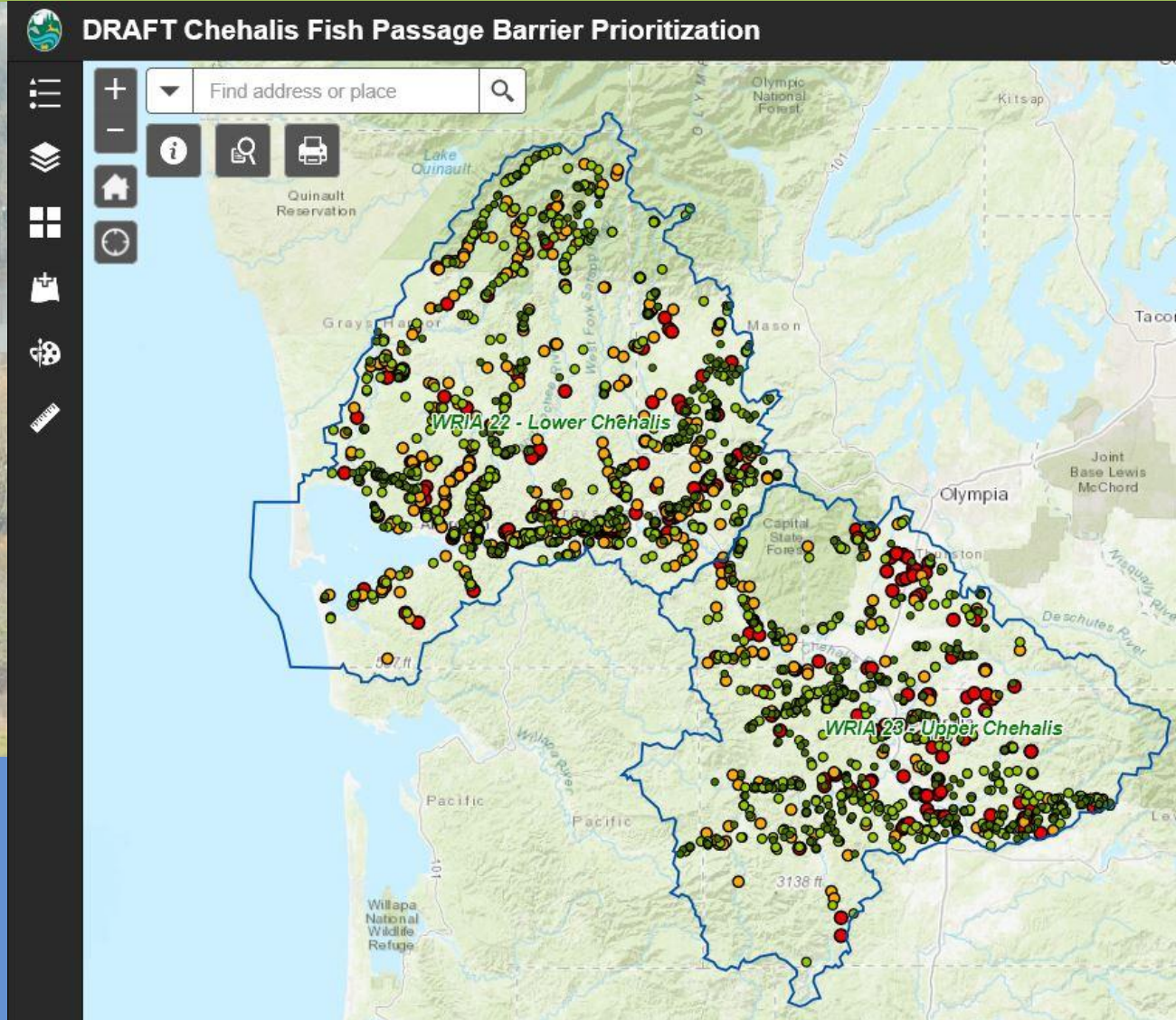# Chehalis Fish Passage Barrier Prioritization

Chris Dwight

Fish Passage Experience

- **WDFW**
  - Since the mid- 1980s WDFW has collected fish passage data.
  - 1991 Database was created and now has +50,000 sites.

- **Chris Dwight**
  - WDFW Fish Passage +7 years
  - Barrier Inventory & Habitat Surveys
  - Inventory Crew Supervisor
  - NRCS Project Manager / Scoping Biologist

Chehalis Barrier Prioritization

Project Objectives

- **Interactive Tool:** GIS online map and Excel based prioritization tool to guide grant funders and restoration practitioners to focus on the top ranking barriers that are in the top 10% to 33% of barriers.
  - User-friendly interactive map that includes 11 model metrics to guide the selection of projects.
  - Large dataset of ~4,500 sites and ~2,500 barriers
  - Update 2008 Culvert Prioritization

Chehalis Barrier Prioritization

Project Objectives

- **Collaborative Partnerships**: Interdisciplinary work group who developed the tool that is made up of restoration practitioners, local jurisdictions, state and federal agencies, and grant funders that include:

  - WDFW, USFWS, Lead Entity, Coast Salmon Partnership, Chehalis Tribe, Quinault Indian Nation, RFEG, Lewis CD, Pacific CD, Grays Harbor CD, Thurston CD, Lewis County, Thurston County, Trout Unlimited, and Aspect Consulting.

  - Build a Shared Vision: dedicated staff time, facilitator, meeting minutes, deadlines & funding

Chehalis Barrier Prioritization

Project Objectives

- **Science and Modeling**: Utilized best available science and coordination with other ASRP funded models and research. Used the same inputs to either focus on one species or multiple species of salmon to guide restoration.

- **Data Sharing**
    - WDFW Fish Passage Data
    - SWIFD Fish Distribution
    - WDFW Thermalscape
   - NOAA Life Cycle Inputs

Updated Culvert Inventory

- **Robust Fish Passage Data:** Chehalis Basin WRIA 22 & 23 has the most complete and updated fish passage inventory in Washington.
  - 2+ years of dedicated WDFW field staff
  - Extensive barrier QA/QC
  - Duplicate sites FPDSI & RMAP

NHD and SWIFD Update

- **Updated Salmon Distribution**: Updated NHD & SWIFD fish distribution to add over 100 miles of salmon distribution within the basin.
  - Ecology completed ~ 300 NHD updates
  - SWIFD is essential to auto calculate habitat gain to end of fish use
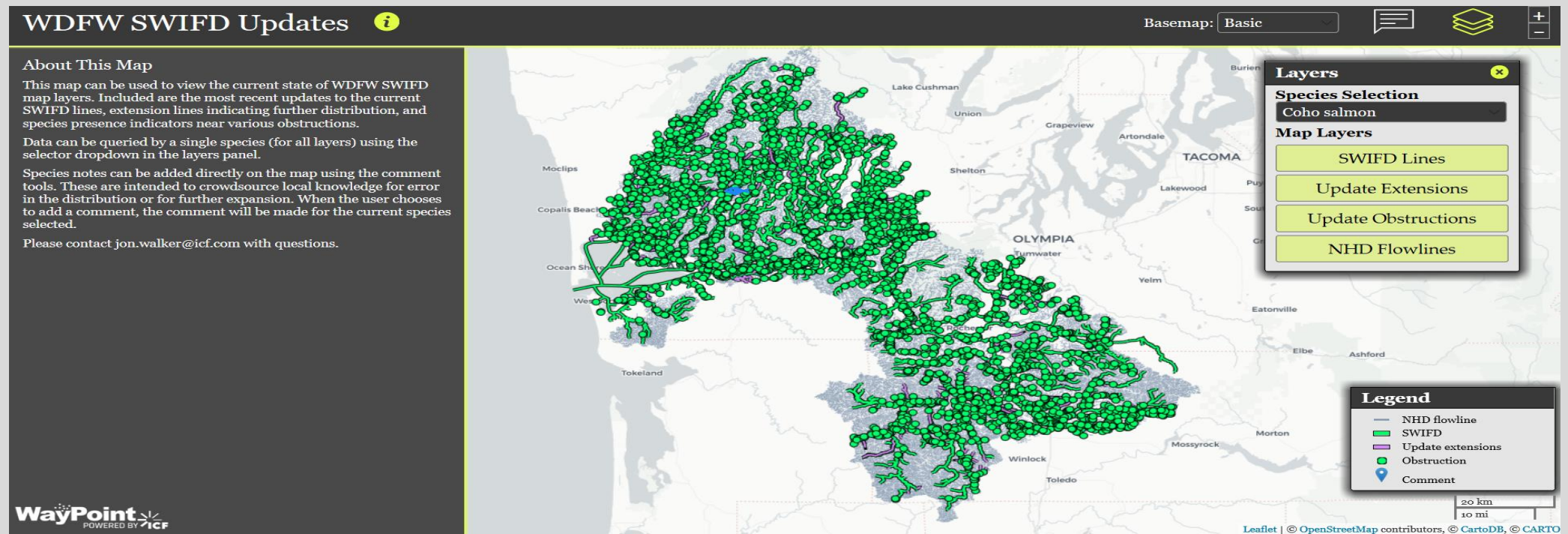
Model Metrics

Metric	Dataset	Proposed Scoring	Scoring Category
Barrier Passability	WDFW/RMAP barrier datasets	5 = 0% Passable	Barrier-specific
		3= 33% Passable	
		1= 67% Passable	
Habitat Quantity	SWIFD (currently draft dataset)	10= +7 miles	Species-specific
		9= 6-7 miles	
		8= 5-6 miles	
		7= 4-5 miles	
		6= 3-4 miles	
		5= 2-3 miles	
		4= 1.5-2 miles	
		3= 1-1.5 miles	
		2= .5-1 miles	
		1= .1-.5 miles	
		0= No habitat upstream	
Intrinsic Habitat Quality	IP	5= >0.8	Species-specific
		4= 0.6-0.8	
		3= 0.4-0.6	
		2= 0.2-0.4	
		1= <0.2	
Number of Species Benefitting	SWIFD (currently draft dataset)	5=5	Barrier-specific
		4=4	
		3=3	
		2=2	
		1=1	
		0=0	

Model Metrics

Metric	Dataset	Proposed Scoring	Scoring Category
Downstream Barriers	WDFW/RMAP barrier datasets, NHD	5= No barriers downstream (100% connectivity)	Barrier-specific
		4= Only 67% passable barrier(s) downstream	
		3= One 33% Passable barrier downstream	
		1= multiple 33% passable barriers downstream	
		0=0% Passable barrier downstream	
Upstream Barriers	WDFW/RMAP barrier datasets, NHD	5= No barriers upstream (100% connectivity)	Barrier-specific
		3= One partial barrier upstream	
		2=multiple partial barriers upstream	
		1=0% Passable barrier(s) upstream	

Model Metrics

Metric	Dataset	Proposed Scoring	Scoring Category
Road Density	NOAA (NHD-based dataset)	5 = <0.5 mi/sq mi 4= 0.5-2 mi/sq mi 3= 2-5 mi/sq mi 2= 5-10 mi/sq mi 1= >10 mi/sq mi	Barrier-specific
Water Quality	Ecology 303d listed impaired waterways	5=no 303d listing upstream 1= 303d listing upstream	Barrier-specific
Stream Temperature	Chehalis Thermalscape Model	5= <12 deg C 4=12-14 deg C 3= 14-17 deg C 2= 17-21 deg C 1=21-26 deg C 0=>26 deg C	Barrier-specific
2040 Future Stream Temperature	Chehalis Thermalscape Model	5= <12 deg C 4=12-14 deg C 3= 14-17 deg C 2= 17-21 deg C 1=21-26 deg C 0=>26 deg C	Barrier-specific
Canopy Cover - Opening Angle	NOAA (NHD-based dataset)	TBD	Barrier-specific

Coordination

- **Centralized Data**: Interactive tool based on WDFW's fish passage database with live data that is updated with repairs and new inventory.
  - Map contains all of the underlying data and visually displaces the 11 model metric information.

- **Synergy**: Help guide and inform fish passage restoration within the Chehalis to communicate with upstream and downstream jurisdictions and landowners to coordinate barrier corrections.
  - State Injunction, ASRP, SRFB, FFFPP, USFWS, NRCS, FBRB, etc…

Coordination

- **WSDOT Coordination**: Opportunity for project sponsors to focus on high-ranking sites that are upstream and downstream of WSDOT crossings.
  - **Example**: Model indicated high-ranking WSDOT site on Camp Creek, US 12.

(1 of 6)	
Barrier ID: 22.0349 0.70	
Barrier ID	22.0349 0.70
Total Score	136
Rank	17
Percentile	98.56
Stream Name	Camp Cr
Tributary To	Smith Canal
Owner Type	State
Feature Type	Culvert
Species Recorded	CH, CO, SH, SRCT, RT
Barrier Passibility (percent)	33

Zoom to
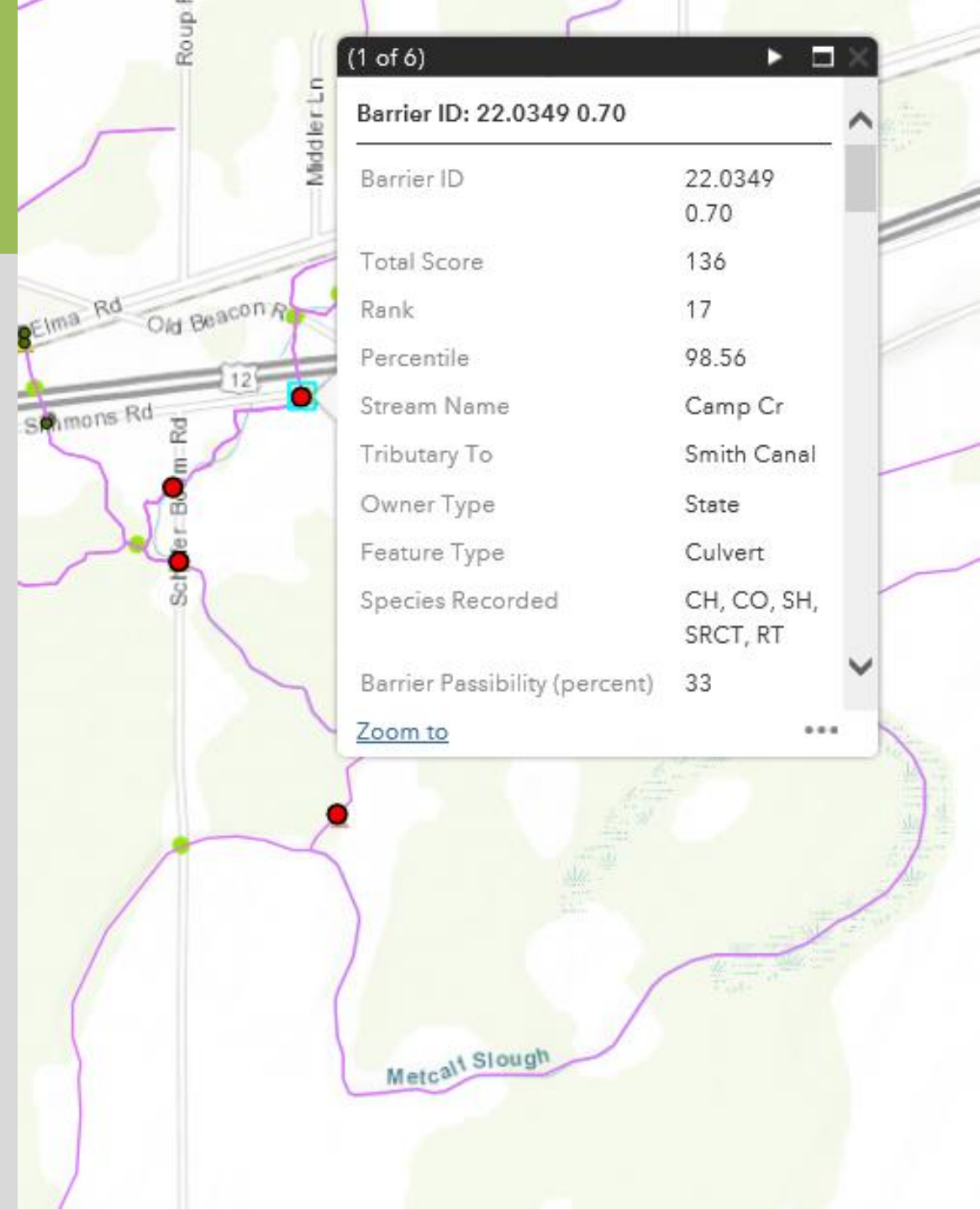
Coordination

- **Display 11 Metric Layers**

- **Query – Export Results**

- **WDFW Fish Passage Database**

- **Site Reports / Photos**

- **Barrier Corrections**

- **Check Habitat Gains**

Current Images

Upstream Chinook Habitat (miles)	0.00
Upstream Coho Habitat (miles)	6.27
Upstream Steelhead Habitat (miles)	5.53
Upstream Chum Habitat (miles)	2.78
Upstream Cutthroat Habitat (miles)	6.27
Number Species Benefitting	4
Number of Downstream Barriers	3
Downstream Barrier Minimum Percent Passable	33
Number of Upstream Barriers	11
Upstream Barrier Minimum Percent Passable	33
Road Density (mi/sqmi)	5.23
Water Quality 303d Listing	
Stream Temperature (Mean August degC)	16.33
Future (2040) Stream Temperature (Mean August degC)	17.48
Canopy Cover (percent)	
Chinook Habitat Quality (Avg IP score)	
Coho Habitat Quality (Avg IP score)	0.66
Steelhead Habitat Quality (Avg IP score)	0.28
Chinook Score	0
Steelhead Score	27
Coho Score	29
Searun Cutthroat Score	30
Chum Score	15
Non Species Specific Score	35

Leading the Way

- **Project Selection**: Help inform state and local jurisdiction how their priority projects align with basin wide priority crossings.

- **New Prioritization**: Model for more scientifically sound and cost-effective approaches to prioritize limited public investment dollars.
  - Several watersheds groups in Washington use this model as a template.

Questions / Contact Information

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Chehalis Fish Passage Barrier Prioritization:

https://dev-geodataservices.wdfw.wa.gov/hp/ChehalisPrioritization/index.html