

Endangered Species Act and Stormwater in Puget Sound

Peninsula RTPPO

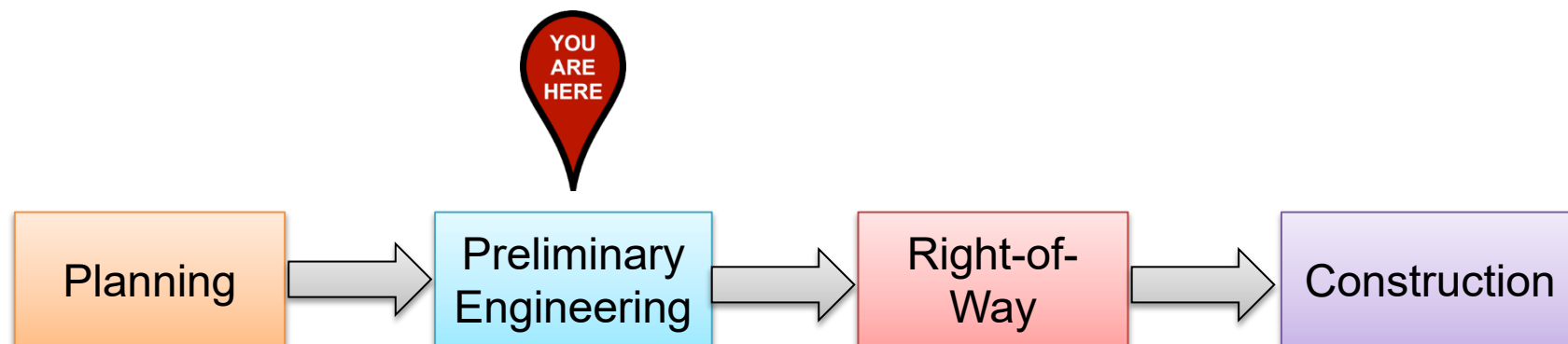
Melanie Vance

WSDOT Local Programs

Environmental Manager

January 20, 2022

Project Development Continuum



- Design the project

- NEPA starts ~ 30% design



- Formal ESA ~ 60% design



- NEPA complete after
ESA is complete.



How Did We Get Here?

1. 1999, 2007 – Puget Sound Chinook, Steelhead, listed under ESA
2. 2009 - HI-RUN developed and approved for use in Western WA to analyze stormwater effects to salmonids.
3. 2010 - Deepwater Horizon spawned research.
4. Mid 2010s - Polycyclic Aromatic Hydrocarbons (PAHs) cardiac toxicity identified.
5. Mid 2010s – Urban Stream Mortality Syndrome studied in Puget Sound.
6. 2020 – 6PPD-Quinone “Tire Leachate” identified as the cause of Urban Stream Mortality Syndrome.

HI-RUN asks...

Will the project improve or degrade water quality?

End of Pipe Loading

- Results tell if pollution load is likely to increase or decrease over baseline condition.
- Targets are Cu, Zn, Sediment

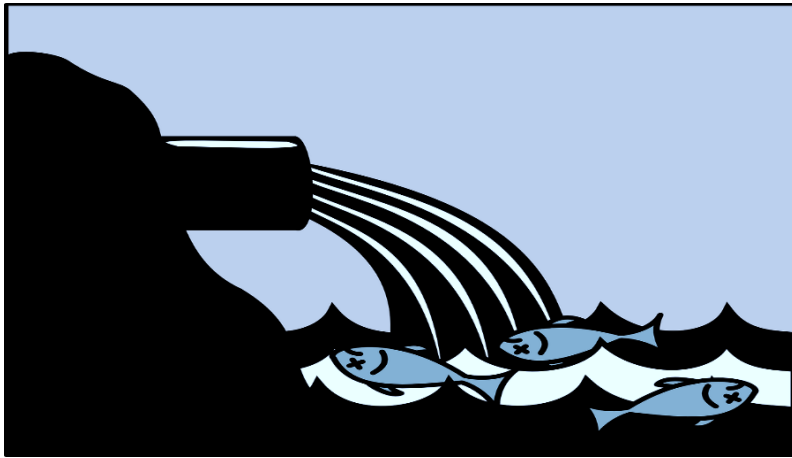


Image Source: Pixabay

Dilution

- Looks at exposure potential
- Predicts plume length before concentration dissipates to background levels.

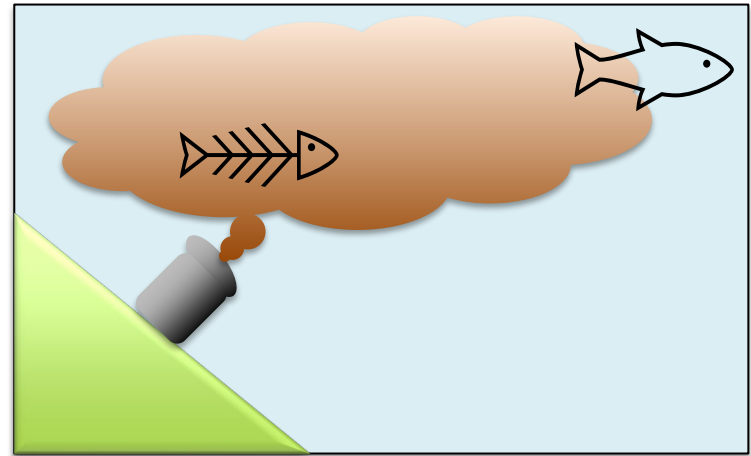


Image Source: Created by Melanie Vance

Deepwater Horizon Lesson - PAH Toxicity to Many Fish

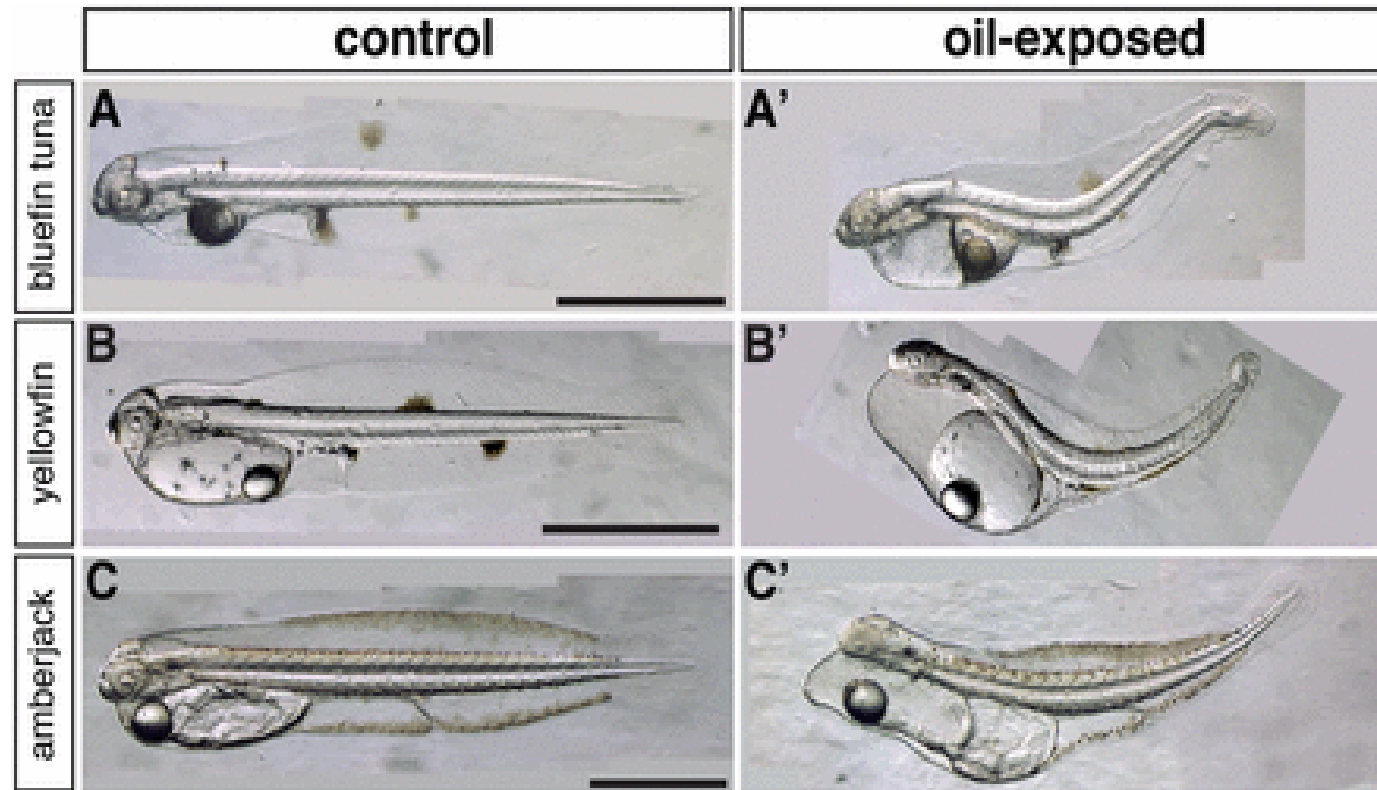


Photo Credit: Dr. John Icardona et al, 2014

Urban Stream Mortality Syndrome

Environmental
Science & Technology

SCCWRP # 1057

Article

Cite This: Environ. Sci. Technol. 2018, 52, 10317–10327

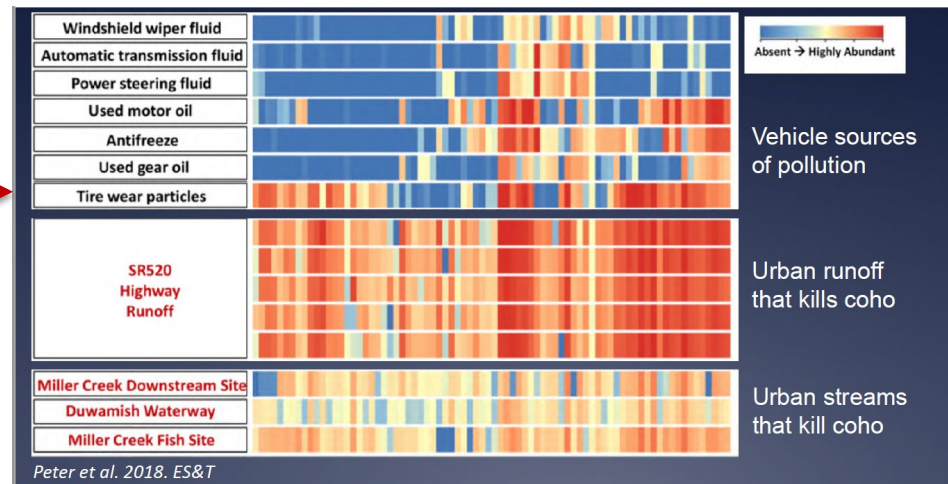
pubs.acs.org/est

Using High-Resolution Mass Spectrometry to Identify Organic Contaminants Linked to Urban Stormwater Mortality Syndrome in Coho Salmon

Katherine T. Peter,^{*,†,‡,§} Zhenyu Tian,^{†,‡,§} Christopher Wu,[‡] Peter Lin,[‡] Sarah White,[‡] Bowen Du,^{||} Jenifer K. McIntyre,⁺ Nathaniel L. Scholz,[#] and Edward P. Kolodziej^{†,‡,§}

What's in stormwater?

Common Component





The Culprit = 6PPD-Quinone

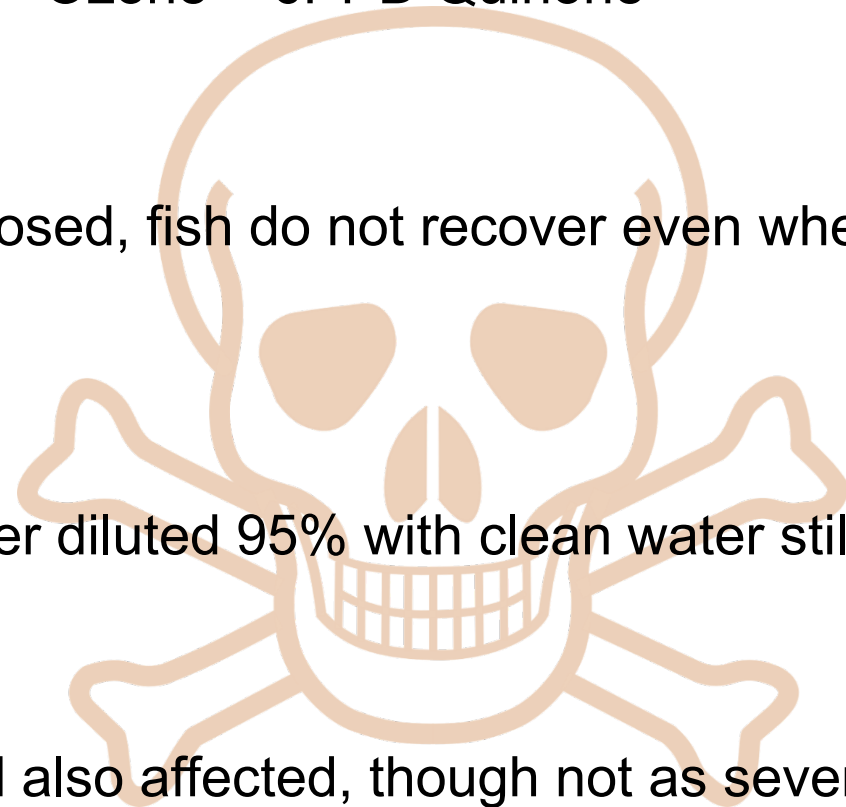
- Tire Dust + Ozone = 6PPD Quinone
 - Once exposed, fish do not recover even when placed in clean water.
 - Stormwater diluted 95% with clean water still harms fish.
 - Steelhead also affected, though not as severely as coho.
- 

Image Source: Pixabay

According to NMFS now...

“Better Than Baseline $\neq$ Benefit”

- Old ESA Policy
- HRM



- New science
- Toxicity is acute and irreversible.
- Design storms are often exceeded.

Image Source: Pixabay



Stormwater and the ESA

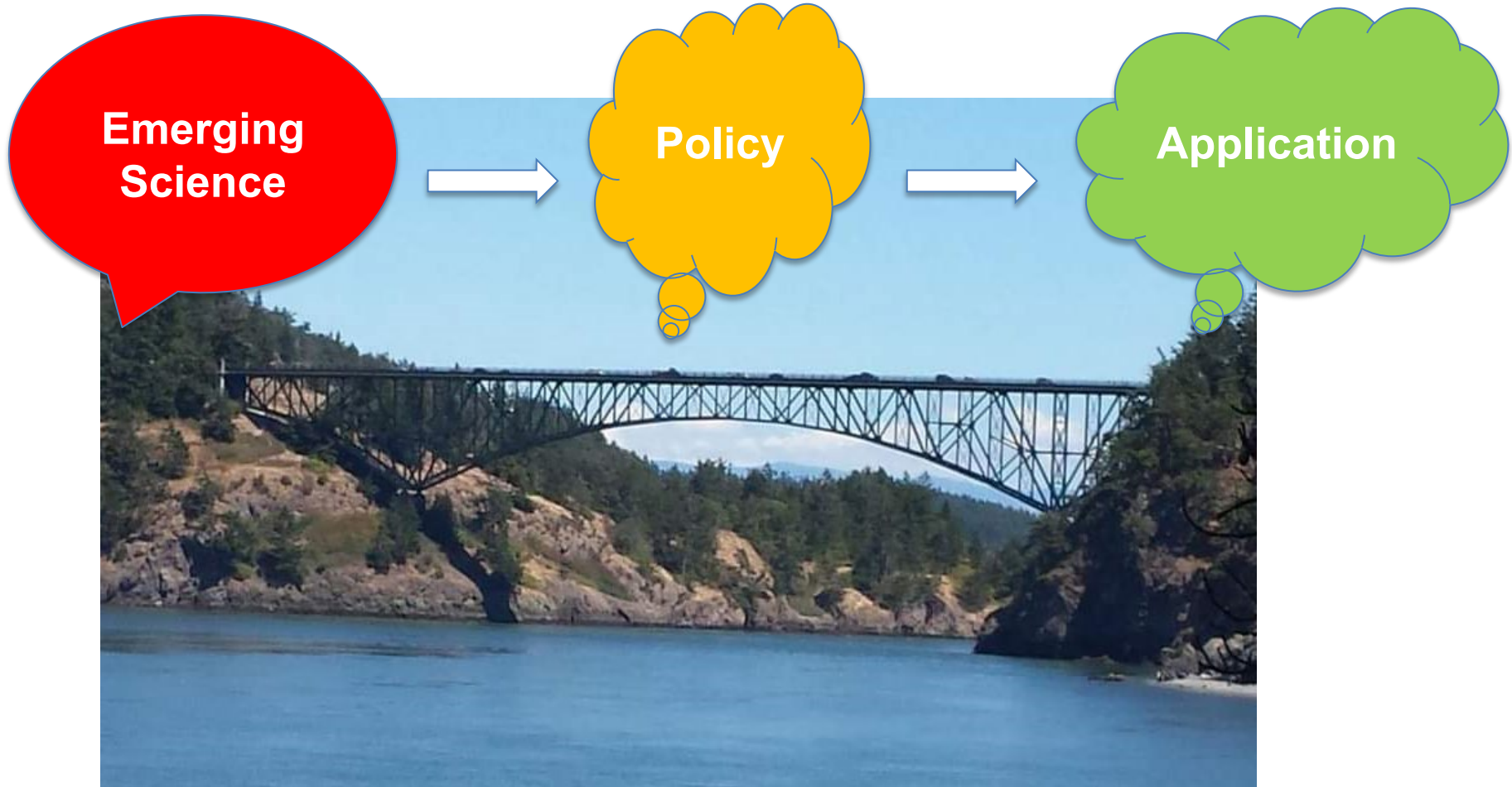


Photo Credit: Melanie Vance, SR 20 over Deception Pass

Q: What Removes PAHs?

A: Infiltration! Bioretention! (Rain Gardens)

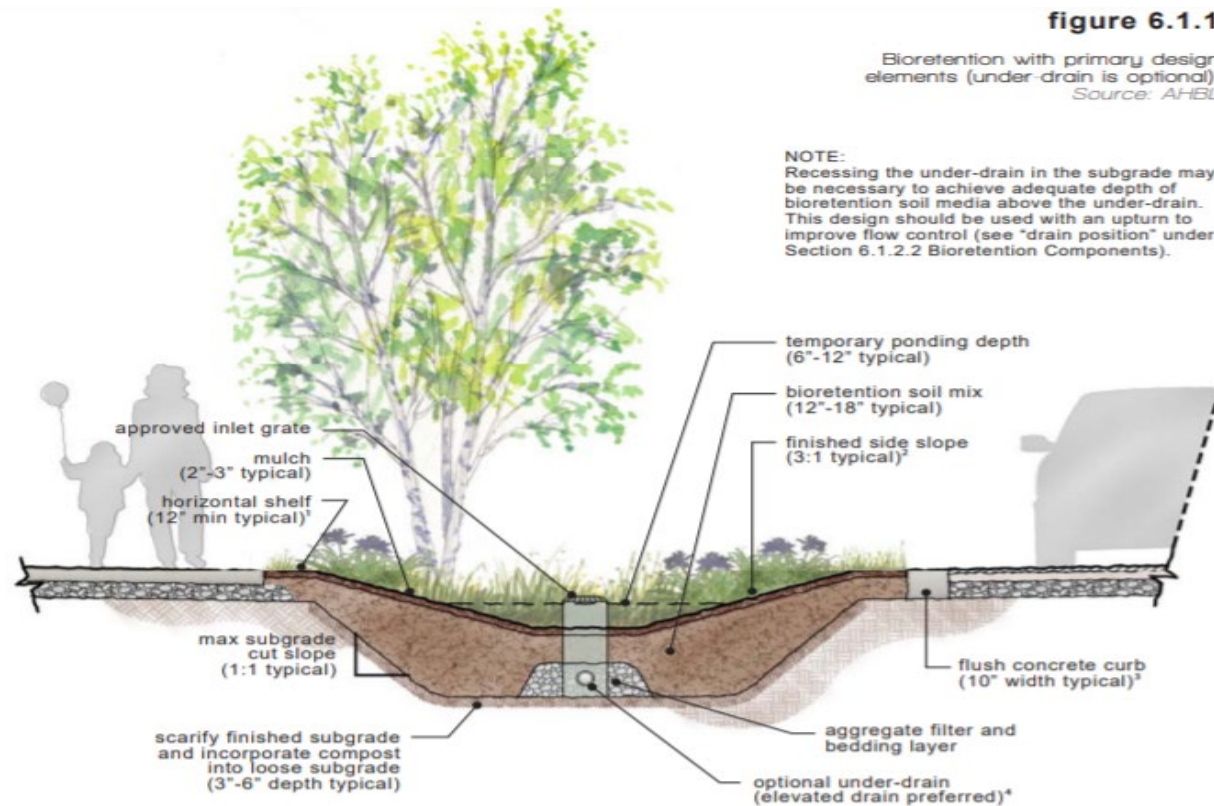


Image Source: Hinman, Curtis et al, Low Impact Development Technical Guidance Manual for Puget Sound, 2012

Tools In Our Toolbox



Image Source: Pixabay



PE Phase Schedule

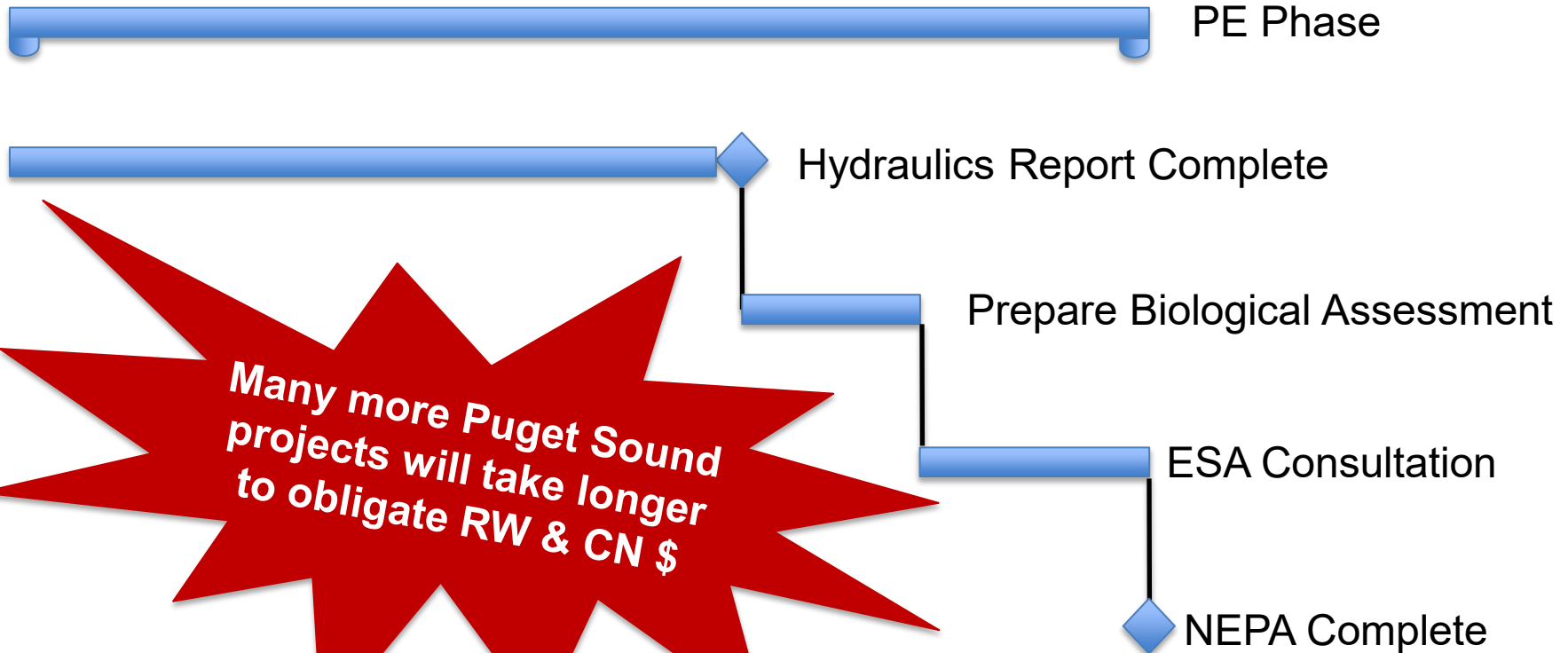
*** **CONCEPT** ***

Year 1

Year 2

Year 3

Year 4





What's on the Horizon?

WSDOT, NMFS, & FHWA established a technical working group to figure out a path forward.



Likely 2 tracks will result:

1. Interim for projects currently in the pipeline
2. Programmatic approach

Questions?



Melanie Vance

WSDOT Local Programs Environmental Manager

vancem@wsdot.wa.gov