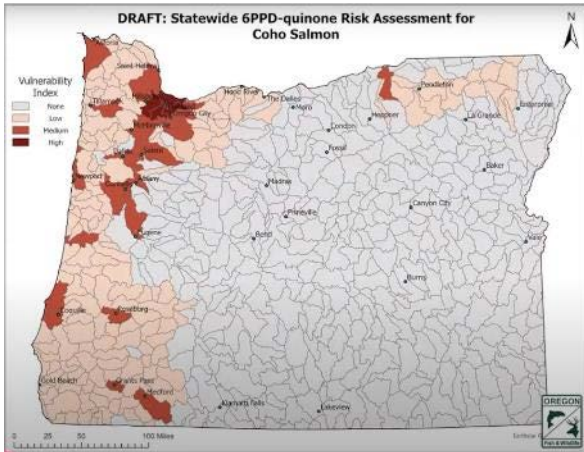




Oregon 6PPD-q Working Group

Defining our roles to reduce the impact of 6PPD-quinone on sensitive salmonids

Statewide Coordination, Prioritization, and Research



Roy Iwai, Multnomah County
Katie Holzer, City of Gresham
Oregon 6PPDq Working Group



Columbia River Inter-Tribal
Fish Commission



We Are All Salmon People

Salmon are one of the most important aspects of the cultures of the Indigenous peoples of the Columbia River Basin. They could rightly be called *Wy-Kan-Ush-Pum* or "Salmon People" for how completely these sacred fish shaped our cultures, diets, societies, and religions and continue to do so today.



Overview

- Context
- Oregon state-wide coordination
- Research - Case Study - Beaver Creek
 - Fish mortality
 - 6PPDq data
 - Porous pavement performance





Wild Fish Conservancy
N O R T H W E S T
S C I E N C E E D U C A T I O N A D V O C A C Y

Coho Prespawning Mortality Assessment in Washington and Oregon

EPA Assistance ID: X5-96007101-0

Final Report

January 2008



Figure 6. A prespawn mortality coho, Moxlie Creek, City of Olympia.

The distribution of our online information request form served as an educational tool, useful as much to inform aquatic resource managers of the salmon PSM phenomenon as to gather observations. Feedback from the information request combined with our own field survey results provides the first-ever list of streams in the Pacific Northwest with observations of PSM. However, additional survey and education efforts are needed to fully document PSM and inform aquatic resource managers in vulnerable watersheds.

Fish survey - Beaver Creek (Sandy River) 2010



Discovery of 6PPD-quinone - 2020

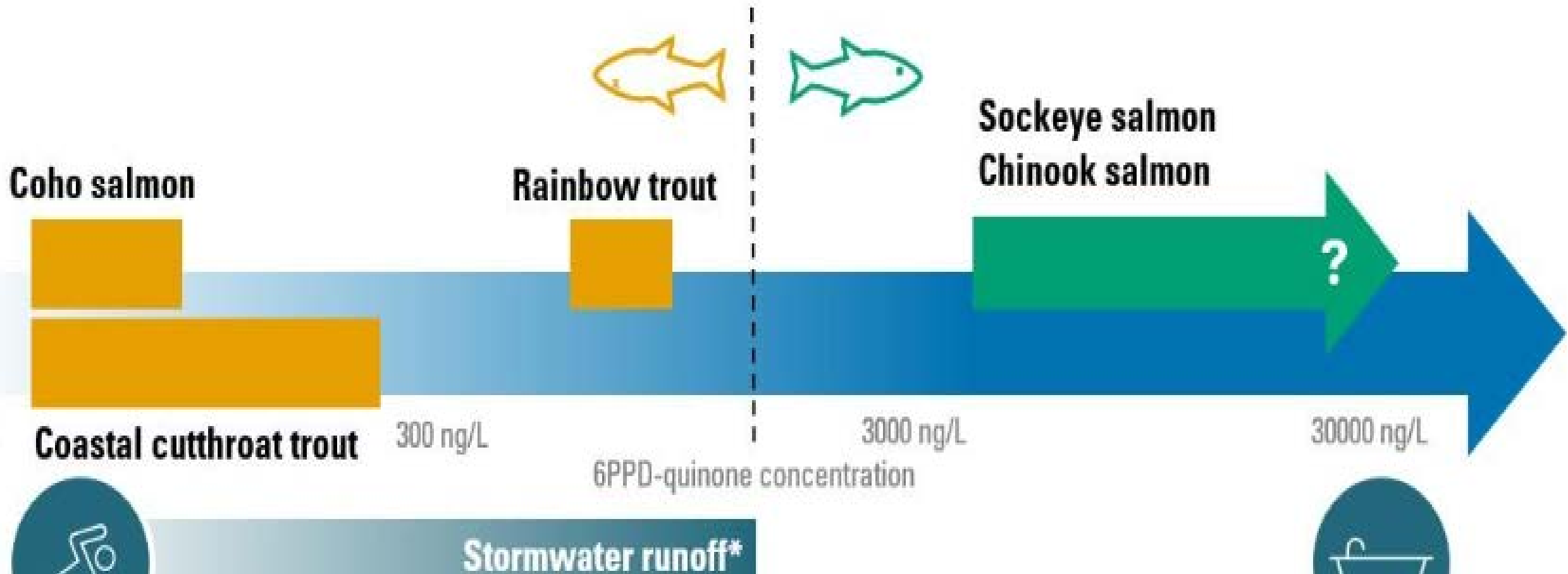


Video image: Dr Jennifer McIntyre, WSU



Photo: Mark Stone, UW

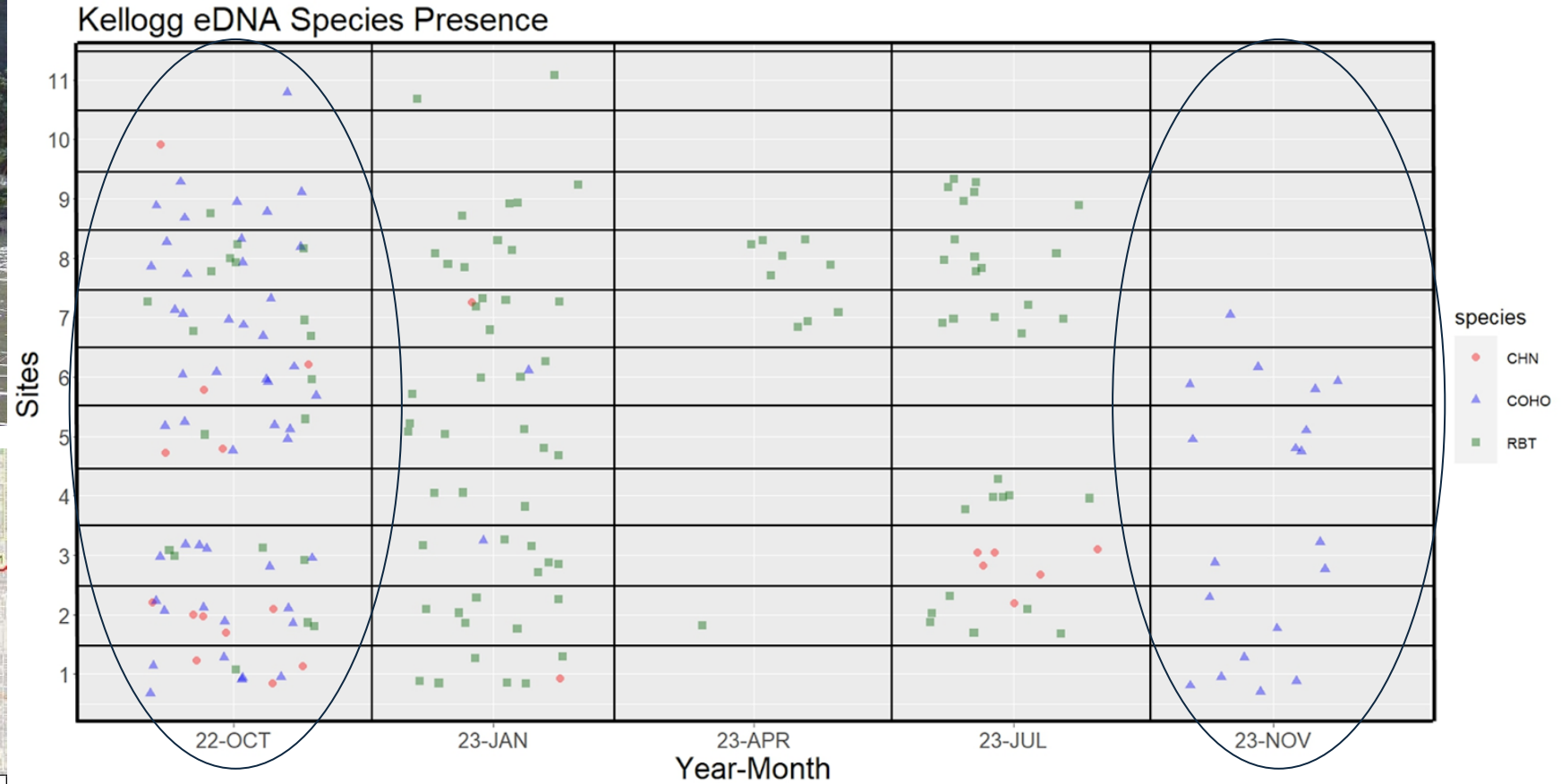
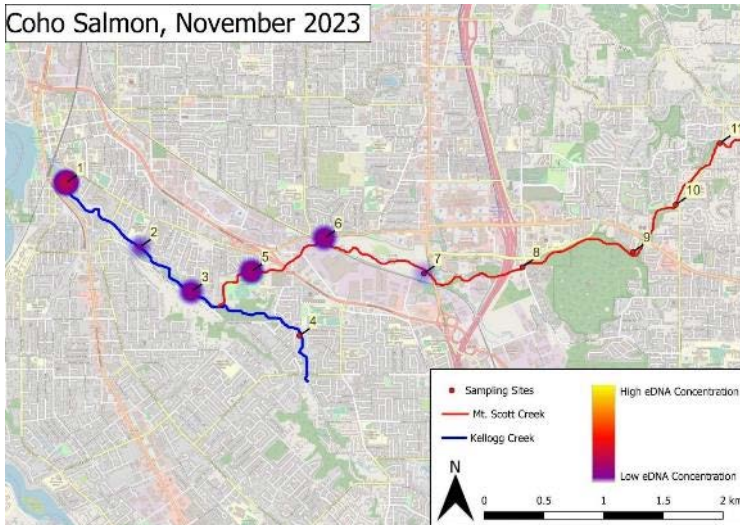
Lethal Toxicity for Salmonids



Kellogg Creek (Willamette River) eDNA data



Coho Salmon, November 2023



Oregon 6PPD-q Working Group

Voluntary Collaborative Partnership
for a solvable problem!

GOALS

1. Identify our roles and responsibilities
2. Define the extent of the problem
3. Identify actions to address the problem



Beaver Creek, Sandy River, Troutdale

Oregon 6PPD-q Working Group

1. Identifying roles and responsibilities

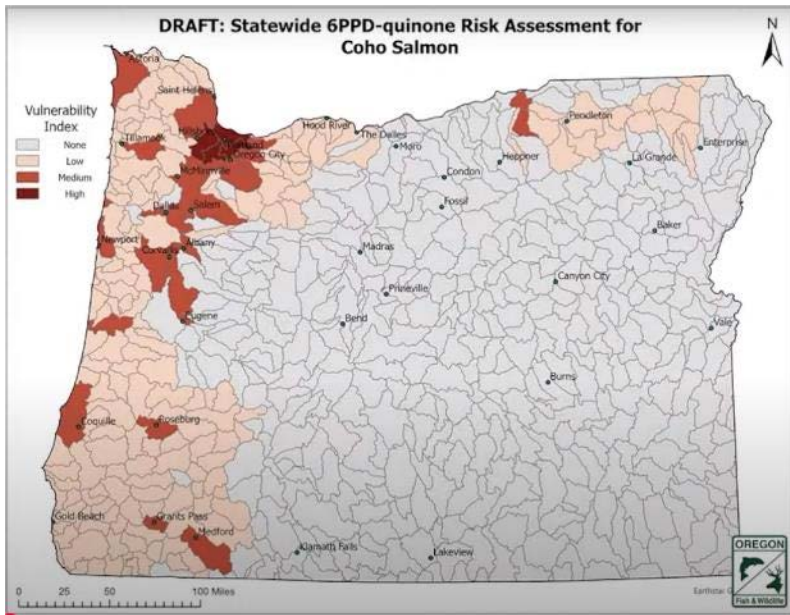
City and County Governments	Monitoring, stormwater prioritization
State and Federal Agencies	Monitoring, modeling, regulatory expertise
Columbia River Intertribal Fish Commission	Cultural knowledge and values, advocacy
Watershed Councils	Monitoring, stormwater projects, advocacy
Soil & Water Conservation Districts	Stormwater projects
Riverkeeper Organizations	Advocacy, networking
Universities and Colleges	Academic resources, research, training
Private parties	Engineering, planning



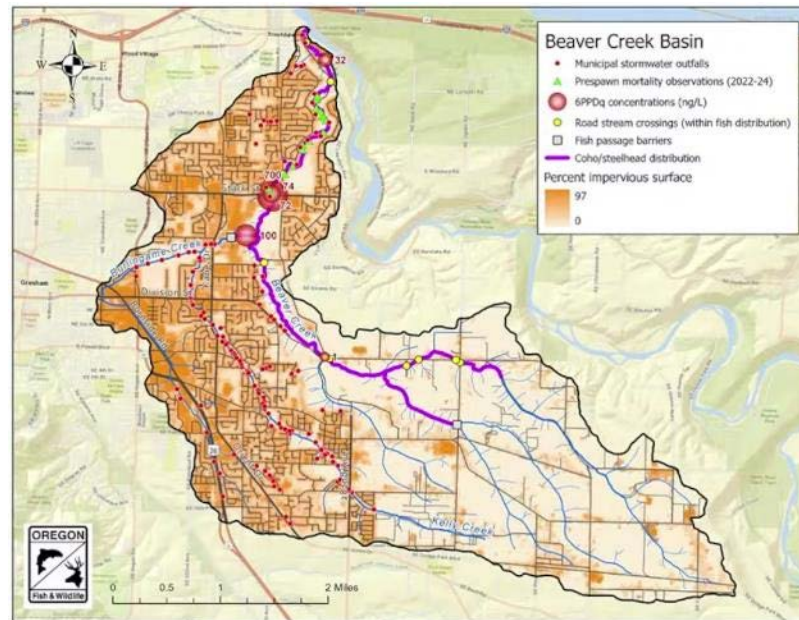
Beaver Creek, Sandy River, Troutdale

Oregon 6PPD-q Working Group

2. Defining the extent of the problem



Statewide Vulnerability Assessments



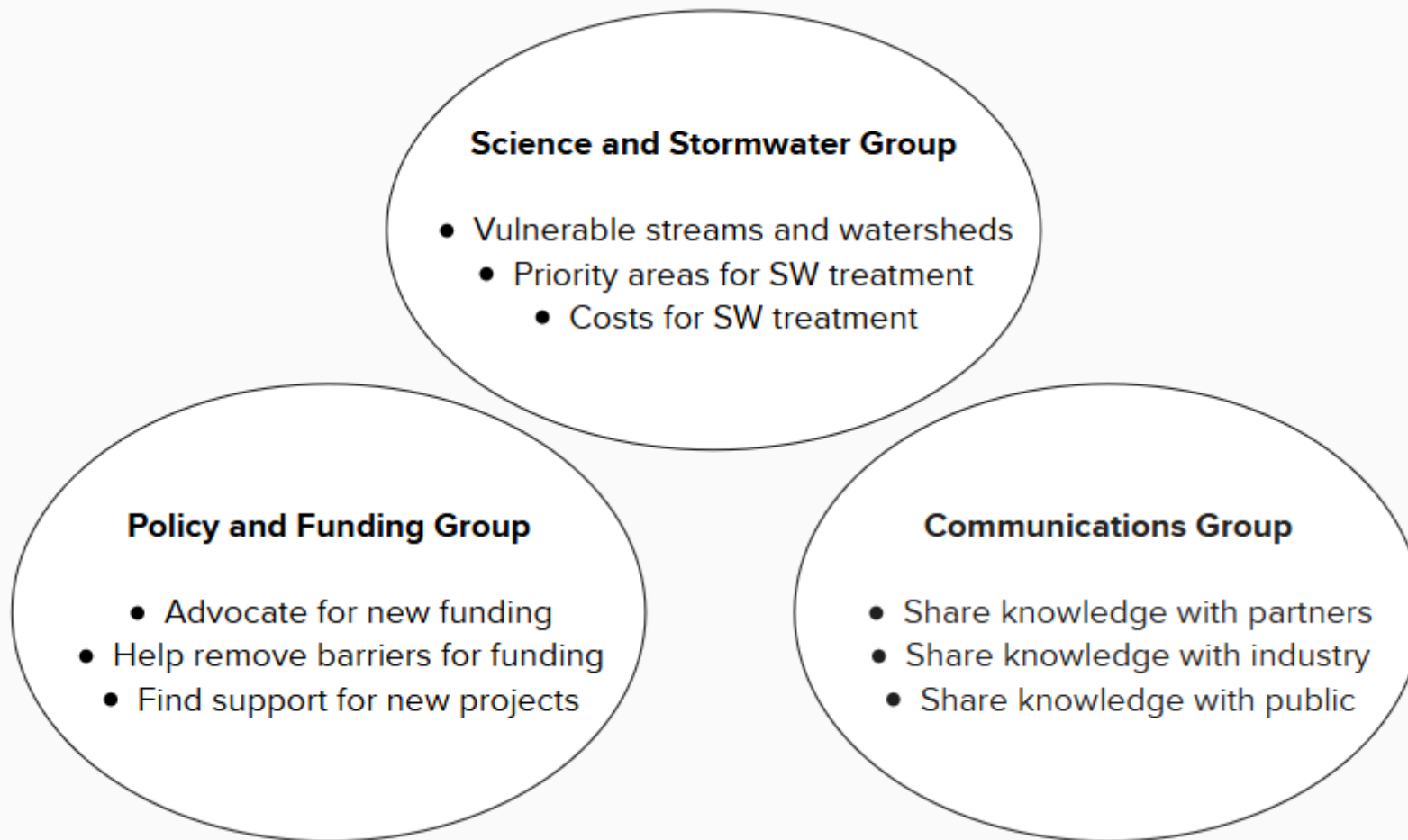
Local Stormwater Prioritization for stormwater projects



Beaver Creek, Sandy River, Troutdale

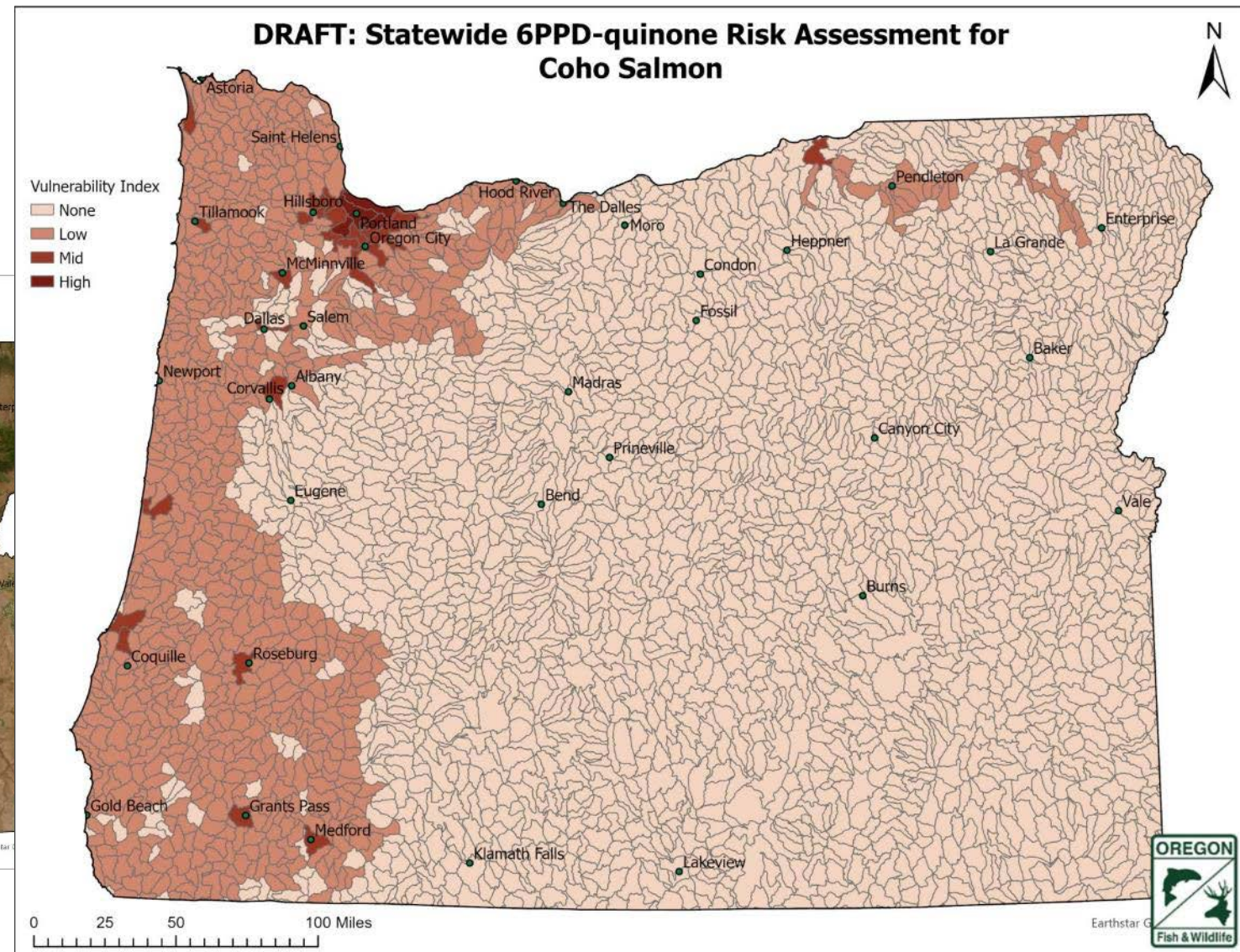
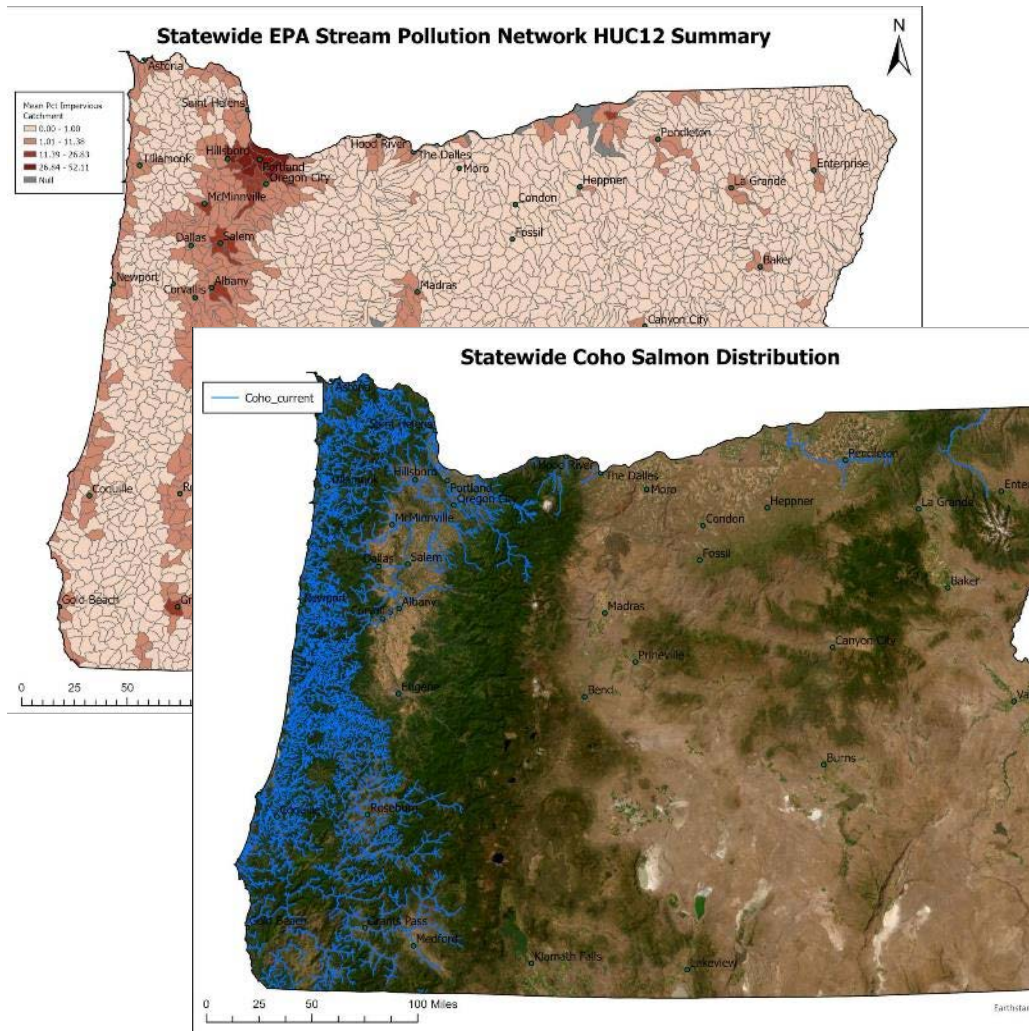
Oregon 6PPD-q Working Group

3. Identifying Actions



Stormwater treatment, SE 238th Ave

Success: ODFW Coho Vulnerability Assessment



Success: ODFW Commission Workshop



Oregon Fish and Wildlife Commission Workshop Agenda

Workshop:

Thursday, February 13, 2025 -1:00 PM

Kliever Memorial Armory

10000 NE 33rd Dr

Portland, OR 97211

Meeting:

Friday, February 14, 2025 - 8:00 AM

Kliever Memorial Armory

10000 NE 33rd Dr

Portland, OR 97211

Thursday, February 13, 2025

*This meeting will be live streamed to YouTube and can be viewed at
<https://www.youtube.com/user/TEODFW/videos>*

1:00 – 2:45 WORKSHOP #1: AN INTRODUCTION TO 6PPD-q AND THE RISKS OF HIGHWAY RUNOFF TOXICITY TO FISH AND AQUATIC SYSTEMS

- 1:00 **Welcome, Setting the Stage**
 Sarah Reif, ODFW Acting Deputy Director
 Dr. Leslie King, Commissioner
- 1:10 **Overview of 6PPD-q**
 Spencer Sawaske, ODFW Deputy Administrator Habitat Division
 Becky Anthony, ODFW Water Quality Mitigation Specialist
- 1:20 **What is happening in Oregon**
 Ben Walczak, ODFW North Willamette Watershed District Fish Biologist
 Todd Hanna, Mt. Hood Community College Fisheries Instructor
 Jennifer Karps, Bureau of Environmental Services Integrated Solutions Coordinator
 Pablo Martos, DEQ Senior MS4 Permit Writer
 Adam Stonewall, USGS Hydrologist
 Q&A with Commissioners
- 1:55 **Solutions and Next Steps**
 Katie Holzer, City of Gresham Senior Environmental Specialist
 Jennie Morgan, ODOT Stormwater Asset Management Program Coordinator
 Roy Iwai, Multnomah County Water Resources Specialist, Chair of the Oregon 6PPD-q Working Group
- 2:20 **Commissioner Q&A, Roundtable Discussion with Invited Guests**
- 2:45 **ADJOURN WORKSHOP #1; BREAK 30 MIN.**



6PPD-quinone

February 13, 2025

Spencer Sawaske, Deputy Habitat Division Administrator

Becky Anthony, Water Quality Specialist



Oregon Department
of Fish and Wildlife

<https://www.youtube.com/watch?v=HjAQ7FaKcUw&t=2419s>

This information session helped raise the issue with our state wildlife agency

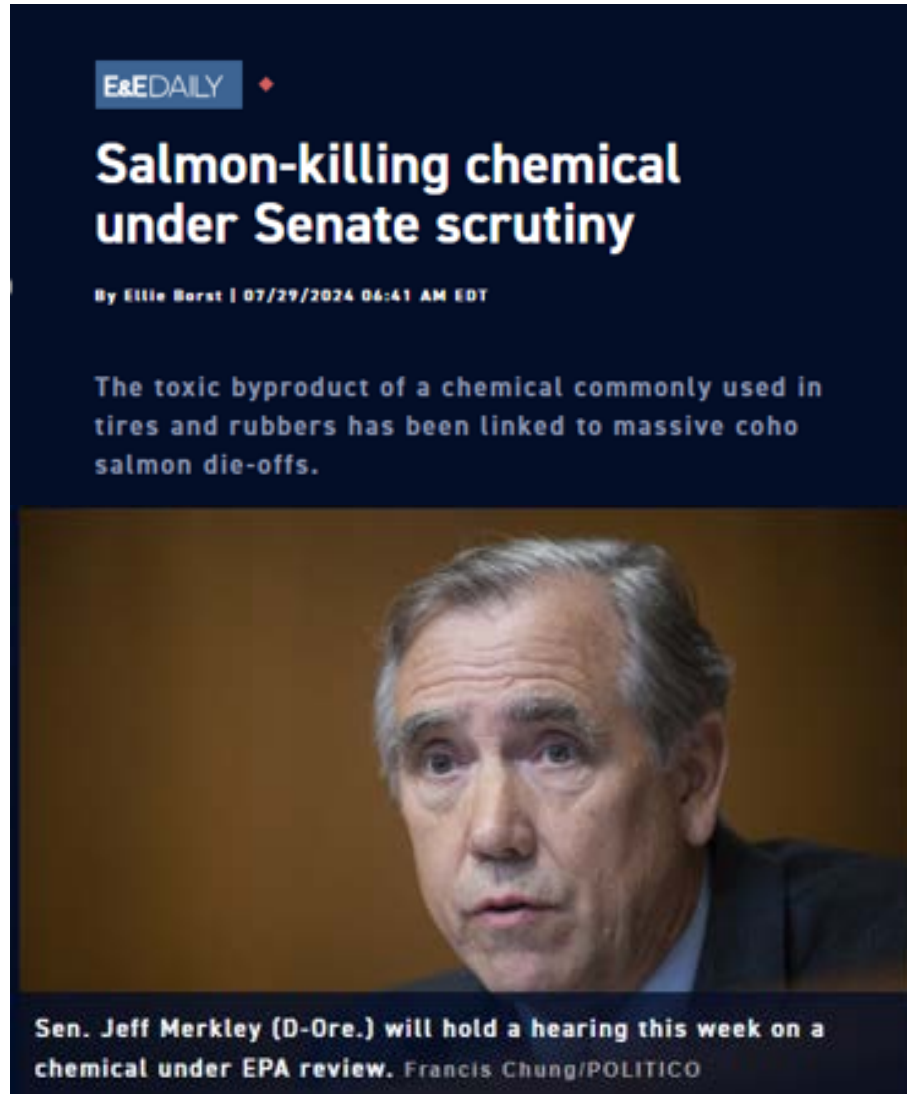
Testimony on HB 3362 - Tire Pollution Tax



House Bill 3362 would establish a “Tire Pollution Prevention and Mitigation Fund” that would fund projects to reduce the effects of 6PPDq in stormwater on salmonids.

Many non-governmental partners provided testimony in support of this bill

Success: Work with Senator Merkley



Stormwater tours for Sen Merkley's staff have led to discussions about new federal transportation funding for projects to treat existing stormwater

Success: Partnership with Washington

6PPD “lines of inquiry” and active groups*

Product Replacement

Ecology HWTR
Interstate (CA, others)
USEPA
USTMA
Salmon Safe

Analytical Methods

UW Tacoma
Ecology MEL
USEPA
Private labs

Biological Effects

WSU Puyallup
NOAA
USFWS
WDFW
Toxics Workgroup

Stormwater Management

Ecology WQP
SAM
WSDOT
WA Stormwater Center
PS Recovery SIL
SWG 6PPD Subgroup

Geography/ Priorities

NOAA/USFWS
WDFW/WDNR
UW Tacoma
Ecology EAP
Tribes

SWG 6PPD Subgroup

* *Not an exhaustive list!*

Further Actions

Statewide and Regional Actions

- Statewide vulnerability assessment for sensitive fishes in Oregon
- Increase statewide monitoring of 6PPD-q and salmonid pre-spawn mortality
- Study the cost of stormwater treatment on priority road segments in Oregon
- Build support from Congress and Oregon Legislature and federal and state agencies to increase funding for stormwater treatment
- Research BMP effectiveness studies
- Identify new training needs (porous pavement)

Local Actions

- Identify levels of fish mortality in local streams
- Identify local priorities for stormwater treatment
- Identifying and constructing stormwater treatment projects
- Identifying barriers to implementation for porous pavement
- Coordinating grant proposals for watershed councils and local jurisdictions
- Communicate the impact of 6PPDq in local communities

And more! This requires inspiration and collaboration!

Case Study: Beaver Creek, Sandy River

13 native fish species, including:

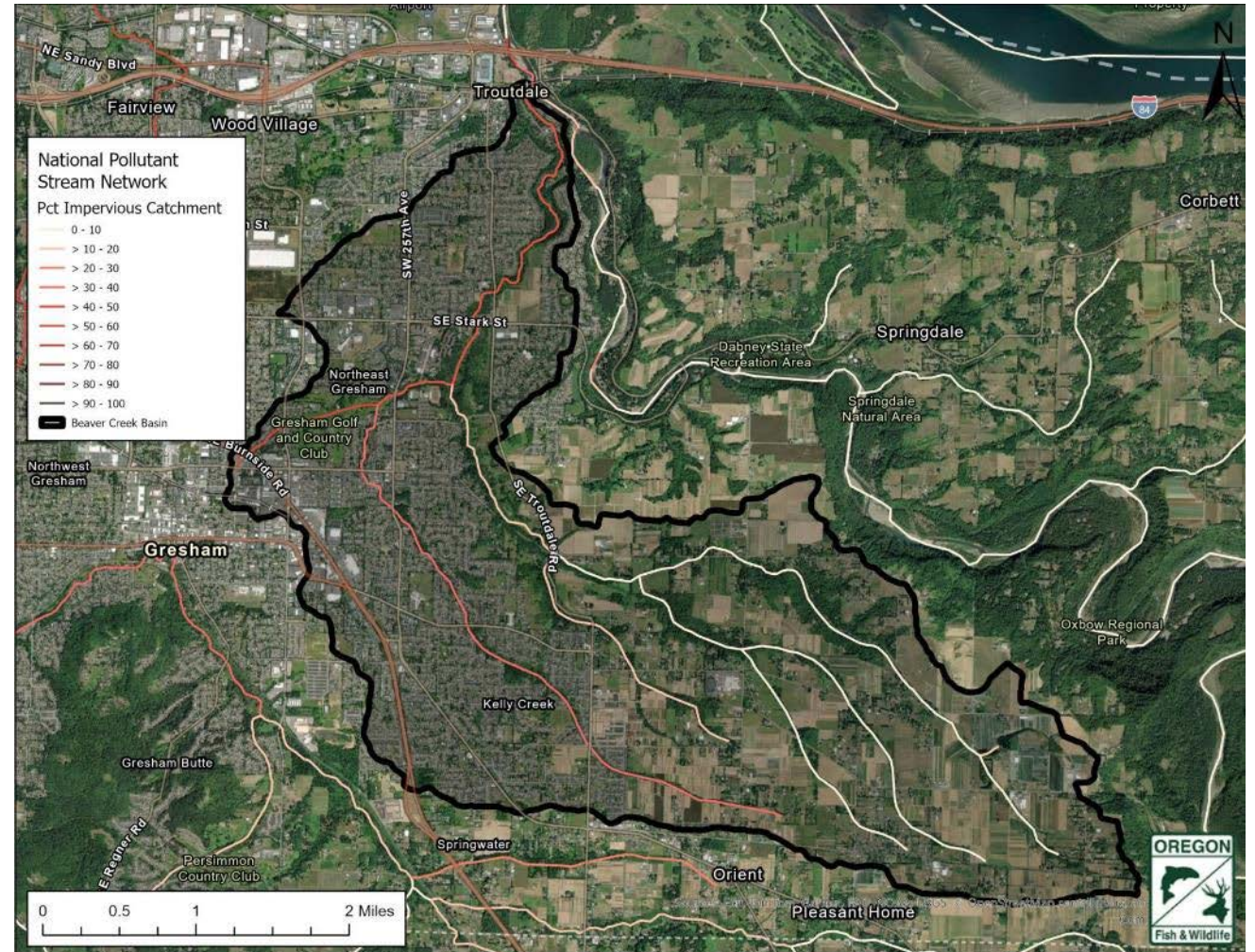
- coho, Chinook, steelhead

Watershed characteristics:

- ~13.5 sq miles
- ~20 miles of stream
- ~15 miles of arterial roads
- riparian and culvert restoration

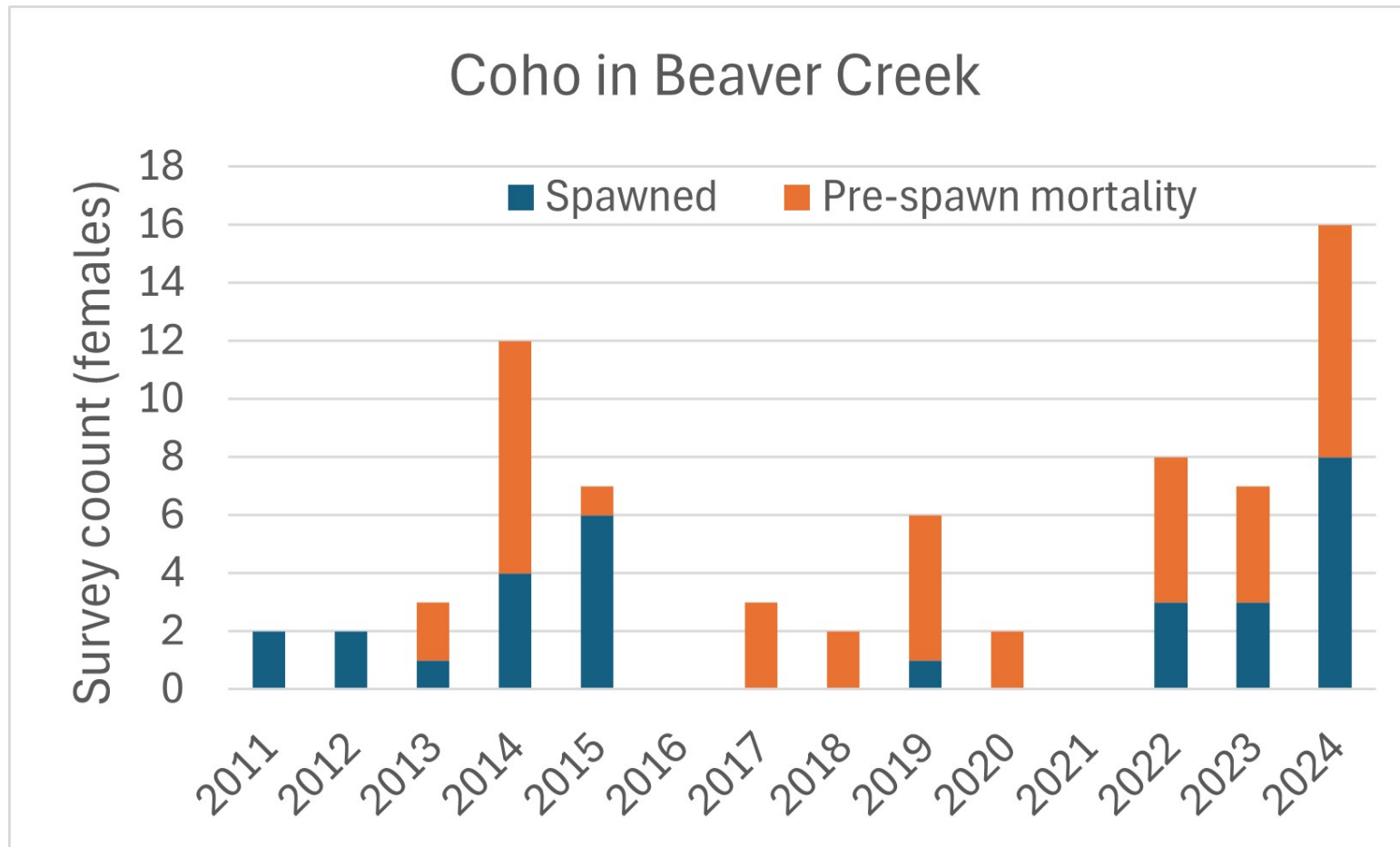
Monitoring by existing partnership:

- smolt trapping
- adult salmon spawner survey
- water quality
- macroinvertebrates
- flow gauge



Beaver Creek Pre-spawn Mortality

- Fall spawning surveys in Beaver Creek from MHCC students since 2011
- Female Coho generally >50% pre-spawn mortality in urban reaches



Beaver Creek Instream Data – Storm event

USGS Beaver Creek flow gauge:

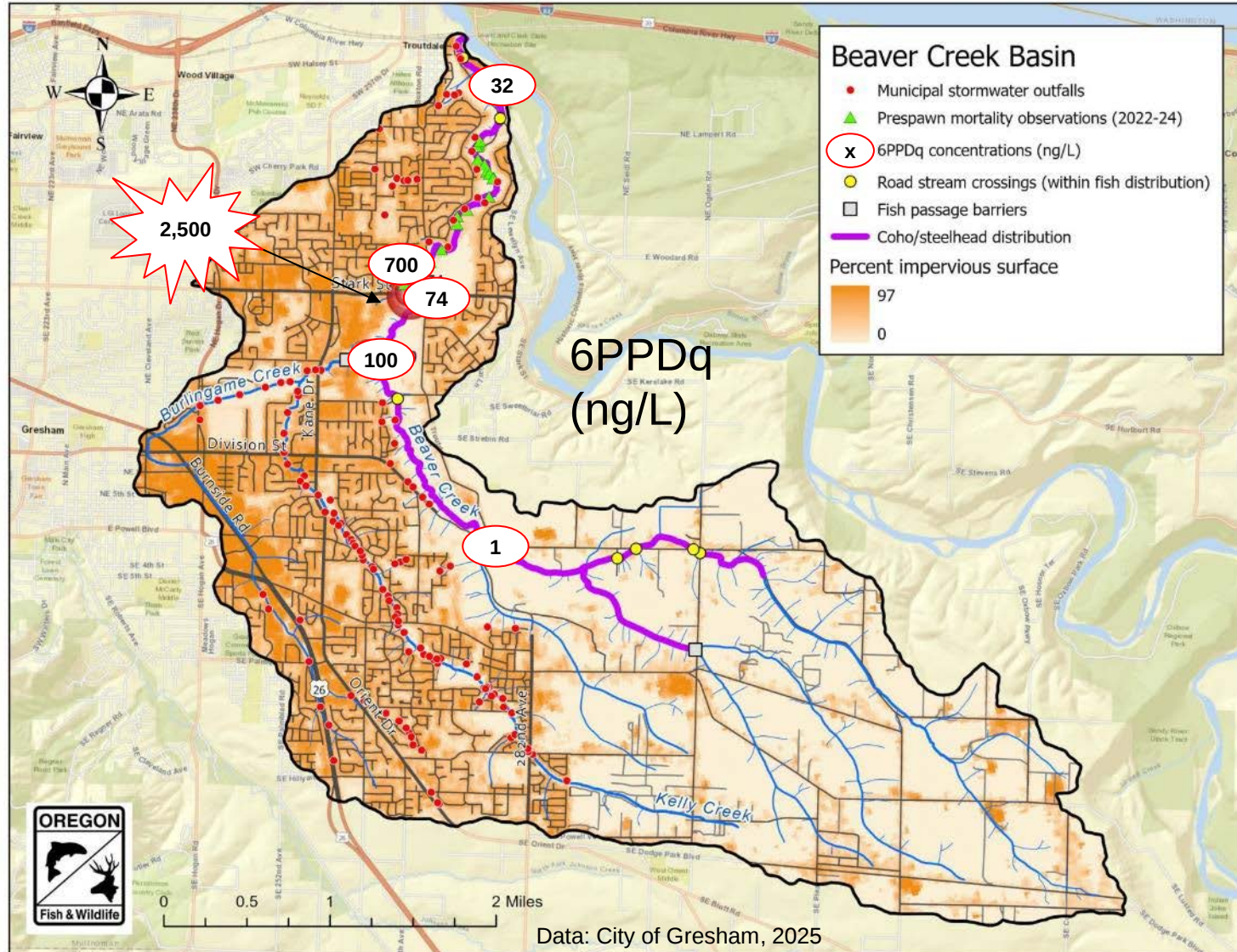
- Stark St culvert in Troutdale

Sample date:

- Jan. 31, 2025
- after 3-week dry period

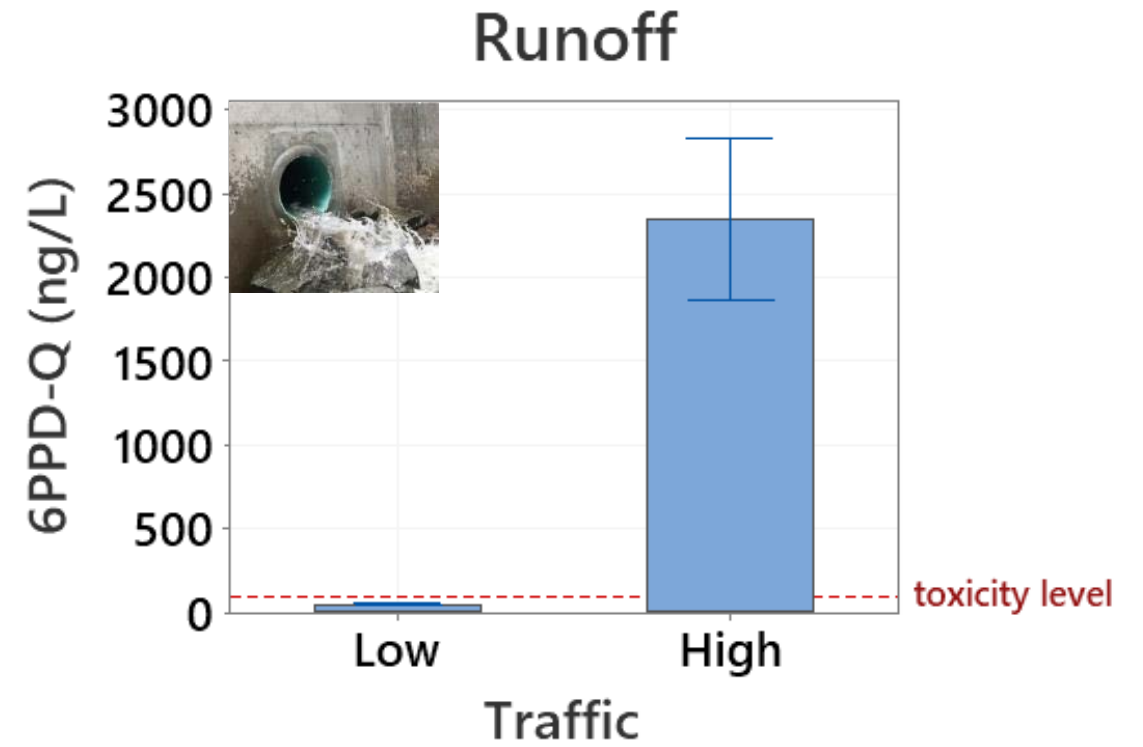
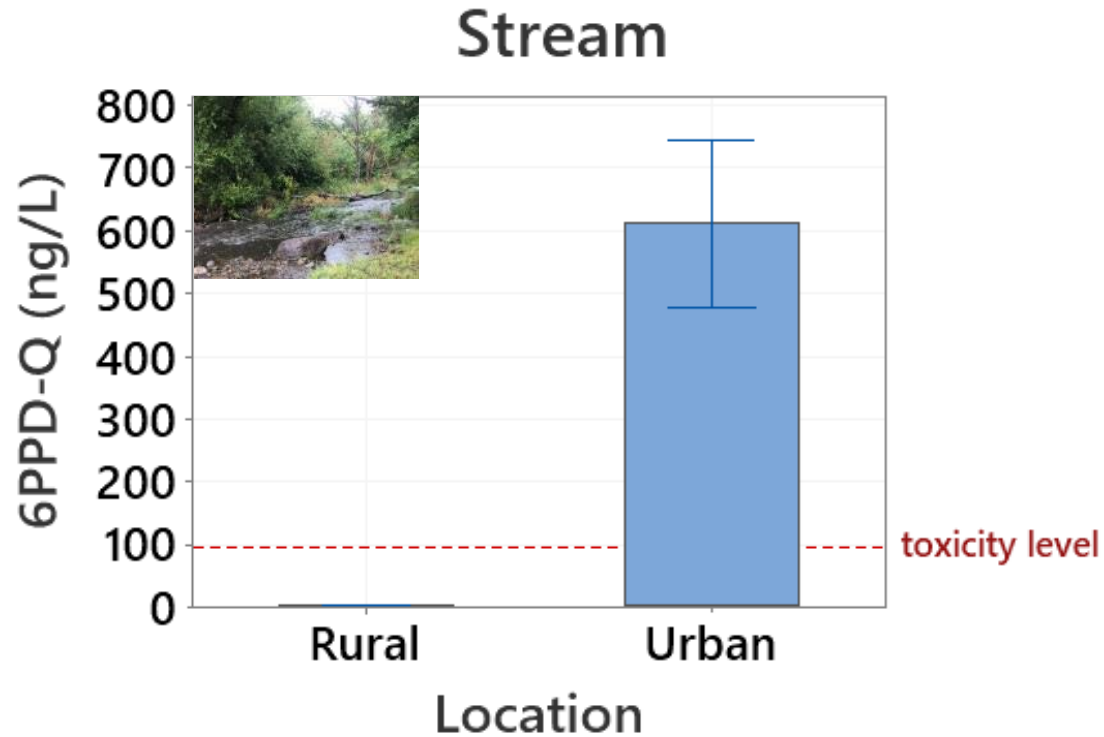


Beaver Creek Instream Data

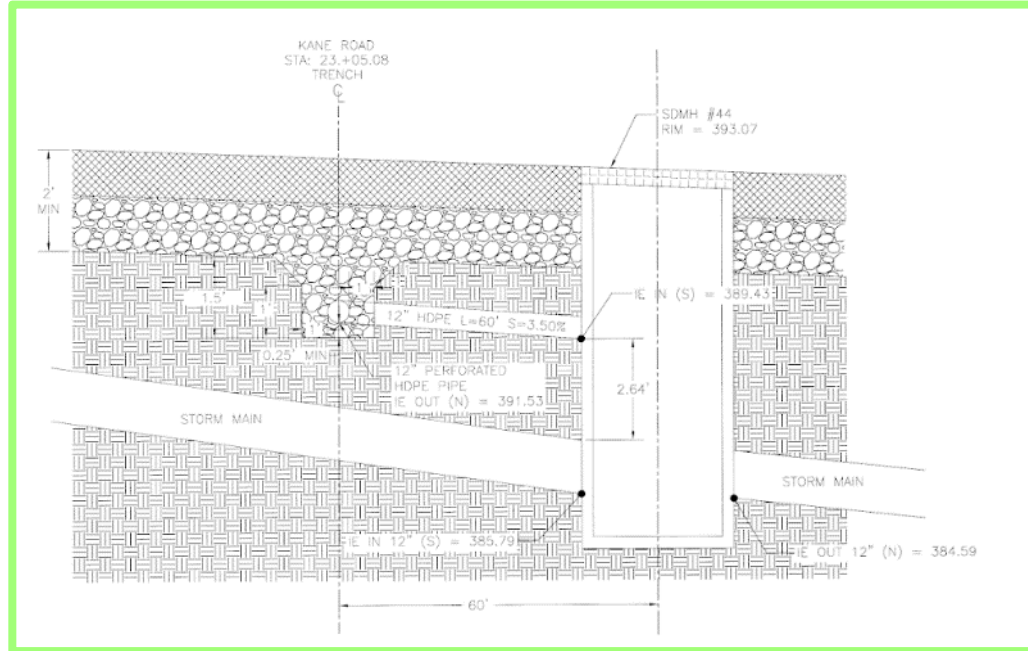


Rural and Urban 6PPD

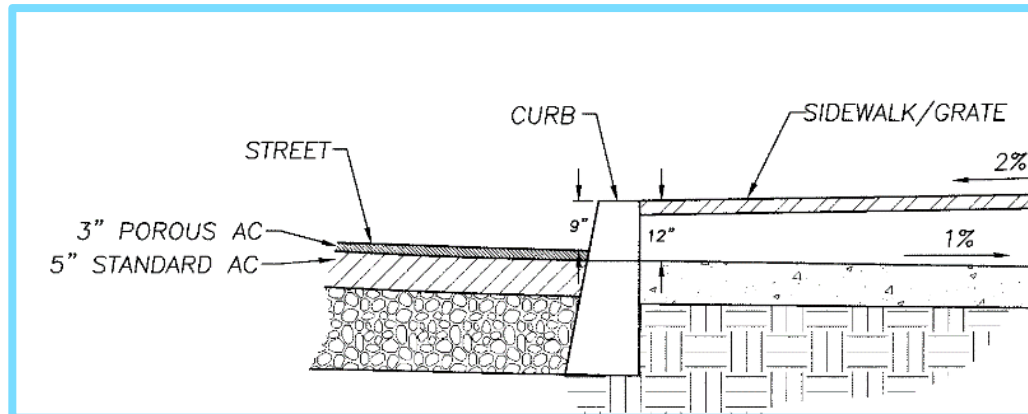
Current data from Oregon, Washington, California, Canada, and Australia



Arterial Road Water Quality: Kane Road Study Locations and Pavement Types



Full-Depth Porous



Graphic: City of Gresham

Study Methods

Samples

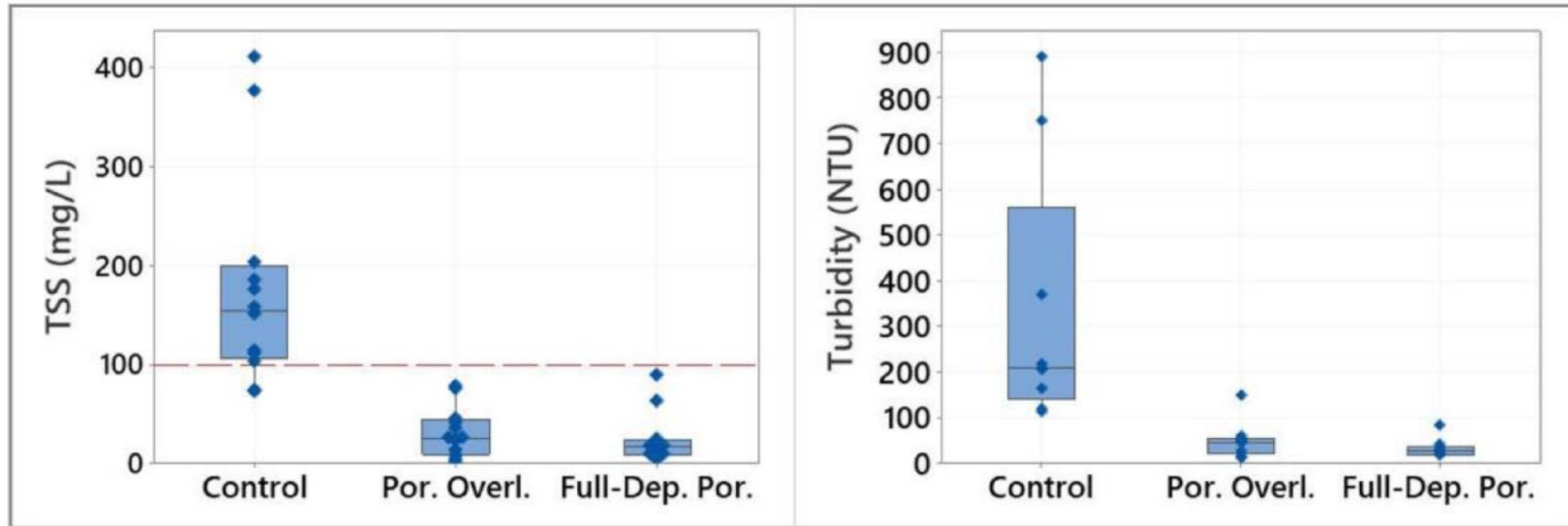
- Five storms 2016-2024
- (pavement is 9-16 years old)
- 3 grab samples per site per storm

Pollutants

- Field, sediment, nutrients, metals, PAHs, phthalates, *E. coli*, 6PPD-q



Results



Low intensity storm



Medium intensity storm



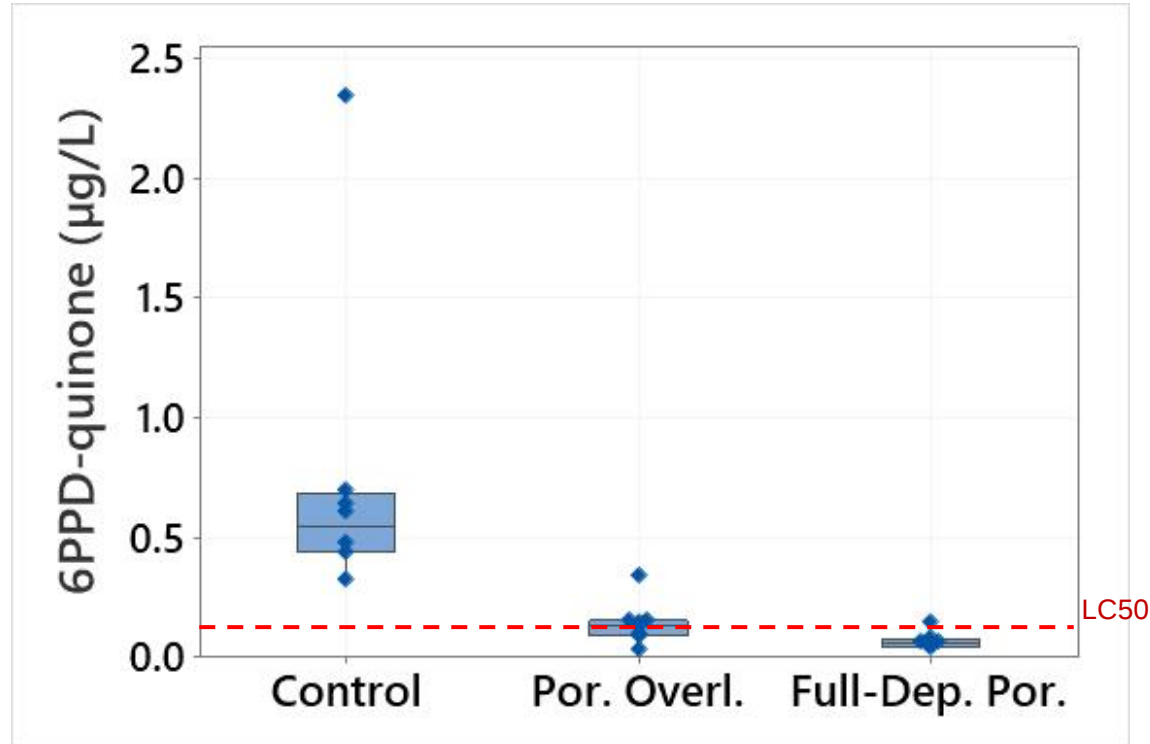
High intensity storm



6PPD-quinone



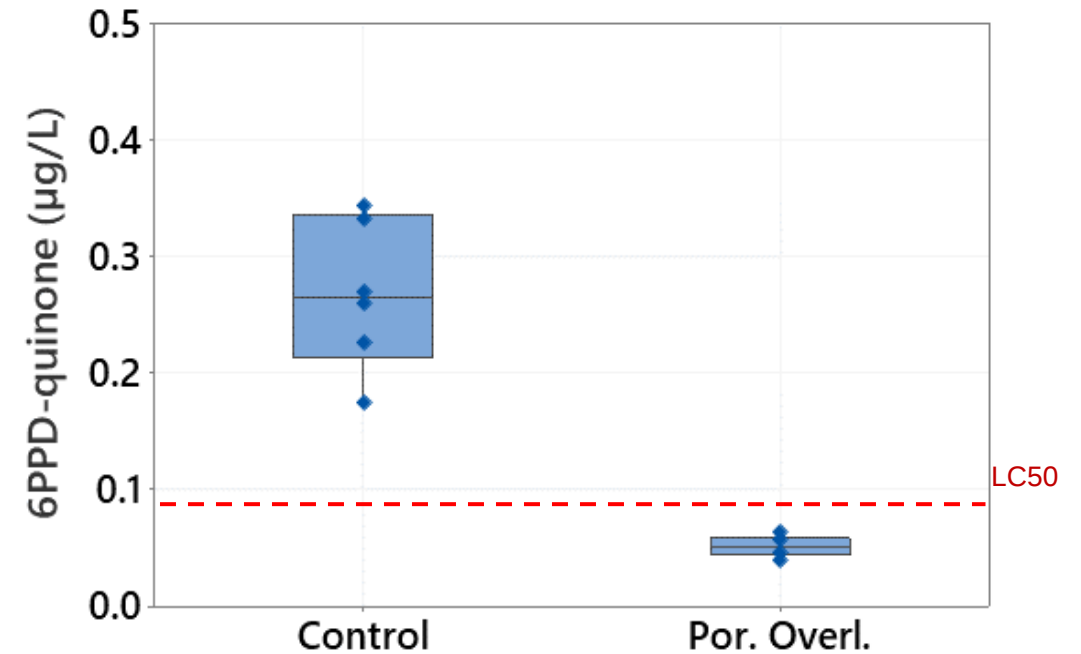
Kane Road, City of Gresham



Reduced 6PPD-q by ~80-90%!

Note: Fish survival not tested

Lake Road, City of Milwaukie



Similar preliminary results from a new arterial road overlay in Milwaukie

Porous Pavement Publication



Article

Reduction of Runoff Pollutants from Major Arterial Roads Using Porous Pavement

Katie Holzer ^{1,*} and Cara Poor ² 

¹ City of Gresham, Gresham, OR 97030, USA

² Shiley School of Engineering, University of Portland, Portland, OR 97203, USA; poor@up.edu

* Correspondence: katie.holzer@greshamoregon.gov

<https://www.mdpi.com/2071-1050/16/17/7506>

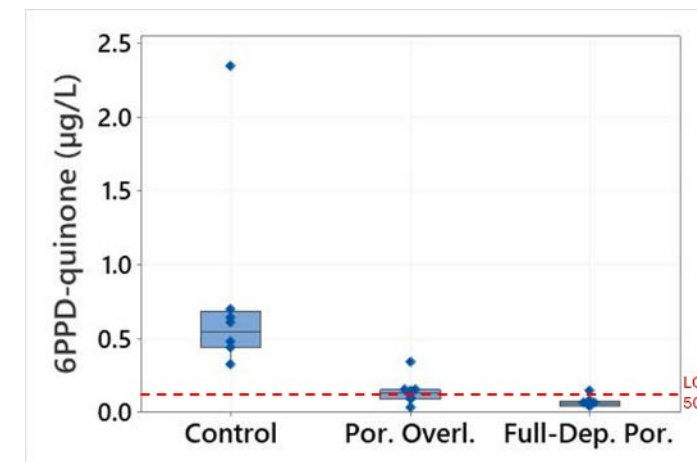
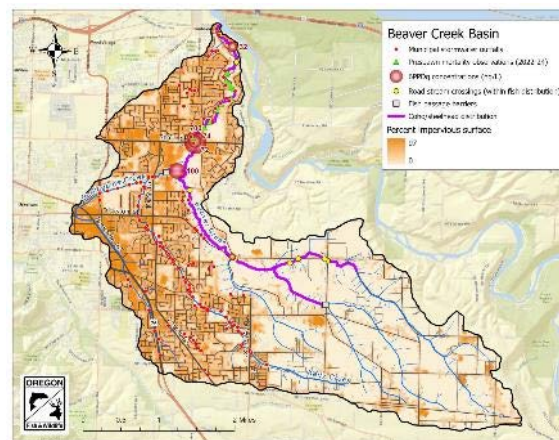
Seeking TAPE Certification

WA Dept of Ecology and ODOT collaboration



Summary: Case Study – Beaver Creek

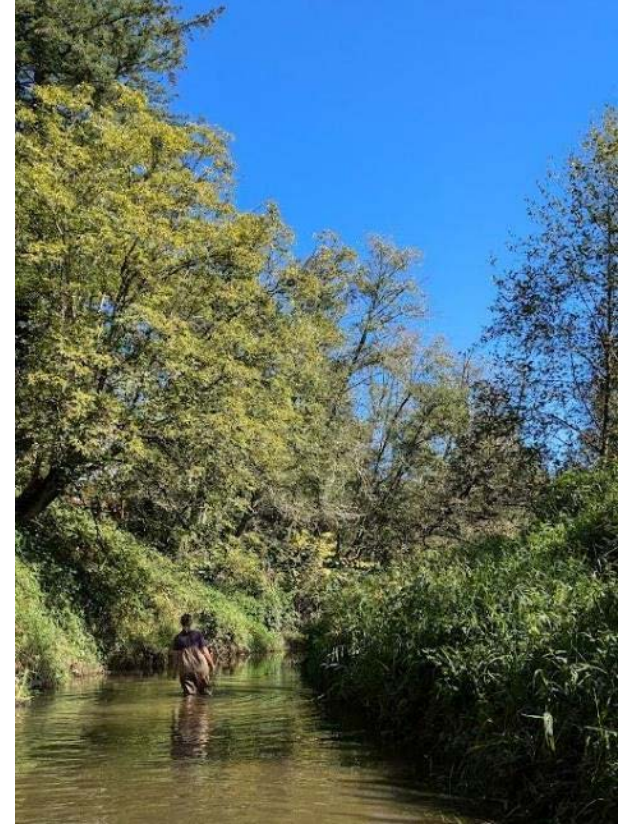
- High pre-spawn mortality
- 6PPD-q concentrations are more than 50 times the EPA guidance in some spots
- Some road sections have treated runoff and ~90% less 6PPD-q
- Could apply treatment on all 15 mi of major roads draining to this creek
- Can the Beaver Creek watershed serve as a pilot area?



Conclusion

- Oregon is coordinating broadly on 6PPD-q
- 6PPDq is found in urban streams with coho mortality in Oregon
- Runoff from high-traffic roads has the highest concentrations
- Treatment with porous pavement and/or other technologies
- Funding is needed for monitoring and stormwater treatment
- Let's continue to collaborate broadly and not miss out!

This problem is manageable and solvable!



Questions?

Oregon 6PPDq Working Group

<https://www.tryoncreek.org/6ppd-q/>

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Katie.Holzer@GreshamOregon.gov

