



DO TMDL Advisory
Committee Meeting

May 20, 2015

2014 Lake Spokane Monitoring and Implementation Activities

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Longitudinal Structure

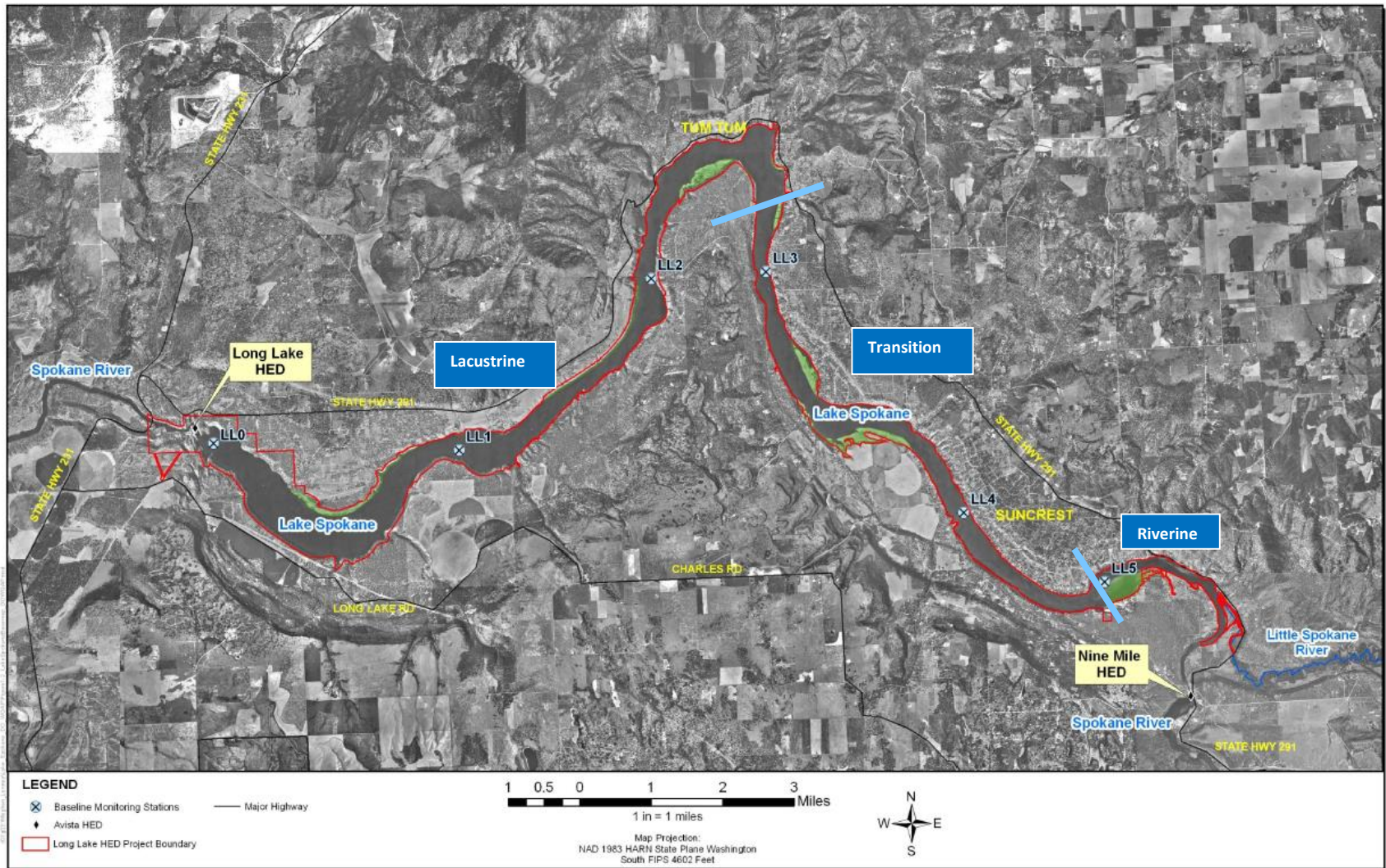
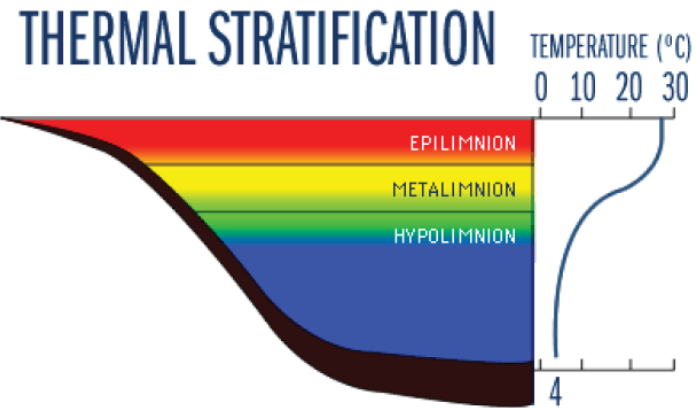
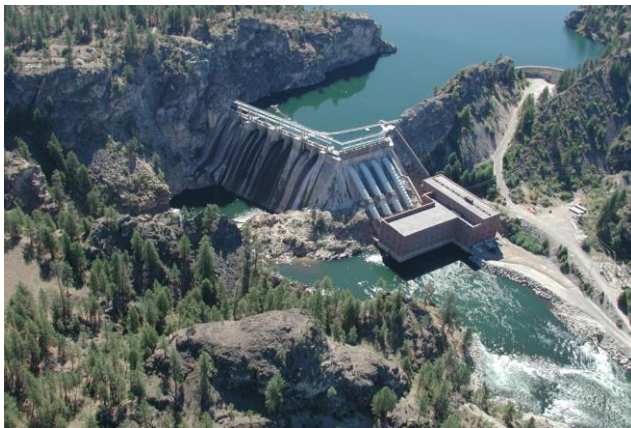
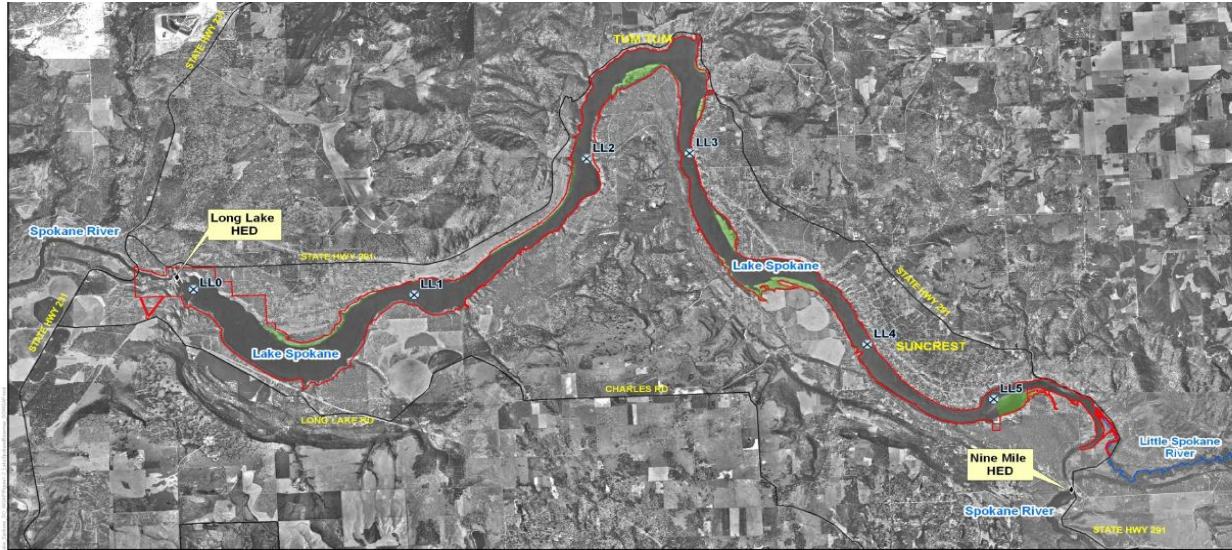


Figure 1. Lake Spokane Baseline Monitoring Stations

Vertical Structure



Discrete Depth Sampling Stations

Lake Spokane Sampling Station and Discrete Depth						
	LL0	LL1	LL2	LL3	LL4	LL5
Dep ths	0.5	0.5	0.5	0.5	0.5	0.5
	5	5	5	5	4	B-1
	15	20	15	10	B-1	
	30	B-1	B-1	B-1		
	B-1					

2014 Sample Dates:

- May 14-15
- June 10-11
- June 24-25
- July 8-9
- July 23-24
- August 5-6
- August 20-21
- Sept. 9-10
- Sept. 24-25
- October 14-15

At each depth samples were analyzed for:

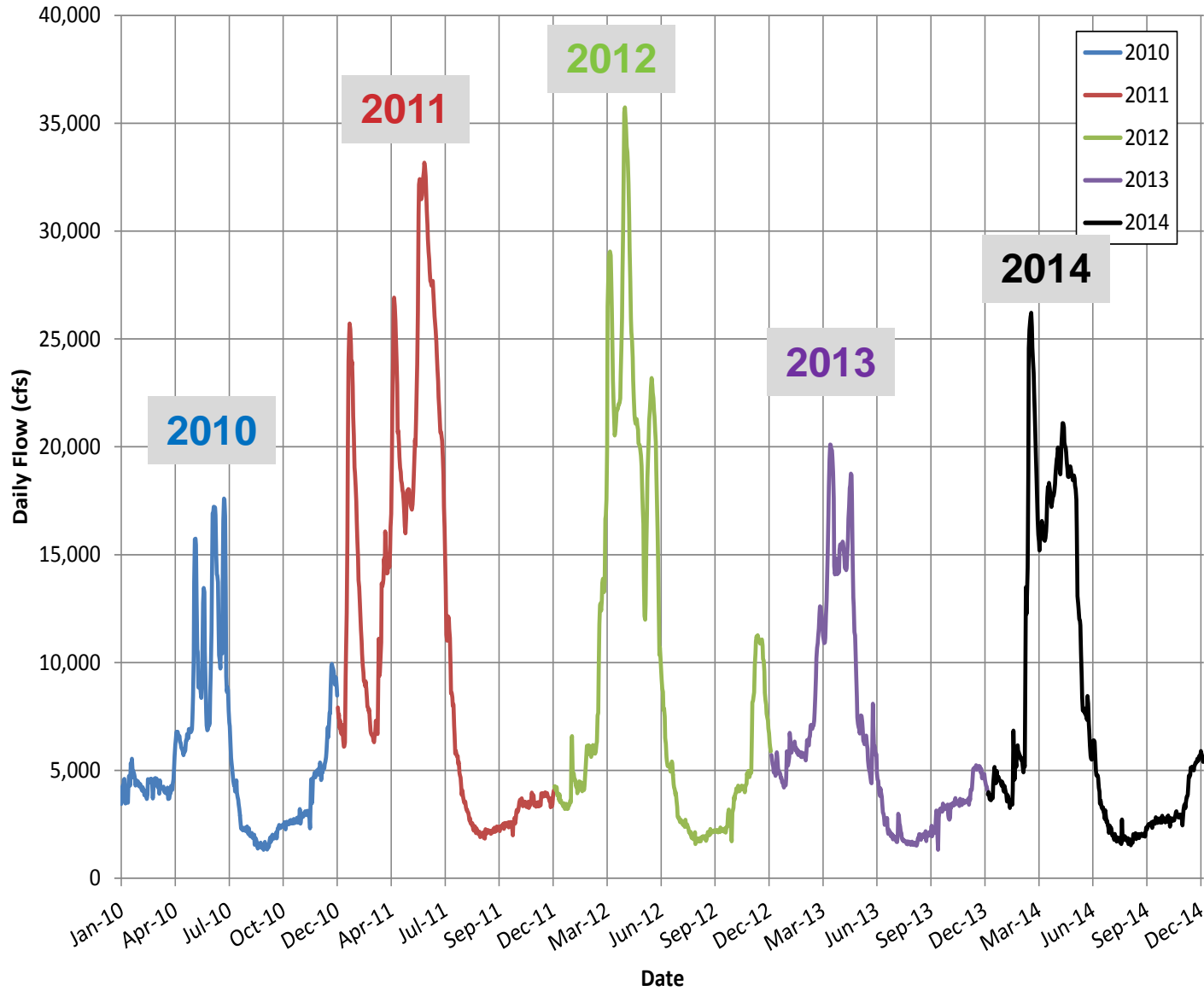
- Nitrate plus nitrite
- Total persulfate nitrogen (TN)
- Soluble reactive phosphorus (SRP)
- Total phosphorus (TP)
- Chlorophyll a (chl)

At each station profiles were completed of:

- Water temperature
- Dissolved oxygen
- pH
- Conductivity

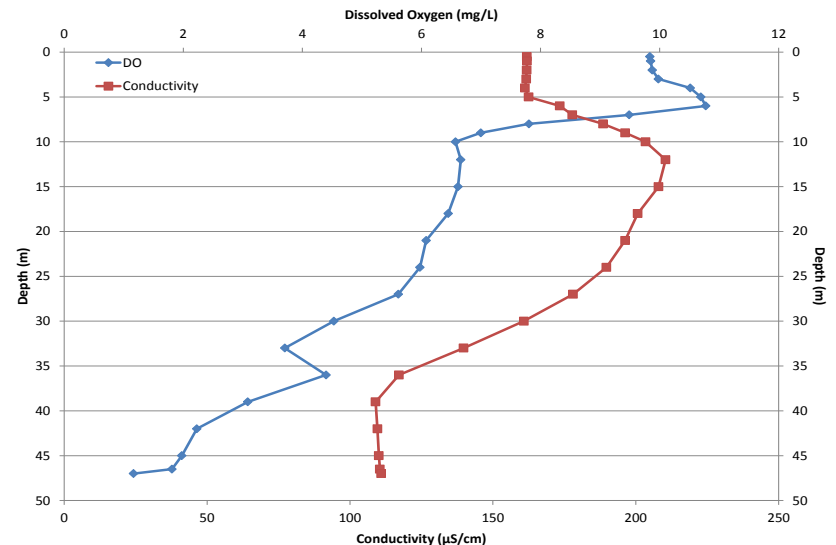
**Secchi Disc Depth, phytoplankton, and zooplankton also collected at each station

Lake Spokane Inflows 2010-2014



2014 Lake Spokane Monitoring

- Dissolved Oxygen
 - Max conc. ~12 to 14 mg/L
 - Ave conc. 8.3 to 10.3 mg/L
 - **Min conc. 0 mg/L**
 - July – Sept. volume weighted hypolimnetic ave. ranged from 8.5 to 6.0 mg/L



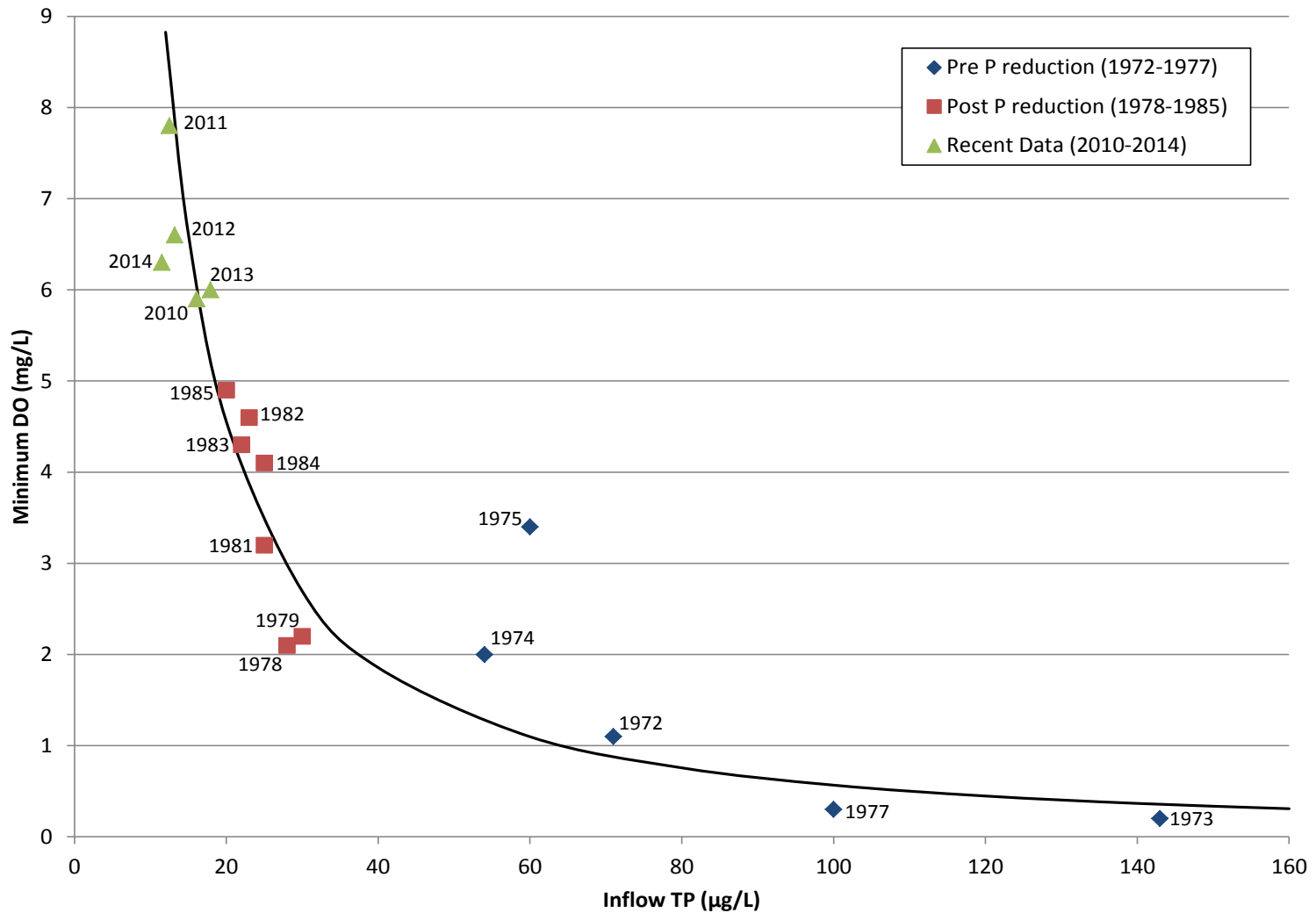
Ave. DO & Conductivity for LL0, LL1, LL2 (late July – Sept.)

- Total Phosphorus
 - Ranged from 4 to 70 µg/L
 - Volume weighted hypolimnetic TP conc. ave <35 µg/L
- Soluble Reactive Phosphorus
 - Ranged from non-detect (1.0 µg/L) to 61 µg/L

2014 Lake Spokane Monitoring

- Nitrogen
 - Ranged from 250 to 2,000 $\mu\text{g/L}$
 - Most of the TN consisted of nitrate + nitrite
- Chlorophyll-a
 - Ranged from 0.5 to 25.4 $\mu\text{g/L}$
 - Often highest at ~16 ft depth
- Transparency
 - Ranged from 1.6 to 7.7 m depth
- Zooplankton/Phytoplankton
 - diatoms and green algae greatest biovolume
 - substantial cyanobacteria biovolume at LL4 and LL5 in august

June – October Volume Weighted Mean Inflow TP Concentrations related to Volume Weighted Hypolimnetic DO Concentrations before and after advanced wastewater treatment.

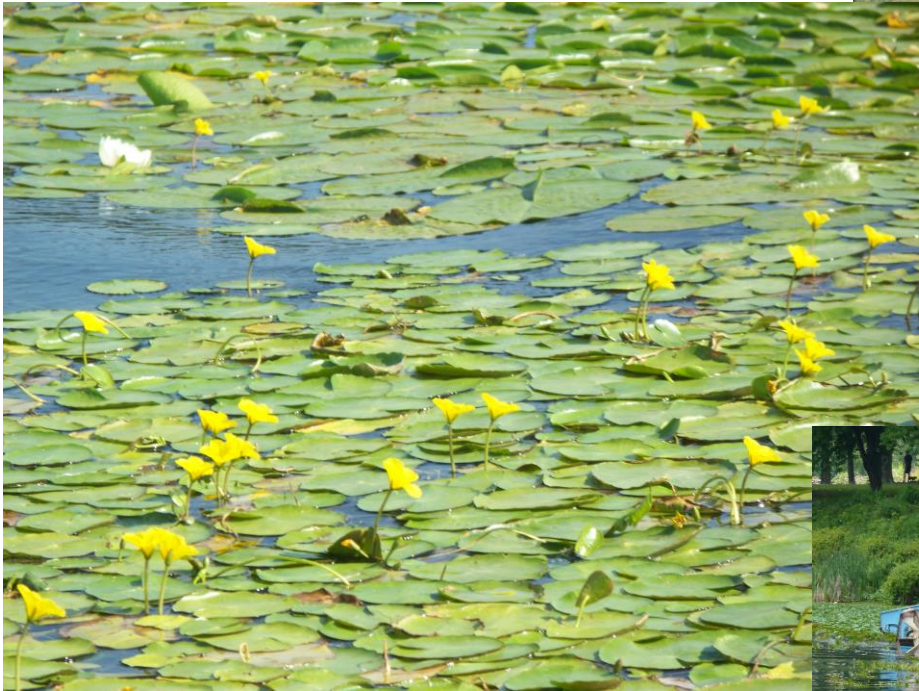
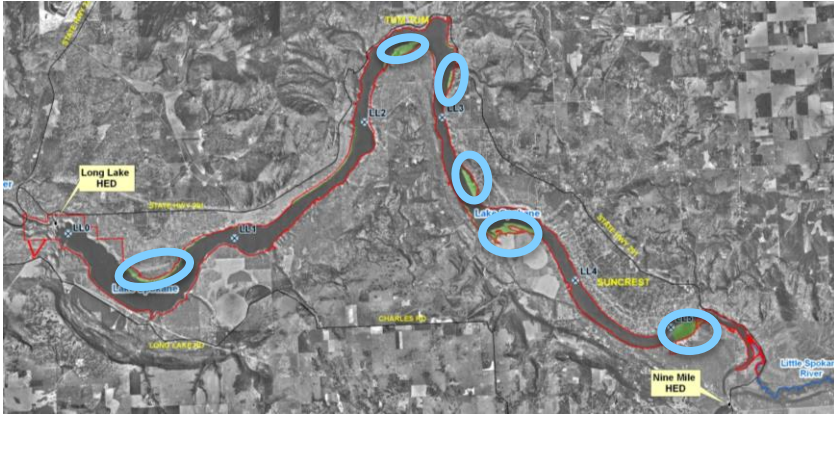


Source: TetraTech 2015 (Lake Spokane Annual Summary Report, 2014 Baseline Water Quality Monitoring Results)

DO WQAP Implementation

- Aquatic Weed Harvesting Analysis
- Carp Population Reduction Analysis
- Bulkhead Rmvl/Reducing lawn areas
- Grazing land lease
- Wetlands
- Planting trees

Harvesting Aquatic Weeds?

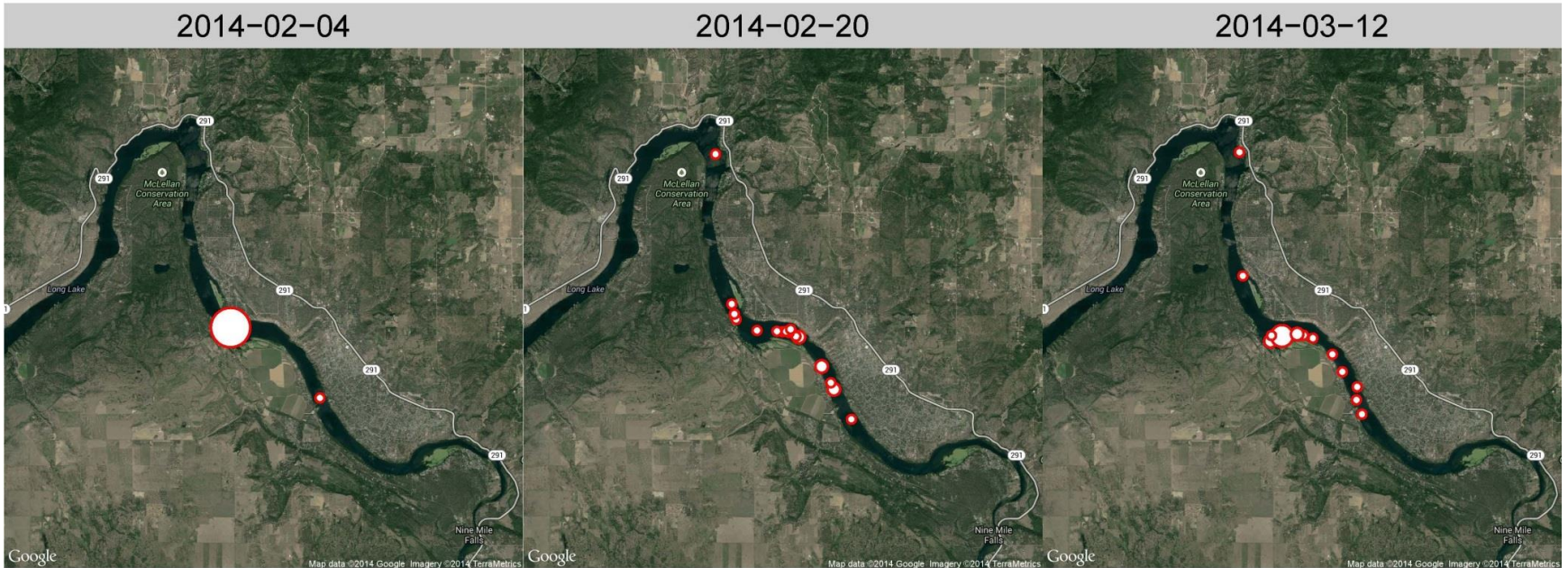


Lake Spokane Carp



Carp Population Reduction?

Number of fish ○ 1 ○ 5 ○ 10 ○ 15 ○ 20

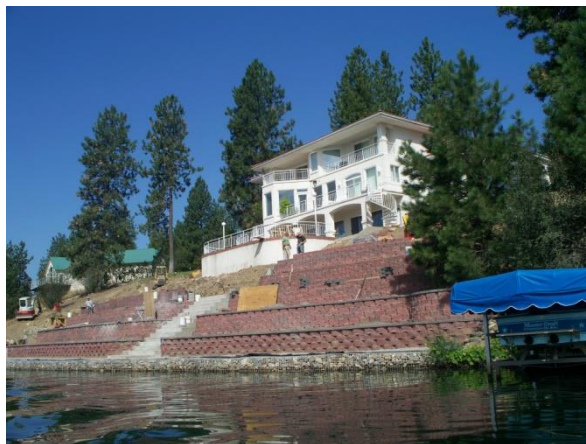


Map & Photo Source: Golder Associates

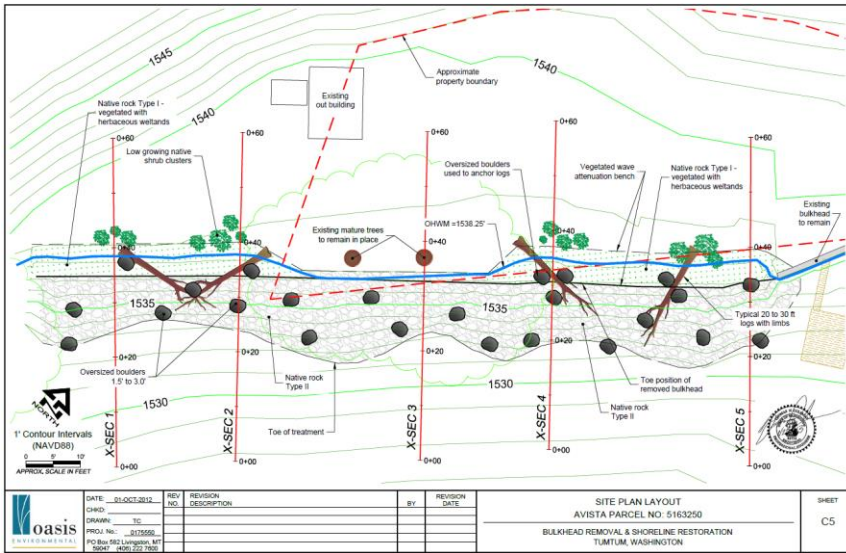
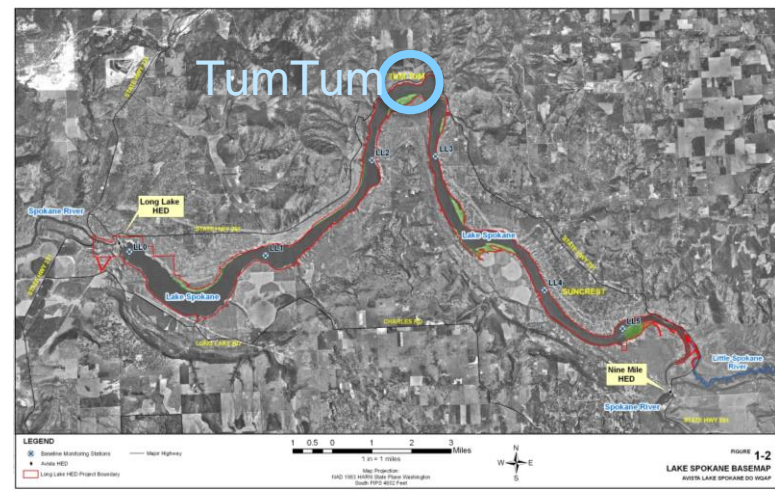


DO WQAP Implementation

- Aquatic Weed Harvesting Analysis
- Carp Population Reduction Analysis
- Bulkhead Rmvl/Reducing lawn areas
- Land Protection
- Planting trees
- Wetlands
- Education



Bulkhead Removal



DO WQAP Implementation

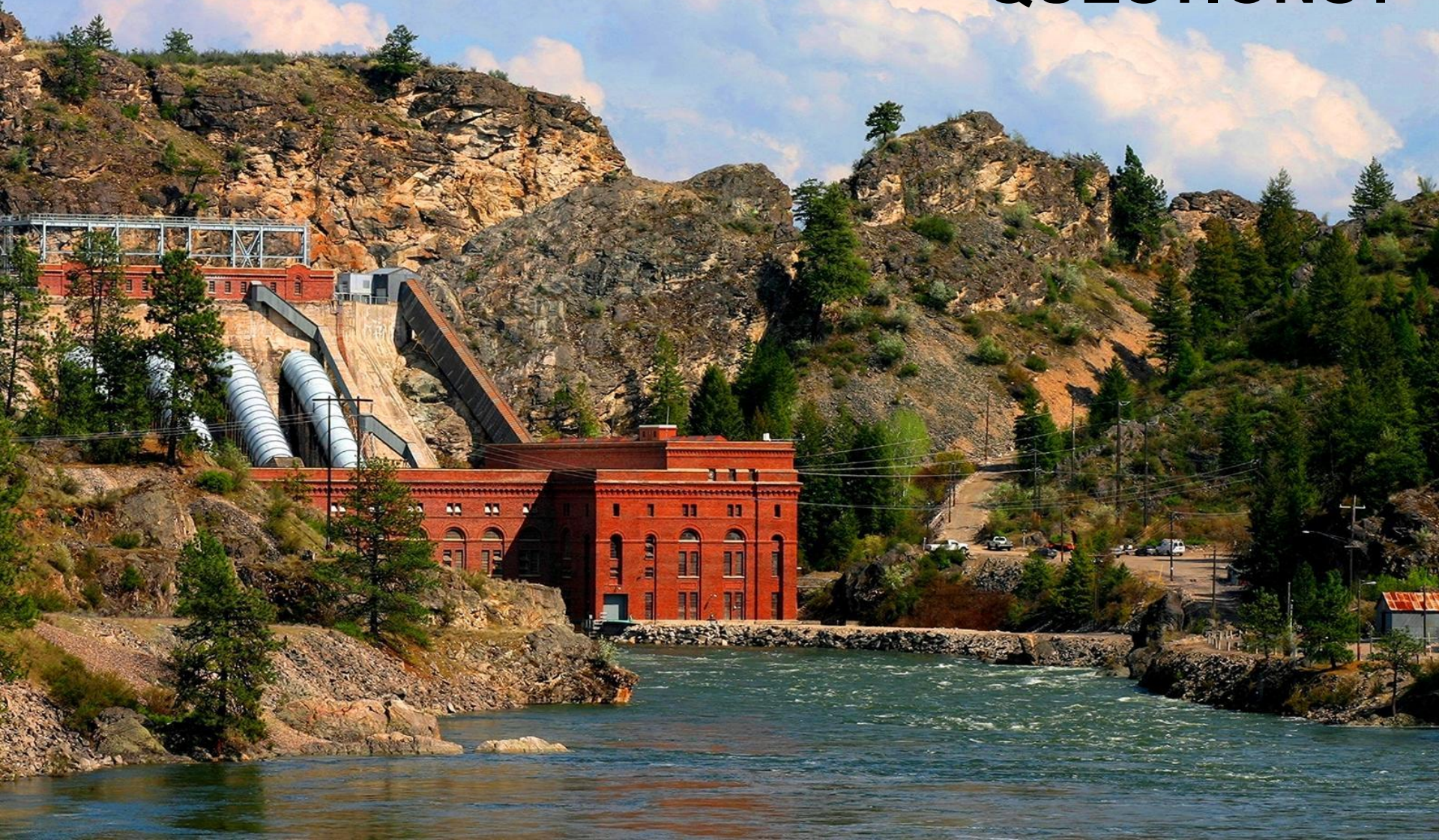
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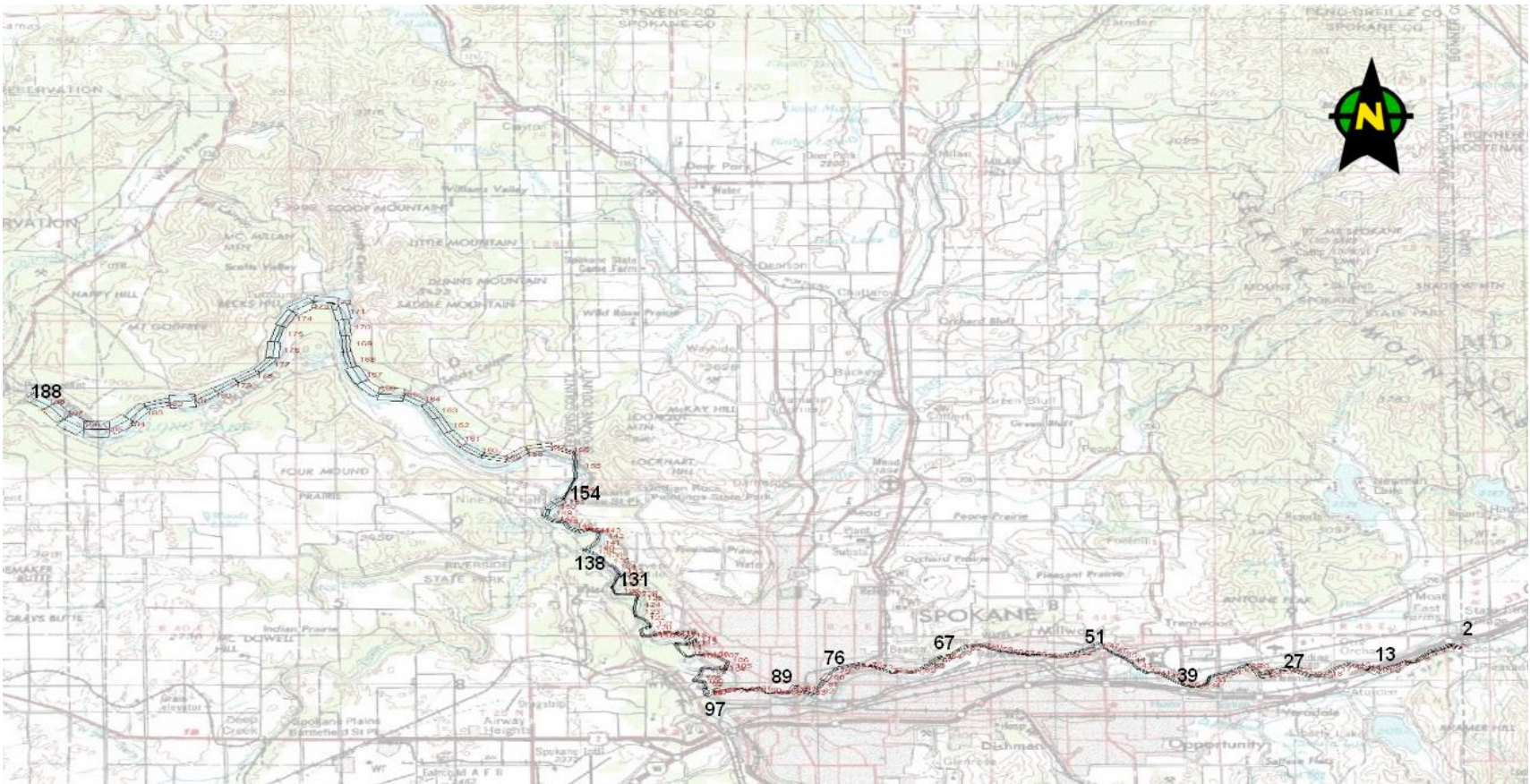


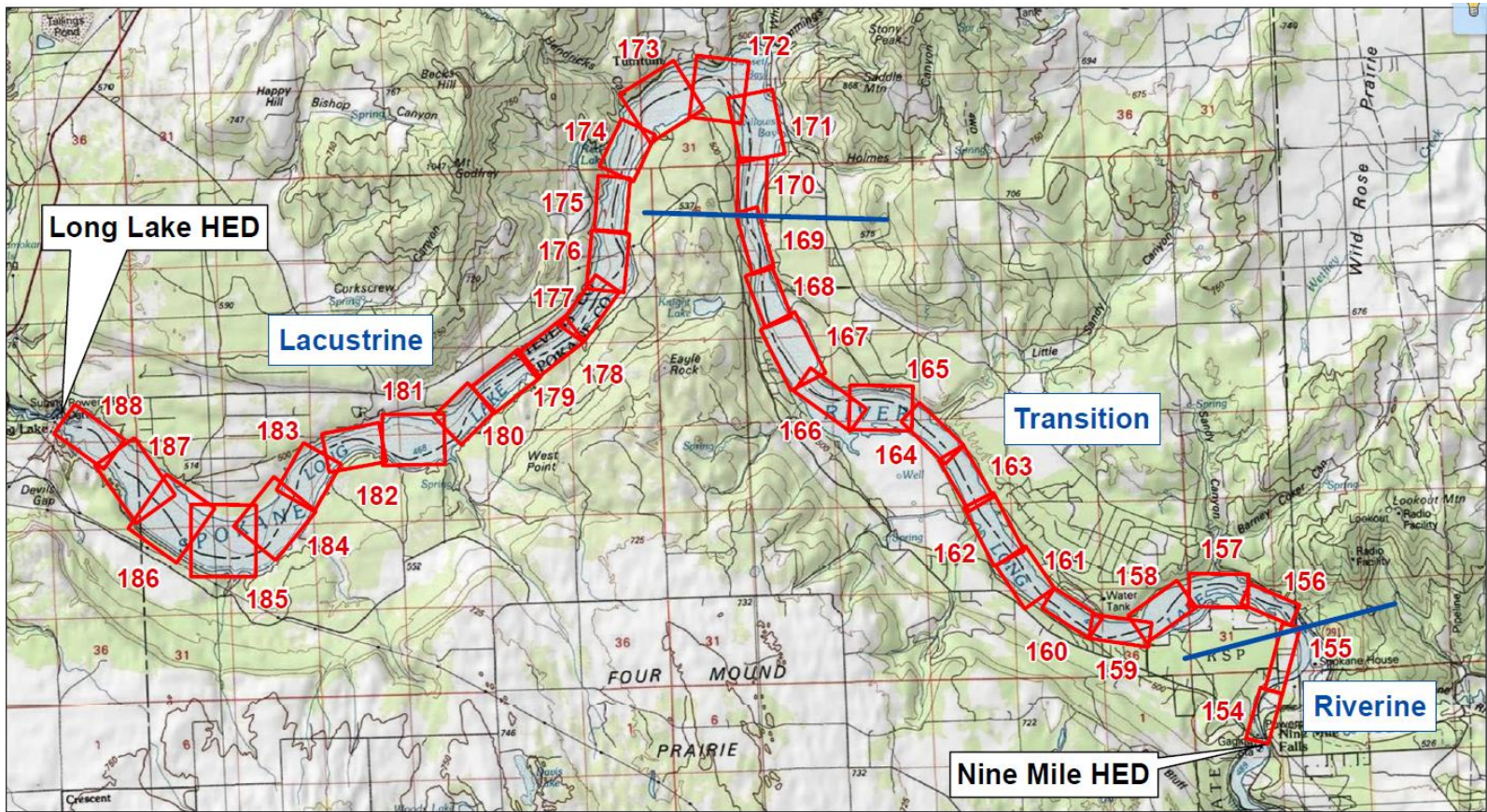
2013 Tree Planting



QUESTIONS?







Source: Figure 6-1, DO WQAP