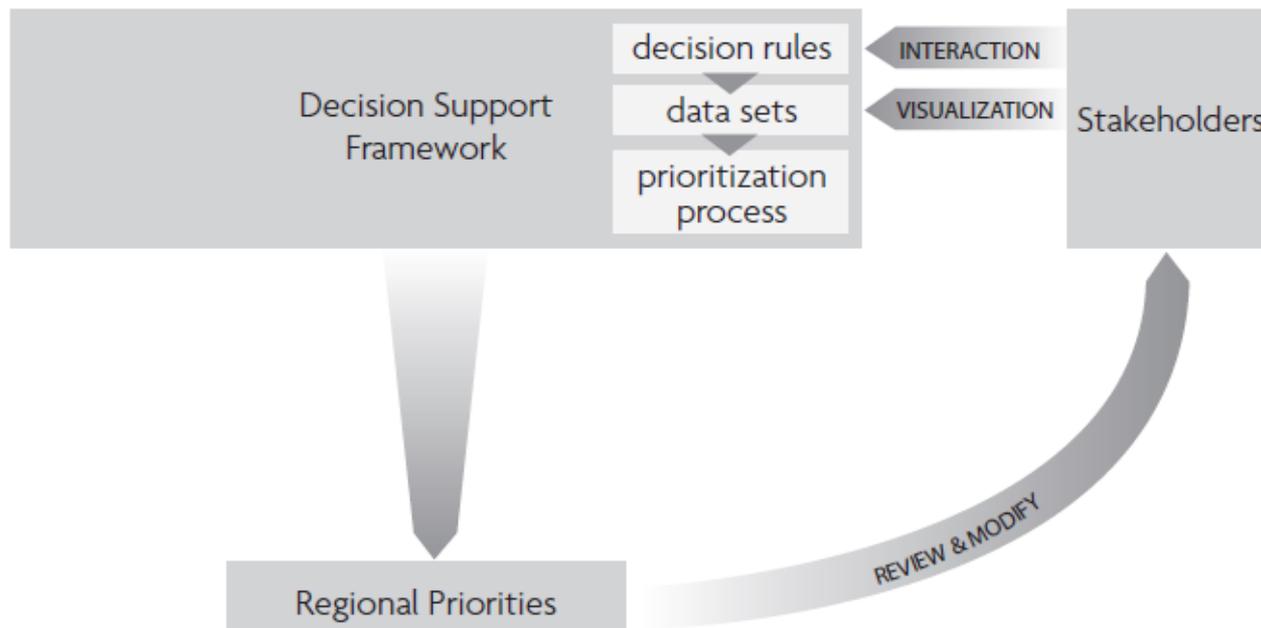


Vulnerability to Invasion



Bringing It All Together

- Tool framework provides mechanism to analyze the different components in meaningful ways.



Prioritization Process

Sub-Basin id	coho	chinook	trout
1	14	10	8
2	0	0	2
3	15	10	14
4	9	8	14
5	10	8	10

Index Based Approach

Sub-Basin id	coho	chinook	trout	sum all
1	14	10	8	32
2	0	0	2	2
3	15	10	14	39
4	9	8	14	31
5	10	8	10	28

Index Based Approach

Sub-Basin id	coho	chinook	trout	sum all
1	14	10	8	32
2	0	0	2	2
3	15	10	14	39
4	9	8	14	31
5	10	8	10	28

60.4%

55.5%

45.8%

Goal = 50% of each species represented

Targets Based Approach

Sub-Basin id	coho	chinook	trout	sum all
1	14	10	8	32
2	0	0	2	2
3	15	10	14	39
4	9	8	14	31
5	10	8	10	28

50%

50%

58.3%

Goal = 50% of each species represented

Targets Based Approach

Sub-Basin id	coho	chinook	trout	Climate Change	sum all
1	14	10	8	24	32
2	0	0	2	16	2
3	15	10	14	69	39
4	9	8	14	48	31
5	10	8	10	22	28

52.3%

50%

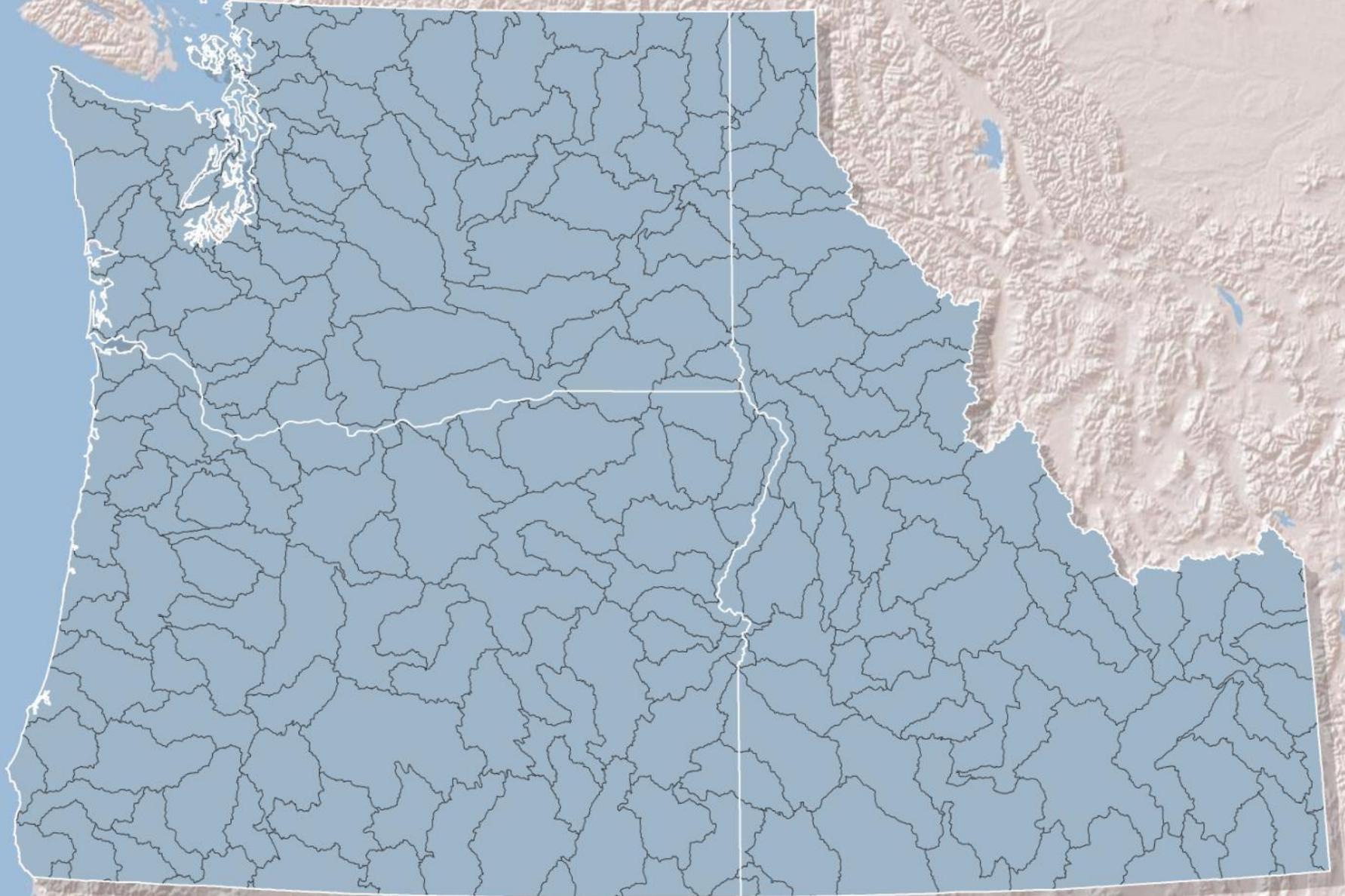
50%

Goal = 50% of each species represented

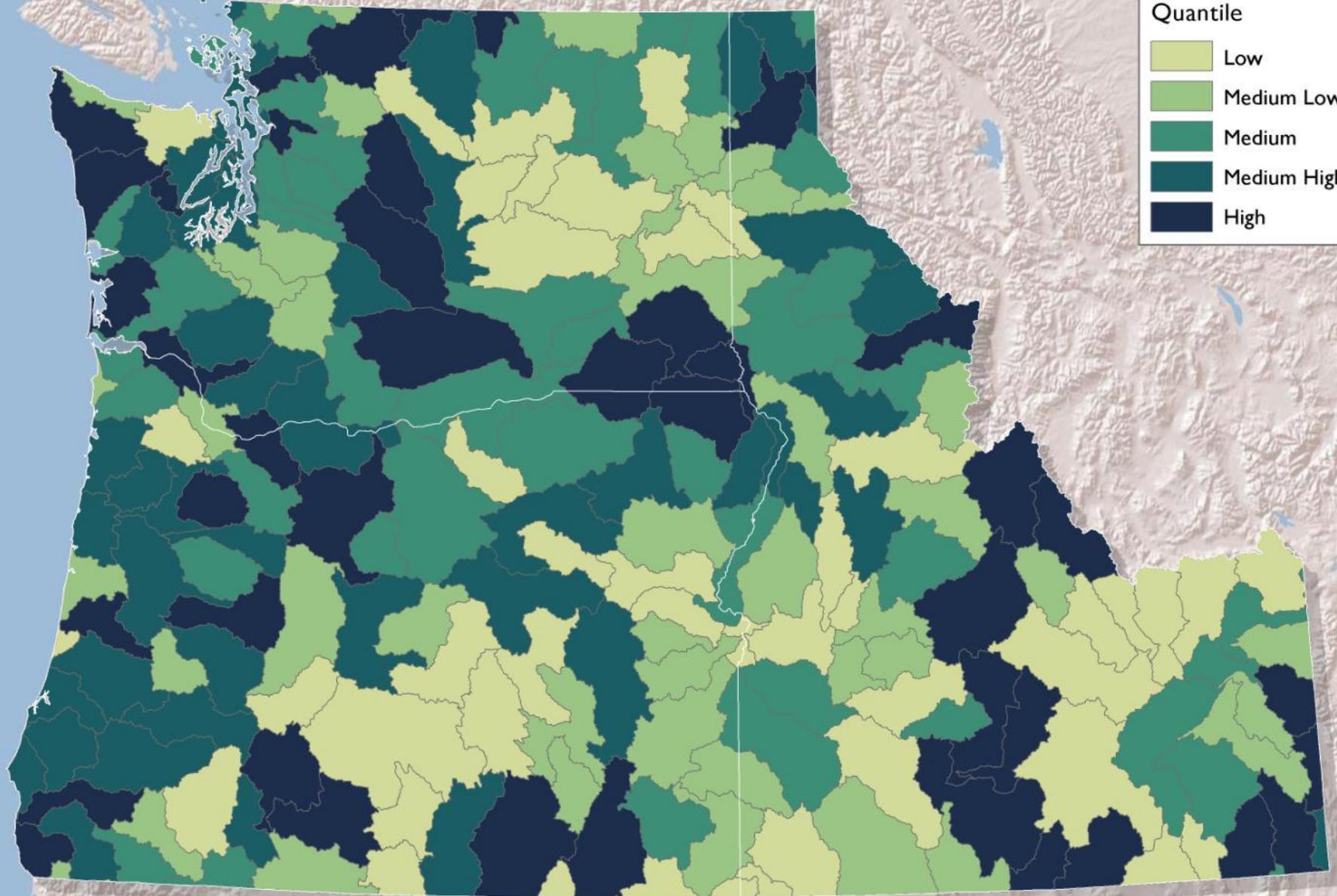
The Tool

- **Spatially enabled web mapping platform that's built using an open source stack**
- **Allows for user interaction with the data and the prioritization process**
 - **Data visualization and exploration**
 - **Setting objectives for priorities**
- **Can develop a wide range of scenarios rapidly and aggregate results from multiple scenarios to array watersheds in terms of importance.**

Sub-basin Boundaries



Regional Aquatic Priorities



Online Introduction

- You can view and explore the priorities identified by Ecotrust and the Service, while also viewing the data layers and information supporting the analysis.
- You can develop customized priority scenarios by becoming a registered user.

Go to:

<http://aquatic-priorities.apps.ecotrust.org/>



What the Tool Currently Does and Doesn't Do

What it Does

- Identifies relative sub-basin priorities at the regional scale.
- Facilitates comparison of prioritization scenarios based on real-time input and adjustment of parameters.
- Enables exploration of data at finer scales so users can begin to define management objectives for specific watersheds.

What it Doesn't Do

- Identify limiting factors or specific restoration actions.
- Identify vulnerabilities for individual fish species.
- Address restoration potential or species recovery “gaps.”



Thank you! Questions ?



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