

# Clarks Creek Dissolved Oxygen & Sediment TMDL



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June 10, 2014

# Public Comment Period

**We need your input!**

TMDL available at:

<http://www.ecy.wa.gov/programs/wq/tmdl/ClarksCrTMDL.html>

Send comments or questions by **July 21** to:

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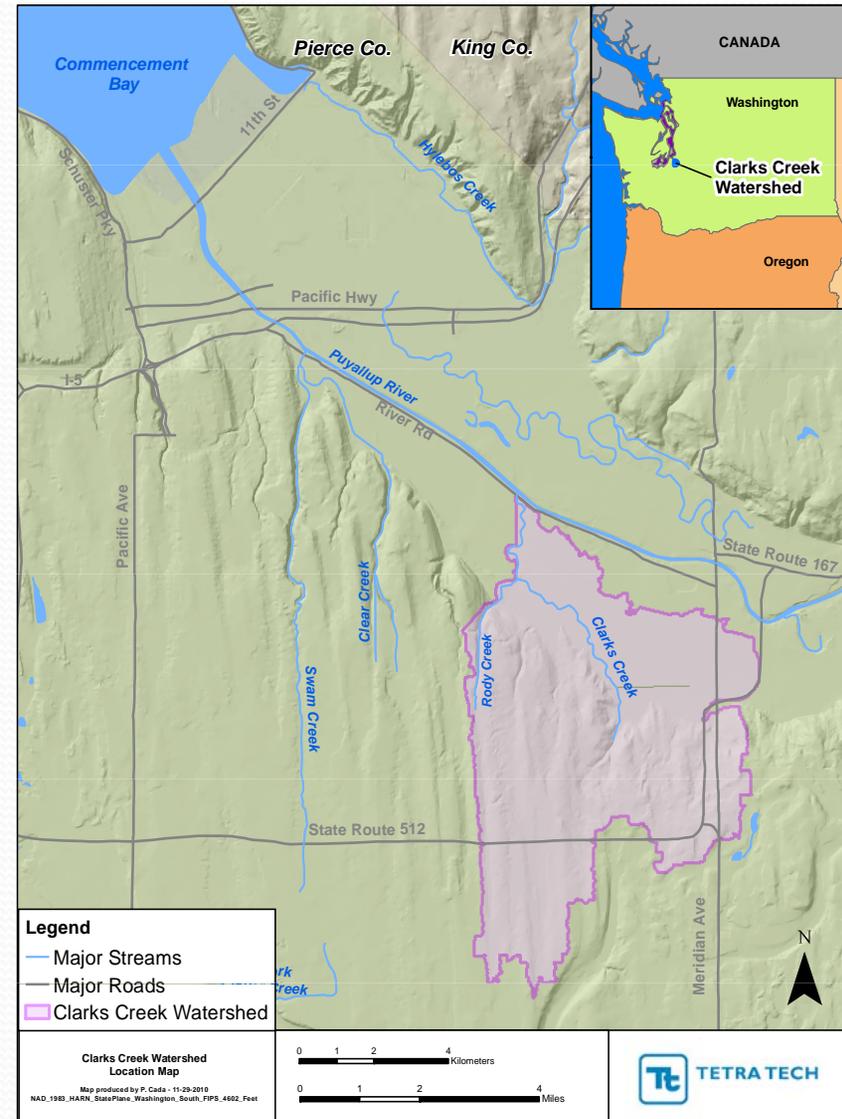


# Clean Water Act and TMDLs

- Federal Clean Water Act Created in 1972
- Goal: Waters will be fishable and swimmable
- Requires states to monitor and assess polluted waters
- Waters not meeting state standards are then placed on the 303(d) list
- EPA requires the state to develop TMDLs (Water Cleanup plan) on 303(d) listed waterbodies
- Cleanup plans provide a framework to improve water quality. They identify pollutant reduction goals needed to meet water quality standards.

# Clarks Creek

- 13-mile tributary to Puyallup River
- Rural/urban land uses with 5 species of salmon
- Puyallup Tribe lands, state waters, EPA contract
- Two municipal stormwater permittees, three hatcheries, WSDOT



# Clarks Creek Dissolved Oxygen and Sediment TMDL

- Clarks Creek was included on Ecology's 303(d) List for fecal coliform, pH and DO. Also impaired by sediment.
- What do we want to accomplish?
  - Protecting and restoring Clarks Creek



# What are the water quality problems in Clarks Creek?

- Low dissolved oxygen
  - Fish and other aquatic life need dissolved oxygen
  - Caused by excess elodea, lack of riparian shading, stormwater, and other factors
  - 303(d) List for dissolved oxygen



# What are the water quality problems in Clarks Creek?

- Excess sediment
  - Directly and indirectly impacts aquatic life
  - Caused by upland erosion and bank erosion
  - Impaired, but unlisted for sediment



# Clarks Creek Dissolved Oxygen and Sediment TMDL

- Clarks Creek Initiative TMDL – Kickoff  
May 2010
  - Involve affected parties
  - Understand problems in Clarks Creek
  - Develop specific targets that were meaningful to implementors
  - Give information that will make projects easier to fund
  - Increase collaboration and relationships in watershed to restore and protect Clarks Creek



# Clarks Creek Dissolved Oxygen and Sediment TMDL

- Data collection, analysis, and modeling: 2010 – 2013
- TMDL open for public comment May 22 – July 21, 2014.

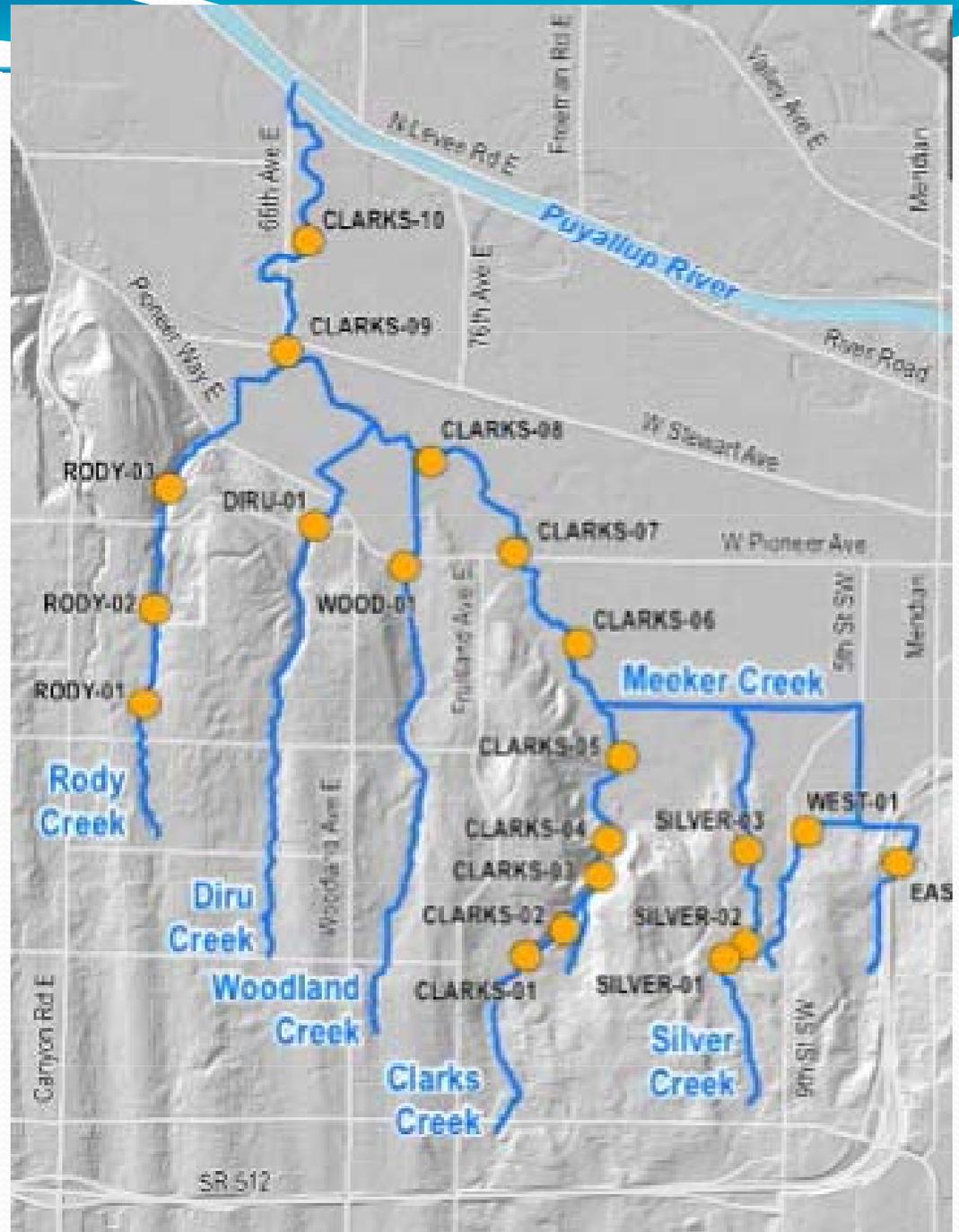


# TMDL Data and Modeling

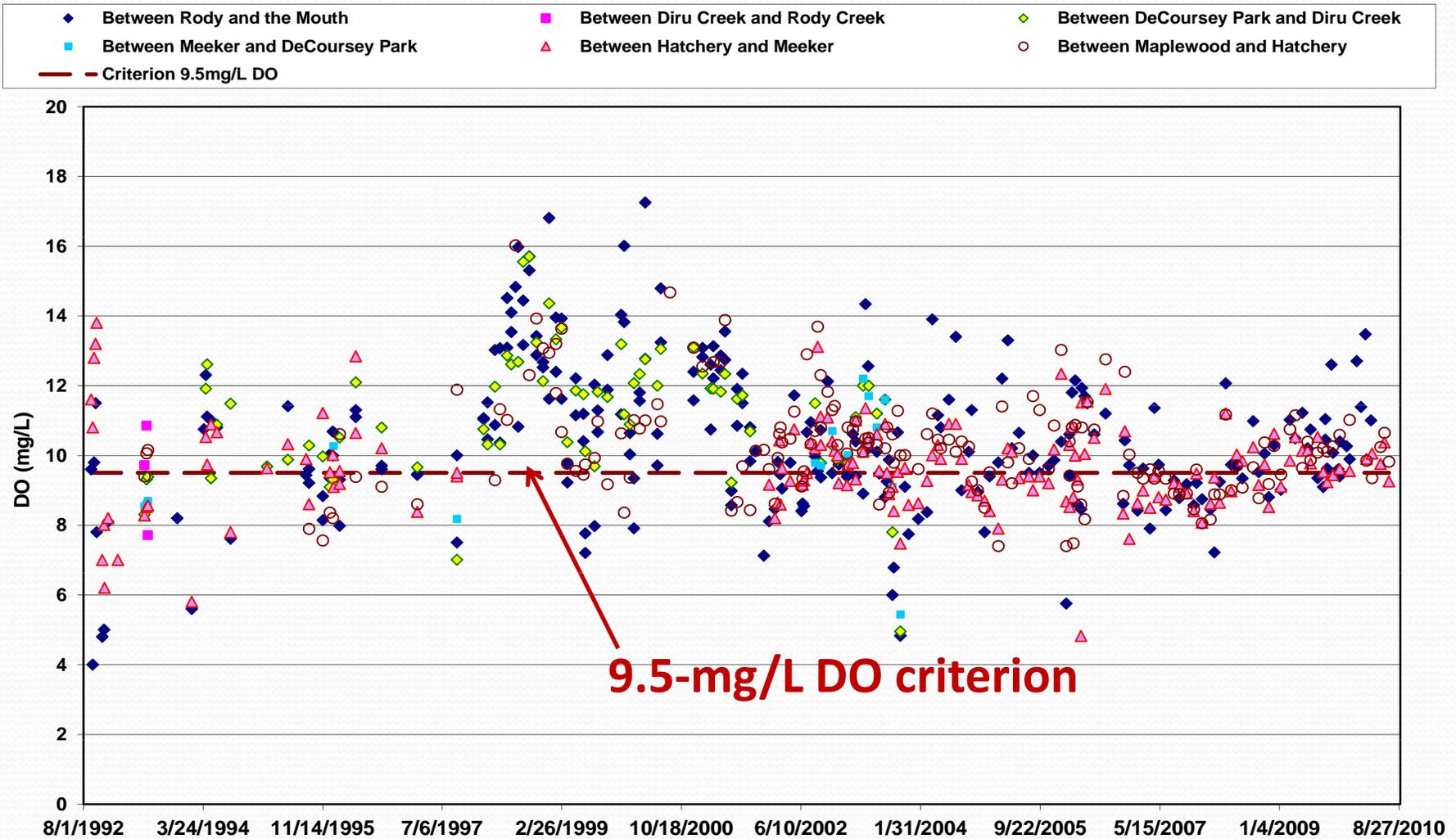
- Ecology, EPA, Puyallup Tribe, contractors, and other partners collected information on water quality, habitat, sediment, and macroinvertebrate data over multiple decades.
- We developed a computer model to investigate pollution impacts.



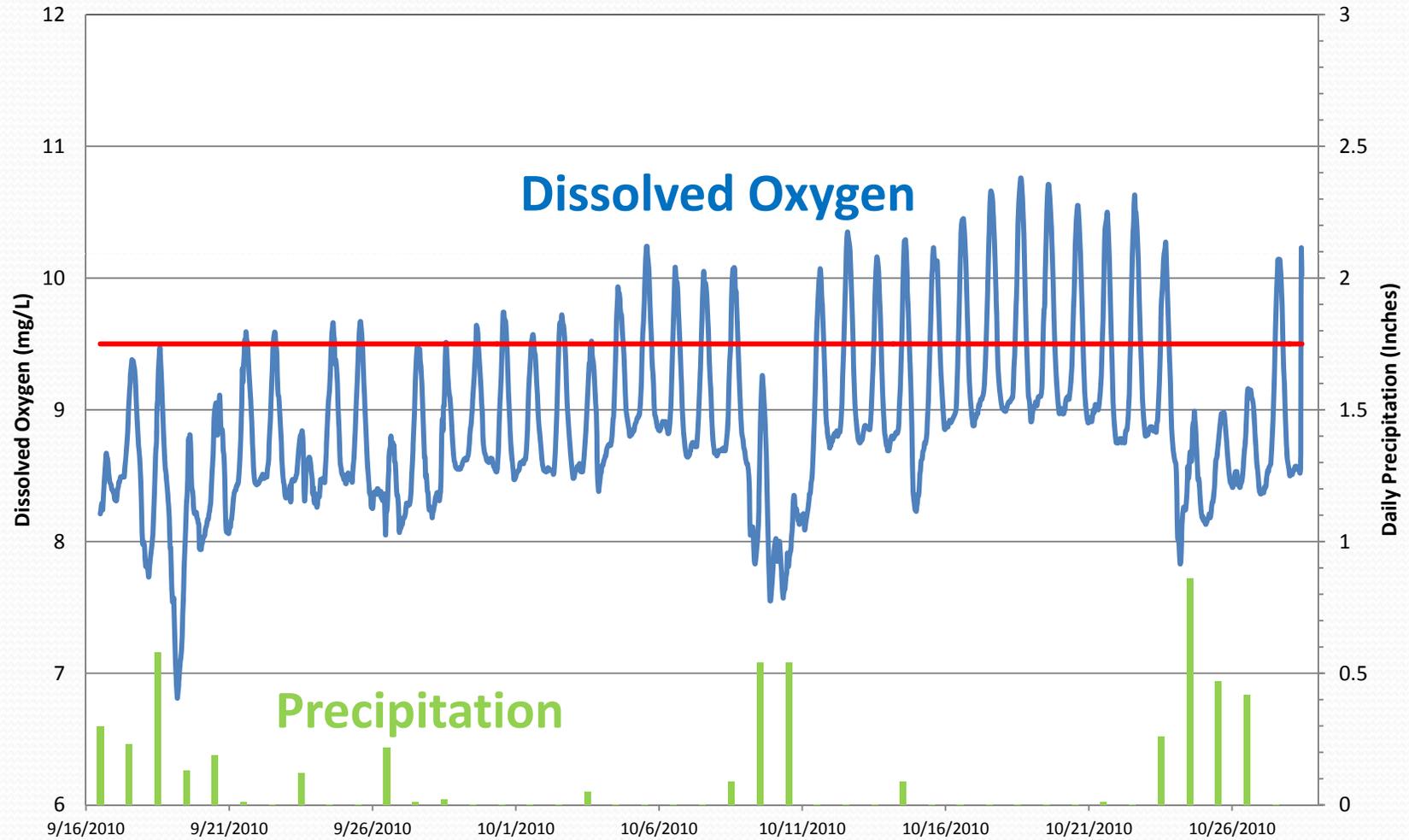
# Example: Sediment Monitoring Locations



# Dissolved Oxygen Record

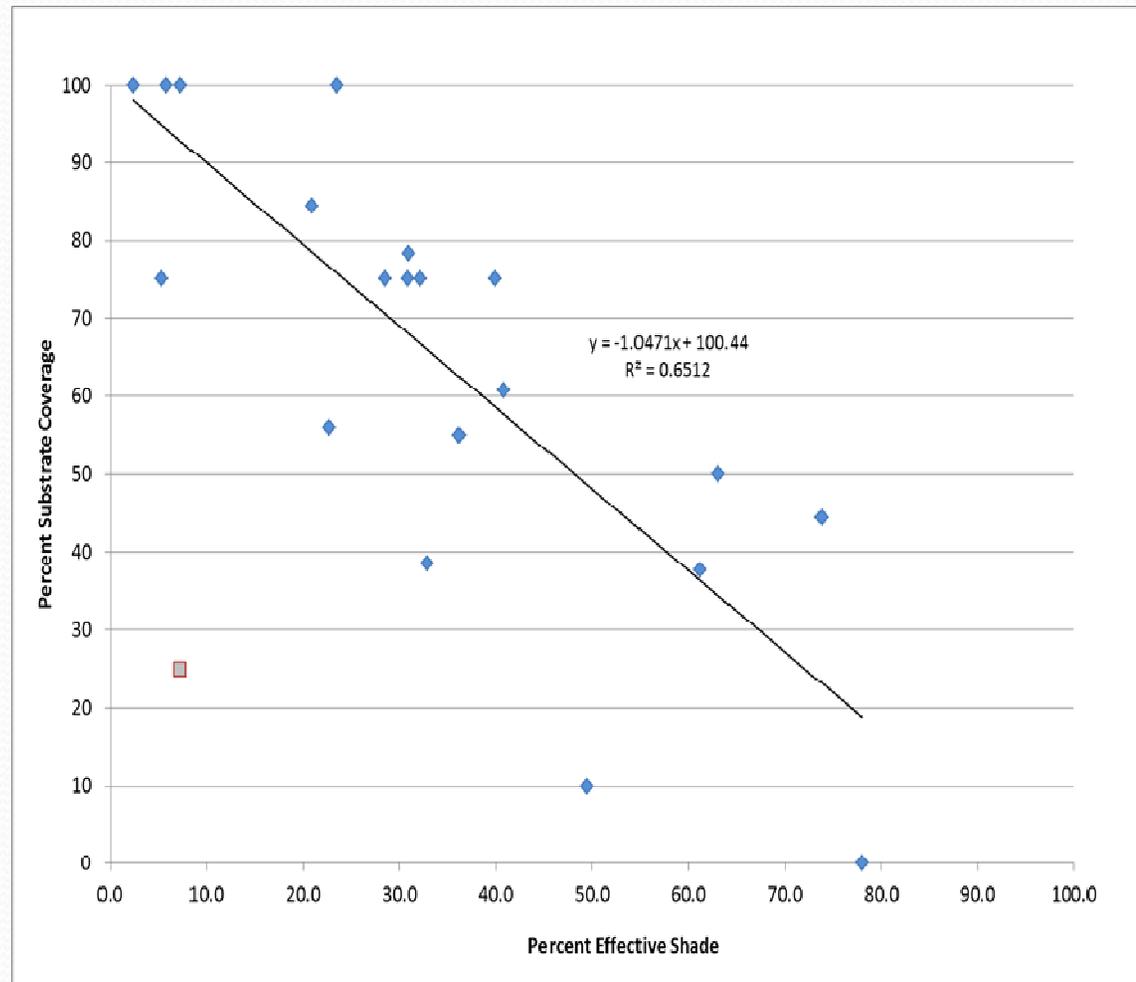


# DO and Precipitation

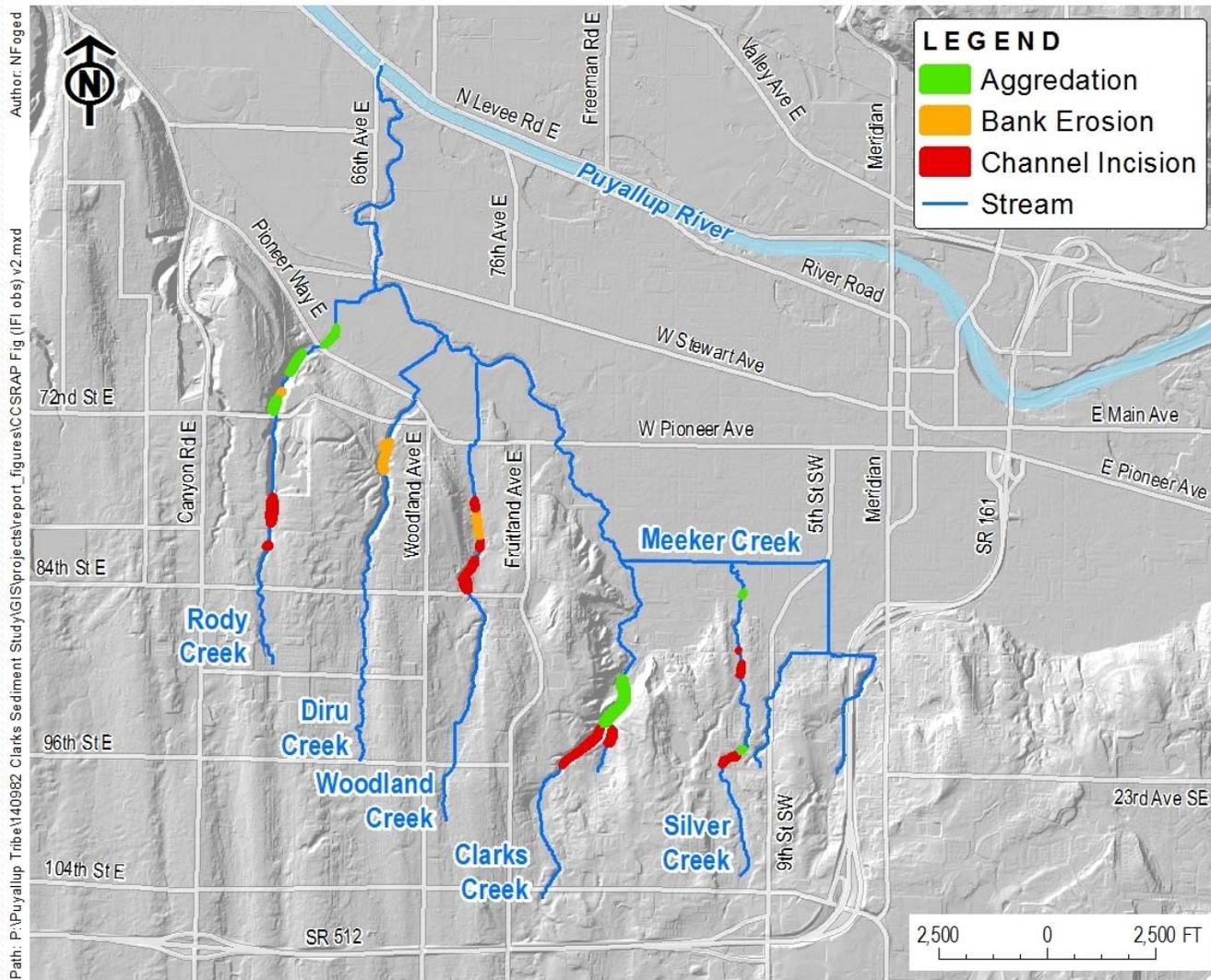


# Riparian Shade and Elodea Density

85%  
Effective  
Shade will  
“Shade Out”  
Elodea



# Sediment

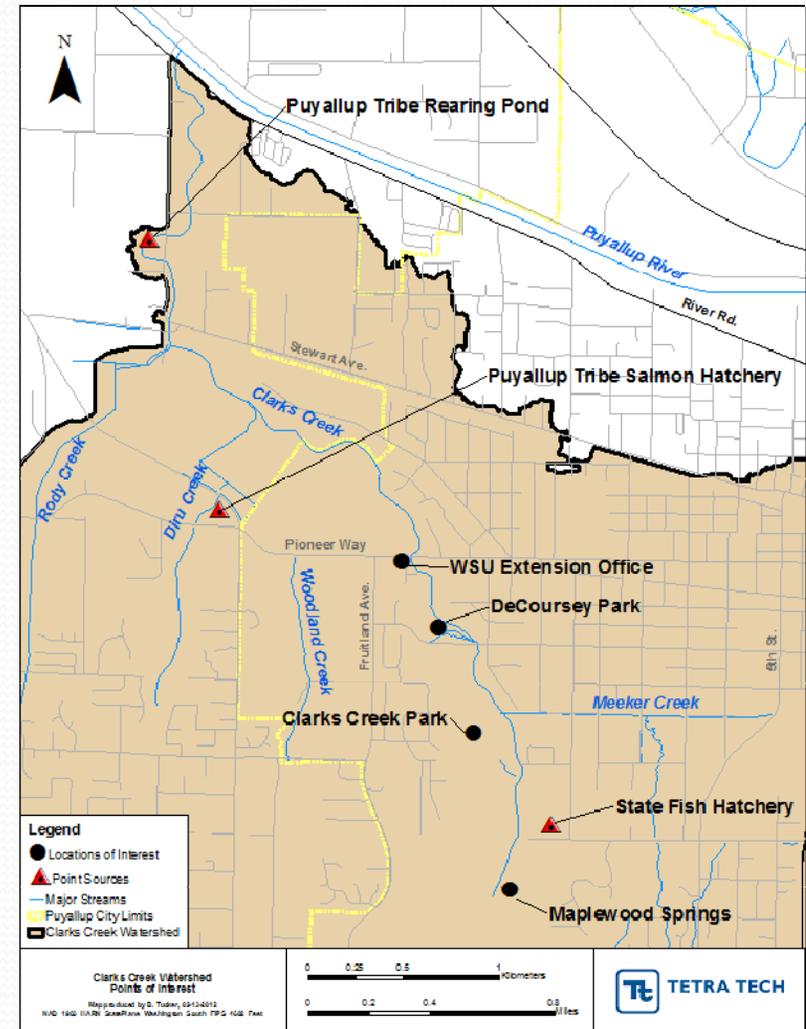


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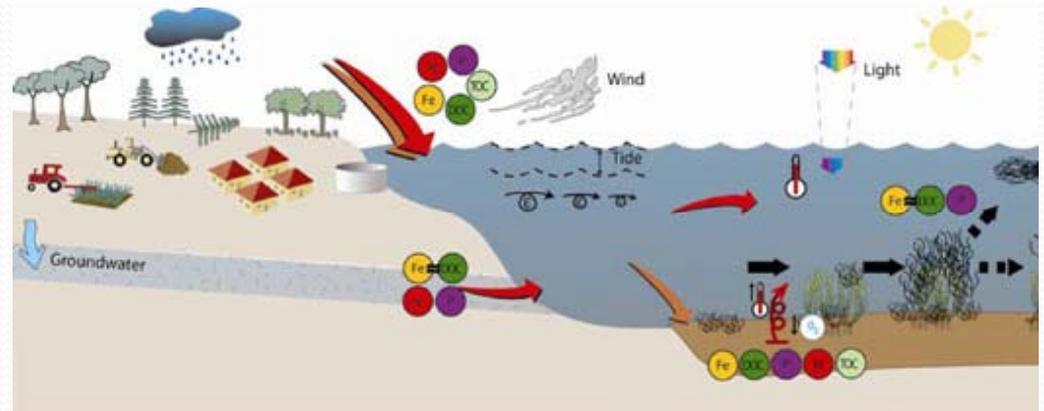
# Key Pollution Sources

- POINT
  - Stormwater
    - Municipal, Construction & Industrial
  - Fish Hatcheries
- NON-POINT
  - Stormwater Runoff
  - Lack of Riparian Cover
  - Erosion/Incision/Sedimentation
  - Elodea



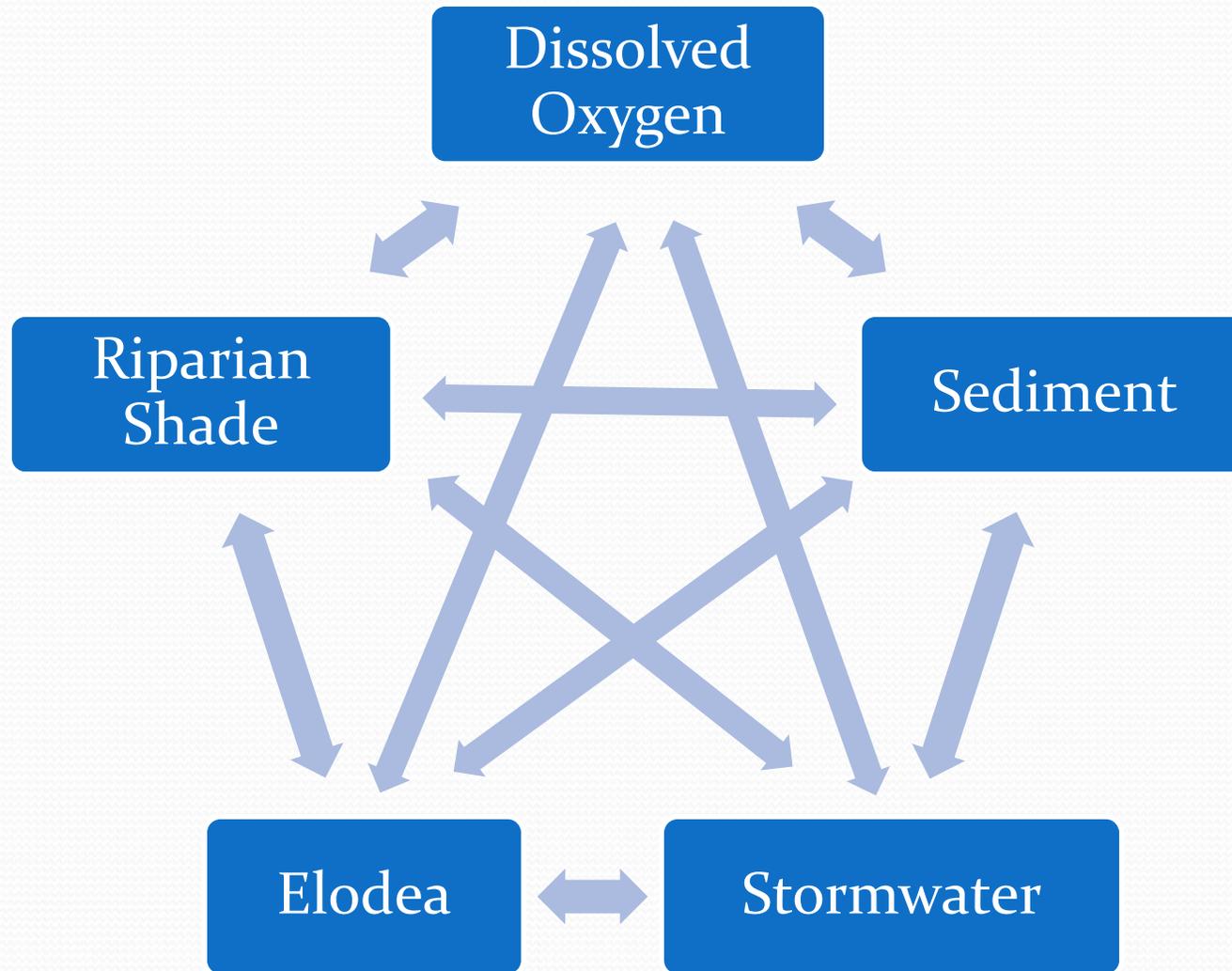
# Water Quality Model

- Determine what Clarks Creek DO is sensitive to:
  - Stormflows
  - Riparian shading
  - Elodea removal
  - Decreased SOD
  - Increased nutrients
  - Groundwater flow withdrawals
- Calculate pollutant loads to meet DO TMDL.



# Conclusions

## Water Quality Problems are Interrelated



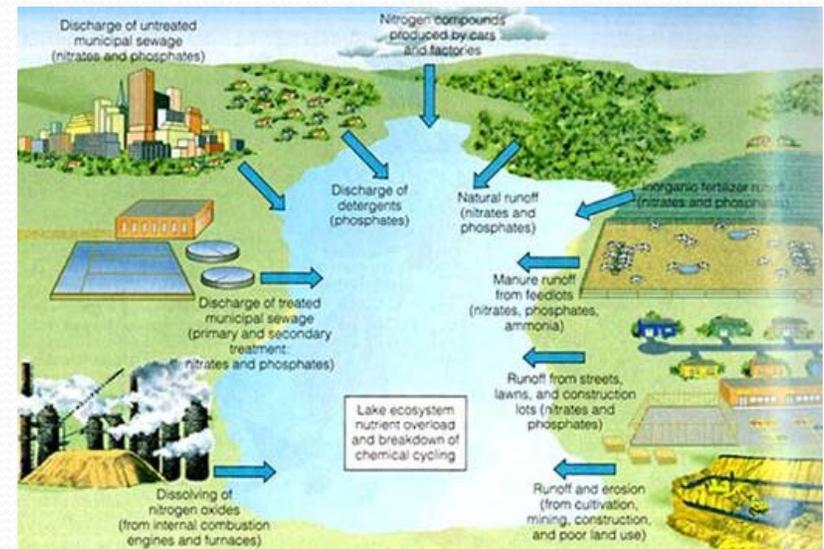


# Conclusions on Sediment

- Significant excess sediment enters Clarks Creek each year
  - In-stream channel stability and bank erosion
  - Sediment and erosion in upland areas from stormwater runoff
- Leads to DO Impacts
  - Provides ideal substrate for elodea growth
  - Interactions between fine sediment and water

# Conclusions on Dissolved Oxygen

- The biggest sources of DO problems are elodea, stormwater, and sediment.
- A variety of stormwater treatment and reduction projects can improve DO levels significantly.
- Increased riparian shade will improve bacteria, DO, sediment, and decrease elodea density.

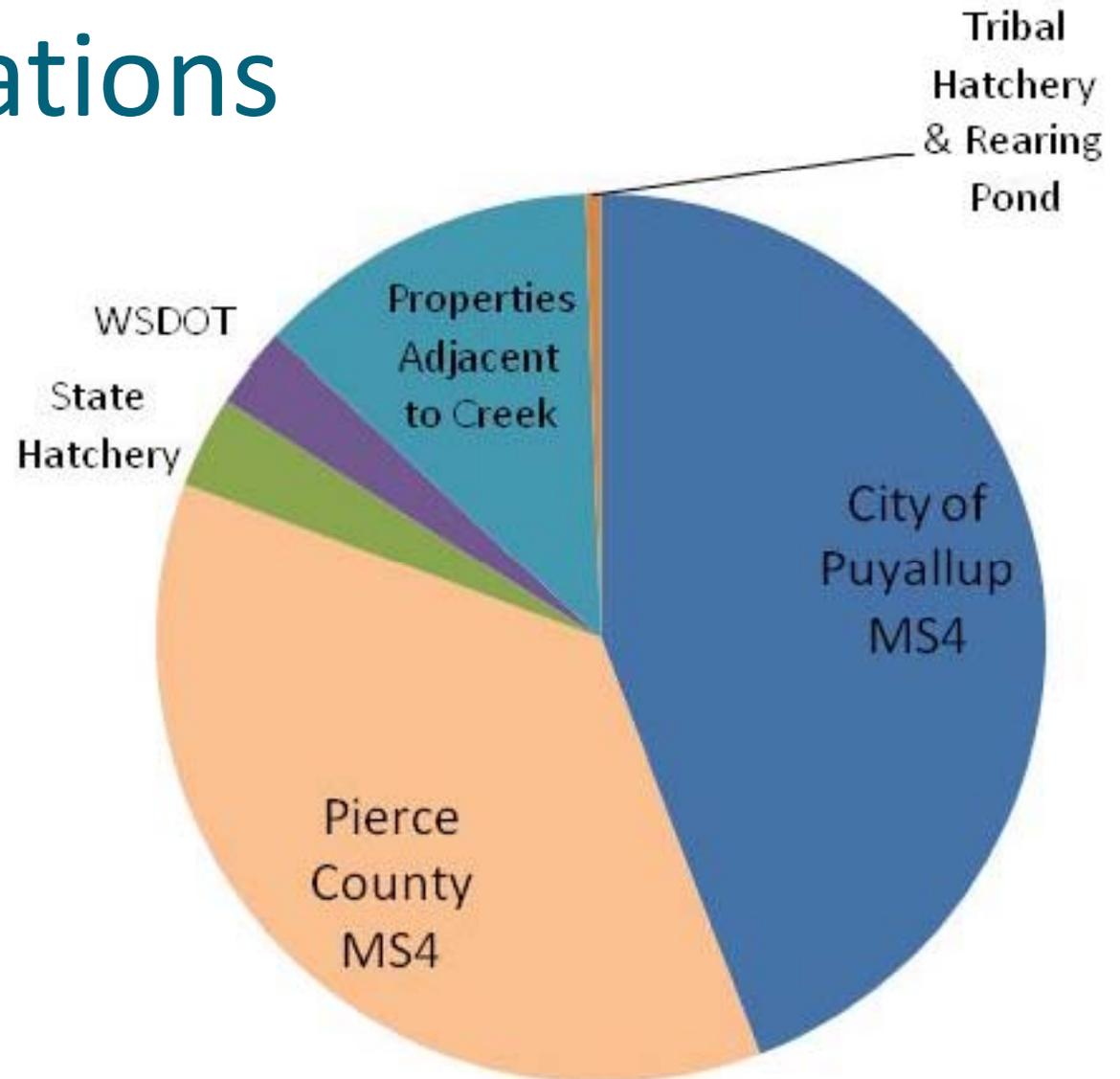


# TMDL Allocations

1: Dissolved

Oxygen:  
86% reduction  
needed

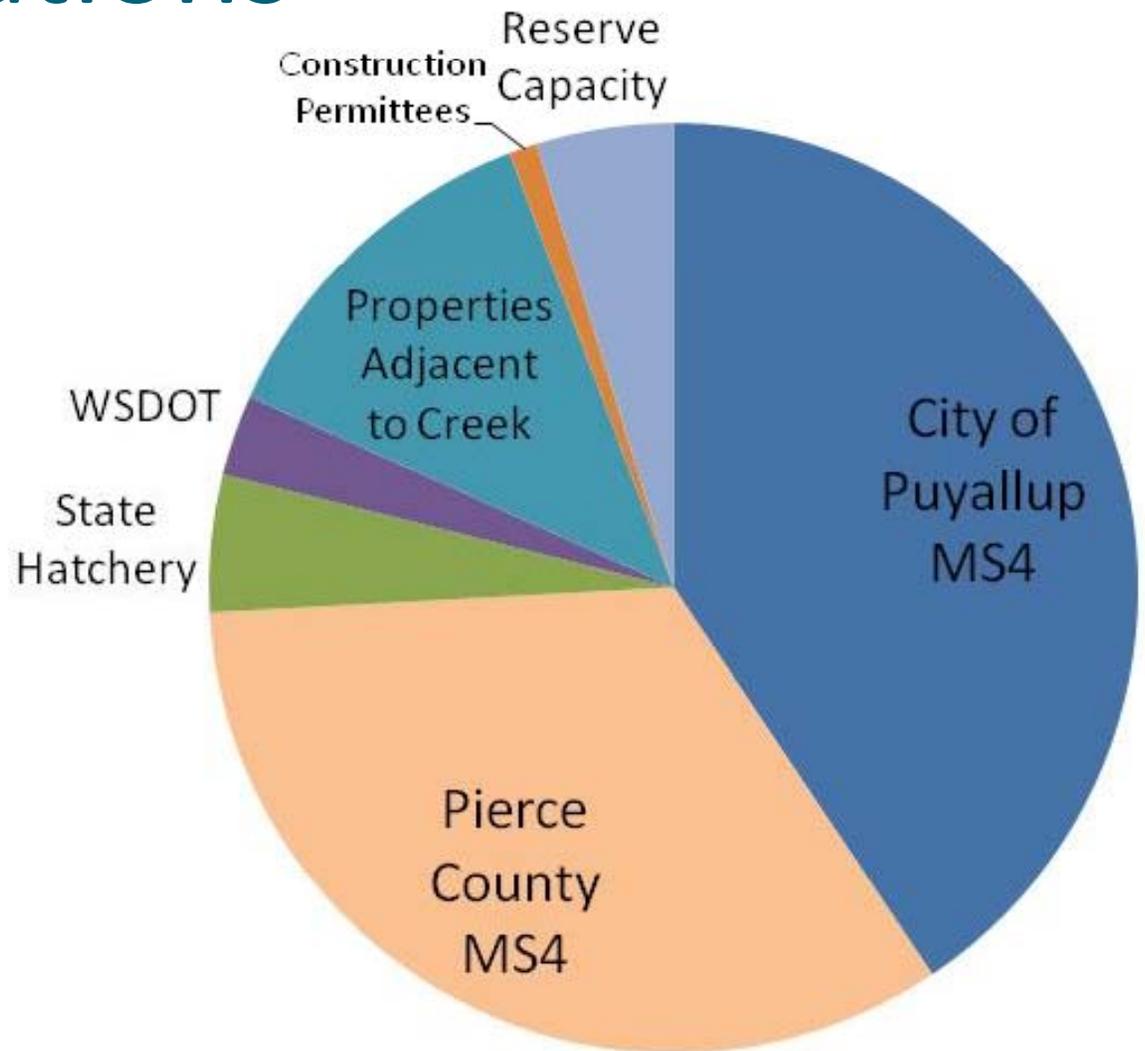
Reduce from  
5,189 to 719  
kilograms/day



# TMDL Allocations

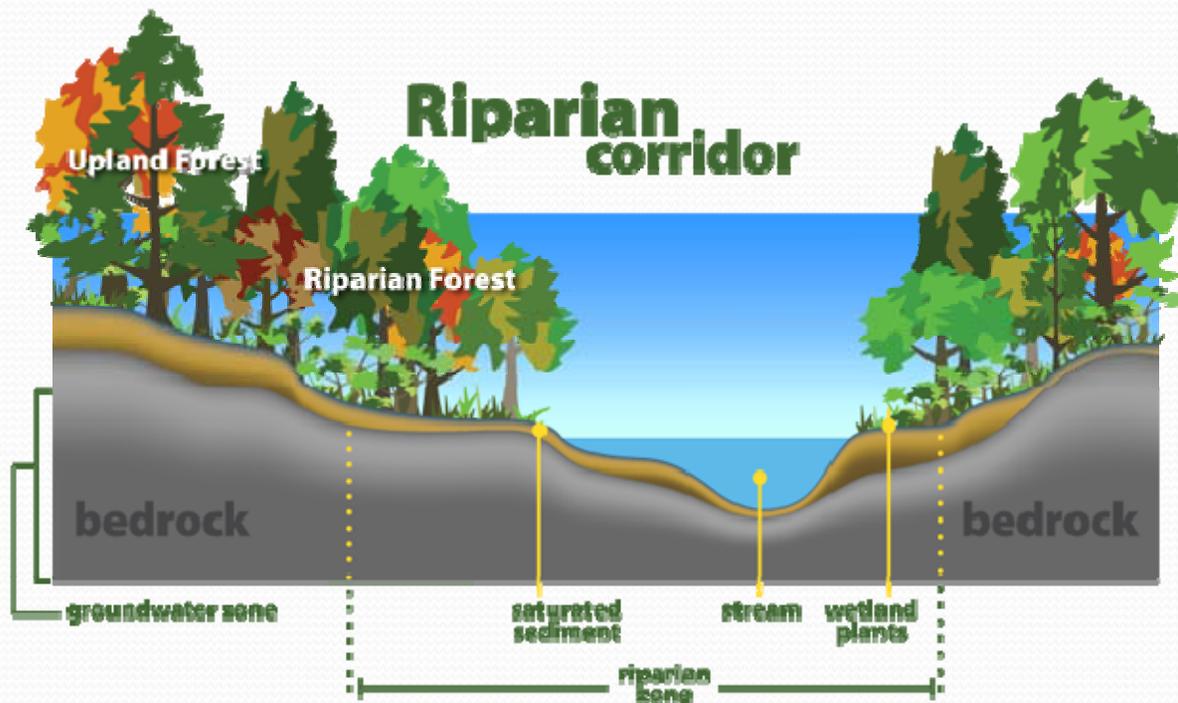
2: Sediment: 66%  
reduction needed

Reduce sediment  
from 1.57 to 0.57  
tons/day



# TMDL Allocations

3: Additional targets for elodea density and riparian shade



# TMDL Implementation



- Pierce County and City of Puyallup submit a plan to Ecology to:
  - Meet DO reduction or reduce/treat stormwater by 50%
  - Reduce sediment levels by 66%
- WSDOT: Inventory stormwater facilities to identify deficiencies, find illicit discharges, and address deficiencies by prioritizing retrofits.

# TMDL Implementation



- State Hatchery: Meet TMDL limits in permit
- Tribal Hatcheries: Monitor outfalls for flow, nutrients, and solids and Implement Best Management Practices to reduce solids and nutrients discharged into Clarks Creek and tributaries

# TMDL Implementation

- Education/Outreach and Technical Assistance
  - WSU – Puyallup
  - Pierce Conservation District
  - Tacoma Pierce Health Department
- Shade and Elodea – How landowners Can help
  - Work with City of Puyallup and Pierce County to restore riparian plants along creek

# Reduction or Treatment Credits from Proposed Projects

The following projects would meet 70-90% of the target reductions for the City of Puyallup, Pierce County, and WSDOT:

59th Ave R1

59th Ave R2

Woodland Cr Pond W3

72nd St. E

Rody Pond

15th St. Diversion

Hatchery Pond

Ravine Stabilization

Meeker Channel

Riparian Planting

End-of-pipe retrofits

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# Questions ?

