

# **Riparian Data Engine: An Aid for Identifying and Prioritizing Riparian Restoration Projects**

Keith Folkerts and Robin Hale  
Habitat Program



# Overview

15-minute presentation:

- Context
- Who is involved?
- Why are we building this tool?
- What is this tool?
- Who are we building it for? How do we anticipate they will use it?
- How has it been received thus far?
- When will it be ready?

15-minute dialog/Q&A



# Who is Involved?

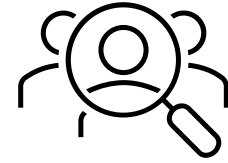


Legislature



WDFW Staff

Ken Pierce, Robin Hale  
Margen Carlson,  
Chris Conklin ...



Focus Group of  
Practitioners

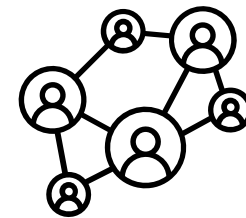


Groups  
Convened by the  
Legislature



Consultant  
Team: ESA

Mike Leech, Spencer  
Easton...



Key Users



# Context

A photograph of a stream flowing through a grassy field. The stream is in the foreground, with water flowing over rocks and fallen logs. The background shows a green field with a fence and a bench. The sky is overcast.

We anticipate increasing interest and investment in riparian restoration.

Our tool delivers greater bang for the buck.

# Why are we Building this Tool?

- Purpose (proviso language):

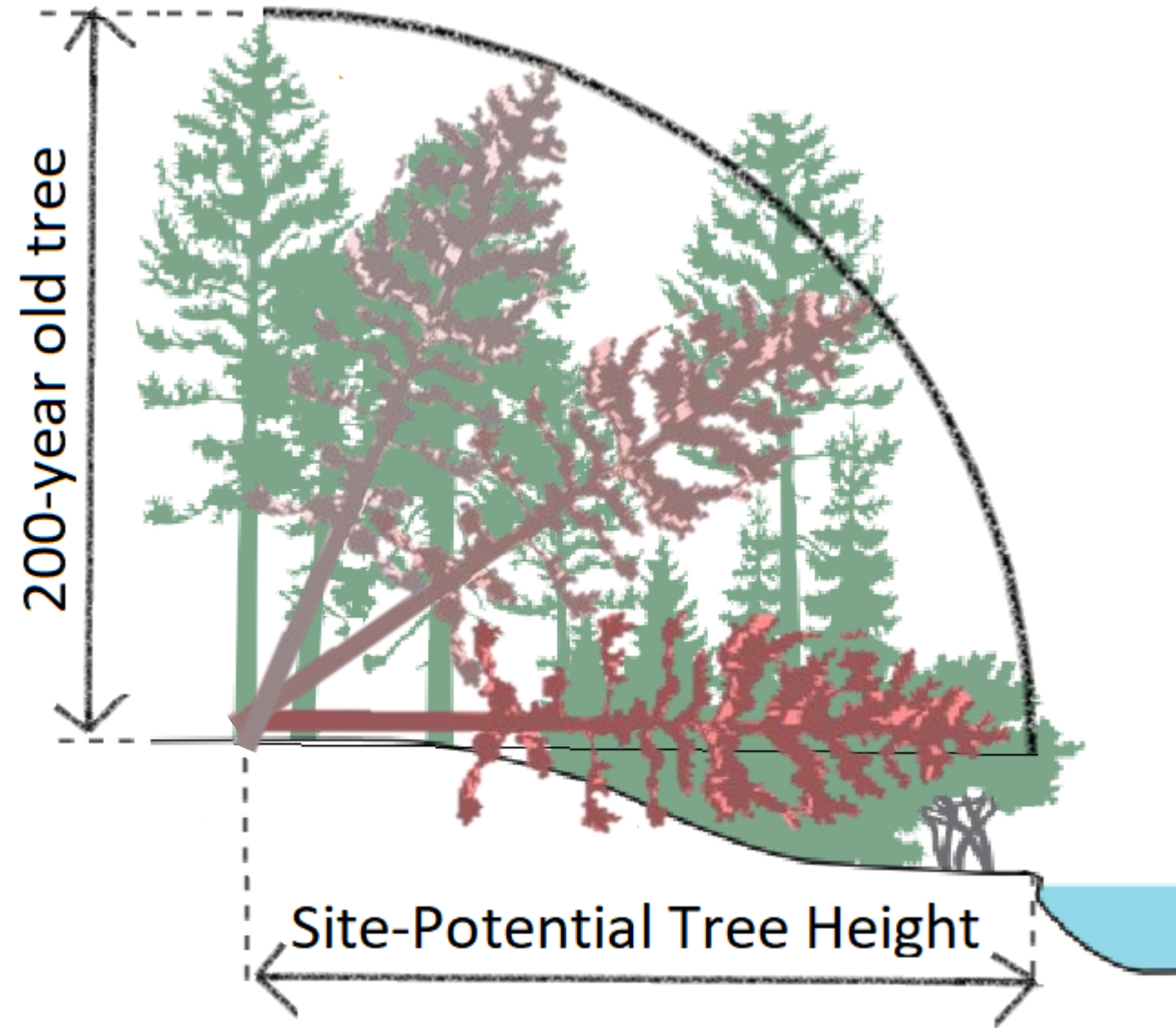
*...assess the status of current riparian ecosystems...identifying any **gaps in vegetated cover** relative to a science-based standard for a fully functioning riparian ecosystem and comparing ...[gaps] to water **temperature impairments**, known **fish passage barriers**, and status of **salmonid stocks**.*



# Proviso language

*“...relative to a science-based standard for a fully functioning riparian ecosystem...”*

Site-potential tree height of a 200-year-old tree (SPTH<sub>200</sub>) is the width from which full riparian functions are provided.

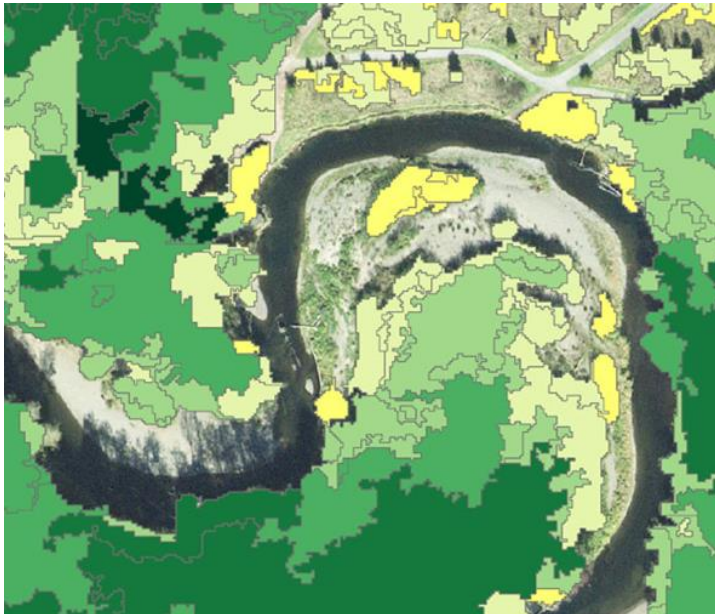


# What the Two Provisos Fund

The Legislature passed two provisos for ~\$1M/year for 3 years for WDFW to:

- Create new data (example: High Resolution Change Detection)
- Create a system to store, retrieve, and aggregate data (“Riparian Data Engine”)

Land cover data



 Riparian Data Engine



# What is this Tool?

This is an online decision support tool to help users identify and prioritize riparian areas for restoration projects.

*Interactive maps*

*Customizable filters*

*Data details and summaries*

**Riparian Data Engine** About Map Explorer Hi, Robin Hale Washington Department of FISH & WILDLIFE

Map Explorer: Nooksack Watershed (WRIA 1)

**Filters**

- Location**  
WATERSHED: Nooksack Watershed (WRIA 1)
- Search Criteria**  
TEMPERATURE IMPAIRED WATERBODIES  
 Ecology 305(b) List  
 Ecology 303(d) List  
 Not Impaired  
FISH PASSAGE BARRIERS  
 Unknown Passability  
 Not Passable  
 Passable  
 No Known Barrier  
SWIFD SALMON DISTRIBUTION  
 Salmon Bearing  
 Non-Salmon Bearing  
NON-VEGETATED %  
0 100  
TREE COVER %  
0 100  
Apply Clear

**Reaches Shown** Riparian Acres: 201,711 (29.49%) Stream Miles: 5,711 (22.5%)

Search table... Clear Filters

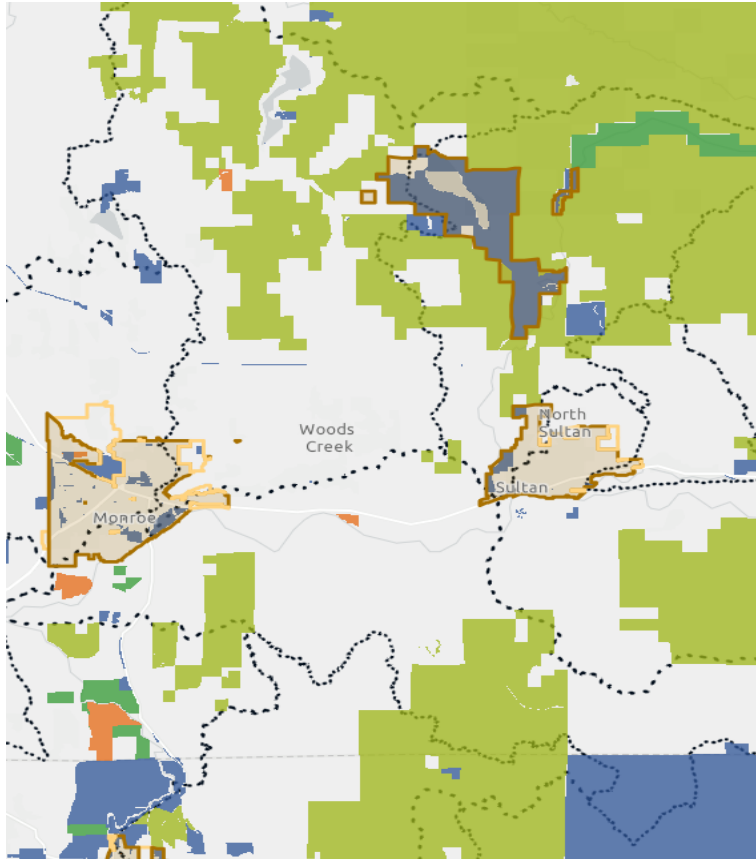
PID	Stream	Ac...	Zo...	Tree Cover %	Non-Vegetated %	Temperature Impairments	SWIFD Salmon Distribution
{0268d8da-9c10-46eb-8b2d-c05...	Double D...	22.35	Flood...	2.85	3.38	5	Chum Salmon, Coho Salmon, PL...
{05DD8442-8623-4262-882E-27...	Canyon C...	3.52	Flood...	92.18	6.20	Not Impaired	Chinook Salmon, Coho Salmon, ...
{0c5c21b3-b675-49c4-ad42-787...		9.89	Flood...	0.00	11.55	5	Chum Salmon, Steelhead Trout
{0C862358-DC43-41F9-9896-5F...	Canyon C...	0.54	RMZ	100.00	0.00	Not Impaired	Steelhead Trout
{0D565E77-66E5-44F1-ACDA-D...	Dead Hor...	0.57	RMZ	81.80	18.20	Not Impaired	Chinook Salmon, Chum Salmon, ...
{0e030420-b338-417e-a9b0-b6c...		0.26	RMZ	98.11	2.27	2	Chinook Salmon, Chum Salmon, ...





# Data we are Compiling for the Tool

**Boundaries:** Public lands, cities, parcels, land use, watersheds...



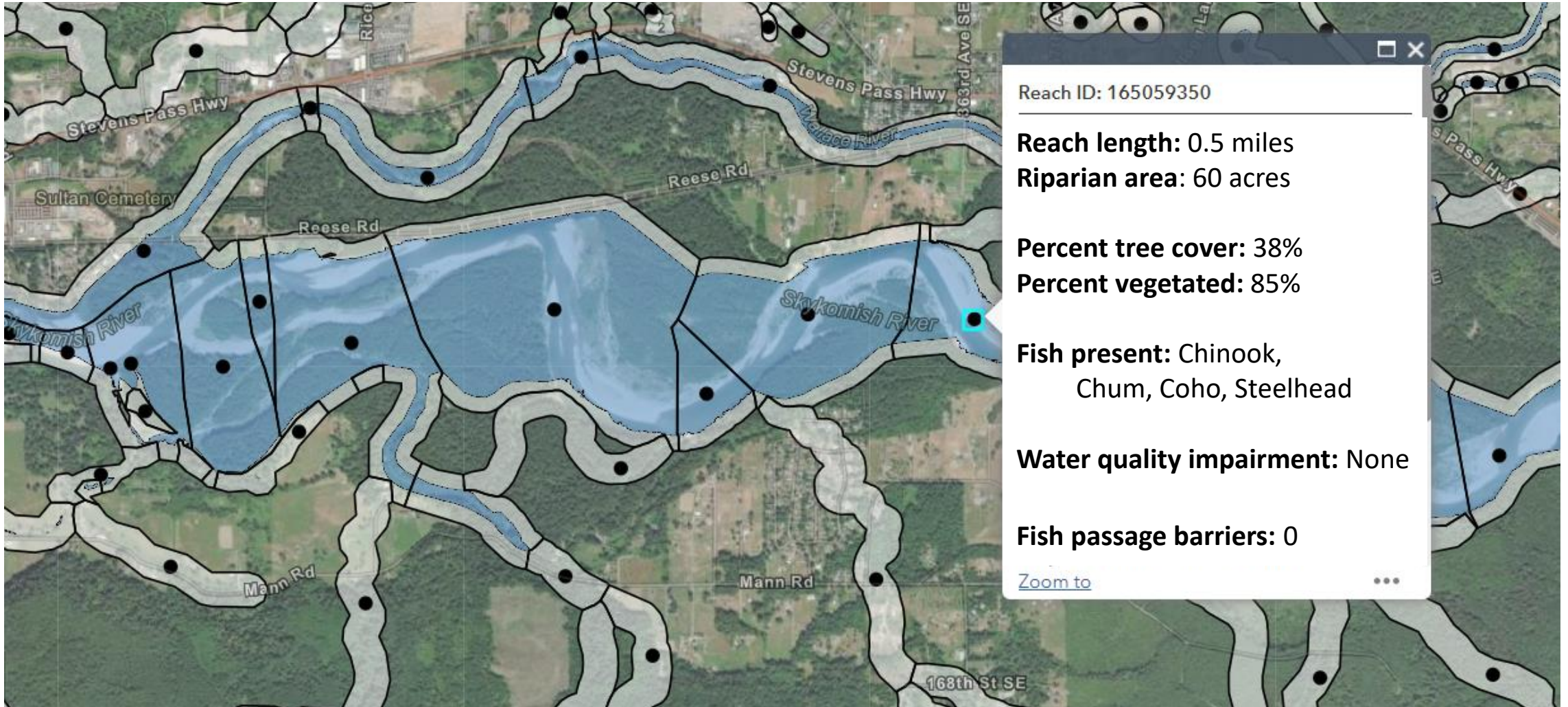
**Fish & streams:** Stock presence, passage barriers, water quality...



**Land cover:** Type (tree, shrub), vegetation height, change over time.

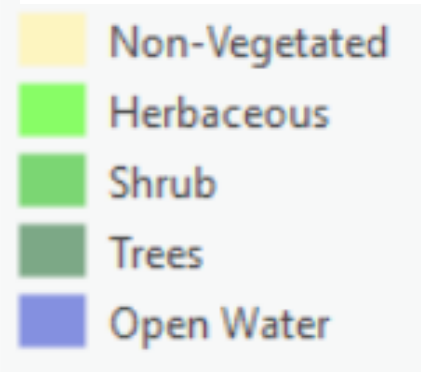


# Riparian Management Zones (RMZs)

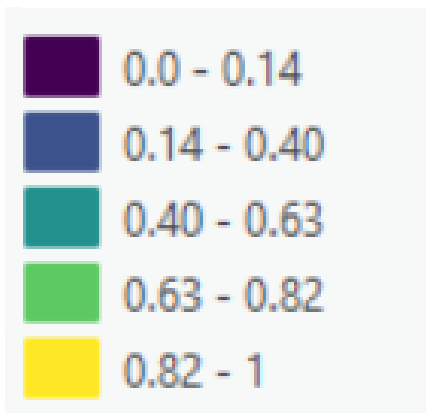


# Land cover data & Canopy metric

## Land cover



## Canopy metric

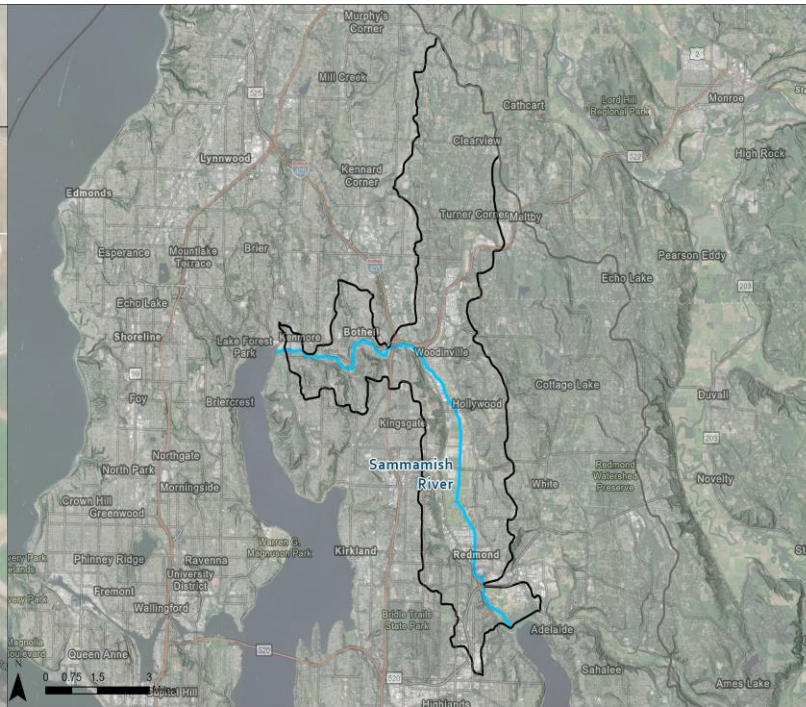


# Showing Results at Multiple Scales

Reach



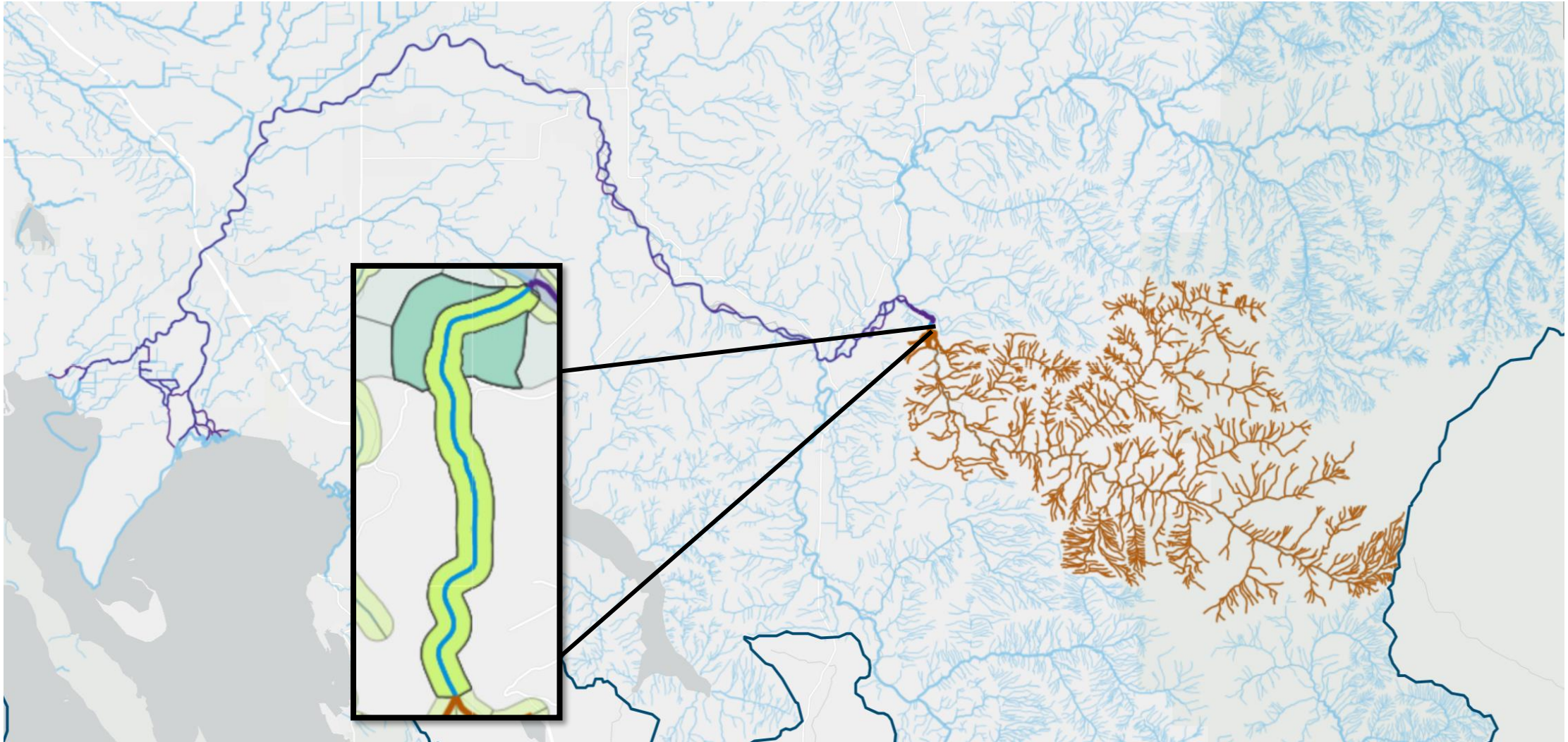
Sub-watershed or River



WRIA



# Upstream/downstream connections



# Who are We Building This Tool for?

Local riparian restoration practitioners

- Salmon recovery lead entities
- Conservation District staff

Regional entities involved with riparian restoration

- Salmon Recovery Funding Board
- State Conservation Commission

Policy level: Legislature, Riparian Roundtable



# How do We Anticipate This Tool will be Used?

Local riparian restoration practitioners

- Identify landowners to target with incentives
- Identify importance of opportunistic projects

Regional entities involved with riparian restoration

- Develop criteria to effectively distribute funds

Policy level: Legislature, Riparian Roundtable

- Right-size incentives to match the challenges.



# How has it been Received Thus Far?

More-than-anticipated participation in workshops

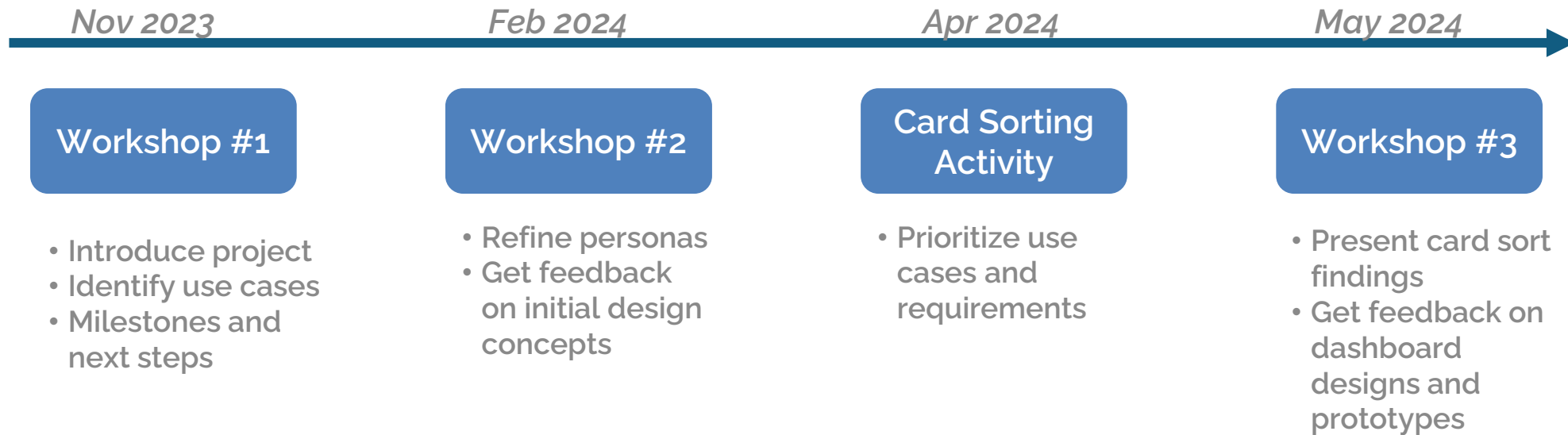
- Conservation District staff
- Salmon Recovery Lead Entities
- Separate workshop for tribal leaders and their staff

We selected members of a focus group to help us build a tool that is relevant to their needs.





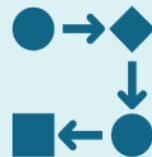
# Building a Useful Tool: Listening to our Stakeholders



## Deliverables:



Personas



Use Cases



Requirements



Prototypes



# Next Steps

- Continued improvements
  - Additional land cover and change data.
  - Expanded analysis capabilities.
- Continue to seek feedback
  - Continue dialog with tribes and stakeholders.
  - Design it to inform key users' most critical questions.
  - Improve user interface.
- Deploy it to key stakeholders.
- Seek ongoing funding.



The screenshot shows the homepage of the Riparian Data Engine. At the top, there is a navigation bar with the logo 'Riparian Data Engine', links for 'About' and 'Map Explorer', a user profile 'Hi, Mike Leech', and the 'Washington Department of FISH & WILDLIFE' logo. The main content area features a large banner image of a river flowing through a forest. Overlaid on the banner is the text 'RIPARIAN DATA ENGINE' and 'Data and tools for Riparian planning'. Below the banner, there is a 'Tools' section with a blue 'x' icon. To the right of the banner is an 'ABOUT' box containing text: 'The Riparian Analysis Platform unites WDFW riparian datasets in Washington State. The platform tools allow planners to evaluate the conditions of riparian ecosystems, and make data-informed planning decisions.' Below this is a 'Map Explorer' section with a map background and the text 'Browse watersheds to discover patterns in riparian reach data.' and an 'Explore' button. Further down is a 'Data' section with the text 'The Platform brings together a wide collection of datasets that allow users to find and evaluate riparian conditions.' Below this are four data category boxes: 'Boundary Data' (listing Counties, WRIs, Watersheds, Cities/Urban Growth Areas, and Parcels), 'Fish Data' (listing SWIFD and ESA critical habitat), 'WDFW Data' (listing RMZs, Land Cover, Change Detection, Canopy Pattern Metric, and Fish Passage Barriers), and 'Other Data' (listing Protected Areas Database, Temperature impaired reaches, and Streams & waterbodies).

# When will it be Ready?

We anticipate this will be available to practitioners a year from now.

Our proviso and contract with ESA runs through June 2025.

The screenshot displays the 'Riparian Data Engine' web application. The interface includes a navigation bar with 'About' and 'Map Explorer' links, and a user profile for 'Hi, Robin Hale'. The main content area is titled 'Map Explorer: Nooksack Watershed (WRIA 1)'. On the left, a 'Filters' panel is active, showing the following settings:

- Location:** Nooksack Watershed (WRIA 1)
- Search Criteria:**
  - TEMPERATURE IMPAIRED WATERBODIES:** Ecology 305(b) List, Ecology 303(d) List, Not Impaired (all checked)
  - FISH PASSAGE BARRIERS:** Unknown Passability, Not Passable, Passable, No Known Barrier (all checked)
  - SWIFD SALMON DISTRIBUTION:** Salmon Bearing (checked), Non-Salmon Bearing (unchecked)
  - NON-VEGETATED %:** 0 to 100 (slider)
  - TREE COVER %:** 0 to 100 (slider)

Below the filters, the 'Reaches Shown' section displays summary statistics: Riparian Acres: 201,711 (29.49%) and Stream Miles: 5,711 (22.5%). A table below this section lists individual reaches with columns for PID, Stream, Ac., Zo., Tree Cover %, Non-Vegetated %, Temperature Impairments, and SWIFD Salmon Distribution.

PID	Stream	Ac.	Zo.	Tree Cover %	Non-Vegetated %	Temperature Impairments	SWIFD Salmon Distribution
{0268d8da-9cf0-46eb-8b2d-c05...	Double D...	22.35	Flood...	2.85	3.38	5	Chum Salmon, Coho Salmon, Pl...
{05DD8442-8623-4262-882E-27...	Canyon C...	3.52	Flood...	92.18	6.20	Not Impaired	Chinook Salmon, Coho Salmon, ...
{0c5c21b3-b675-49c4-ad42-787...		9.89	Flood...	0.00	11.55	5	Chum Salmon, Steelhead Trout
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{0D565E77-66E5-44F1-ACDA-D...	Dead Hor...	0.57	RMZ	81.80	18.20	Not Impaired	Chinook Salmon, Chum Salmon, ...
{0e030420-b338-417e-a9b0-b6c...		0.26	RMZ	98.11	2.27	2	Chinook Salmon, Chum Salmon, ...



# Questions and Dialog

The screenshot displays the 'Riparian Data Engine' web application. The top navigation bar includes the logo, 'About', and 'Map Explorer' links, along with a user profile for 'Hi, Keith Folkerts' and the 'Washington Department of FISH & WILDLIFE' logo.

The main interface is divided into a left sidebar for filters and a right section for map exploration and data tables.

**Filters:**

- 1 Location:** A dropdown menu is set to 'Nooksack Watershed (WRIA 1)'.
- 2 Search Criteria:**
  - TEMPERATURE IMPAIRED WATERBODIES:** Three checkboxes are checked: 'Ecology 305(b) List', 'Ecology 303(d) List', and 'Not Impaired'.
  - FISH PASSAGE BARRIERS:** Four checkboxes are checked: 'Unknown Passability', 'Not Passable', 'Passable', and 'No Known Barrier'.
  - SWIFD SALMON DISTRIBUTION:** 'Salmon Bearing' is checked, and 'Non-Salmon Bearing' is unchecked.
  - NON-VEGETATED %:** A slider is positioned at 100%.
  - TREE COVER %:** A slider is positioned at 100%.

**Map Explorer: Nooksack Watershed (WRIA 1)**

The map shows a network of blue stream channels within a watershed boundary. Map controls for zooming and full-screen are visible on the left side of the map area.

**Data Tables:**

Riparian Acres	
Total	201,711
Visible	59,377
% Visible	29.44%

Stream Miles	
Total	6,167
Visible	1,565
% Visible	25.37%

At the bottom of the filter sidebar, there are 'Apply' and 'Clear' buttons.

