Meghan Lunney

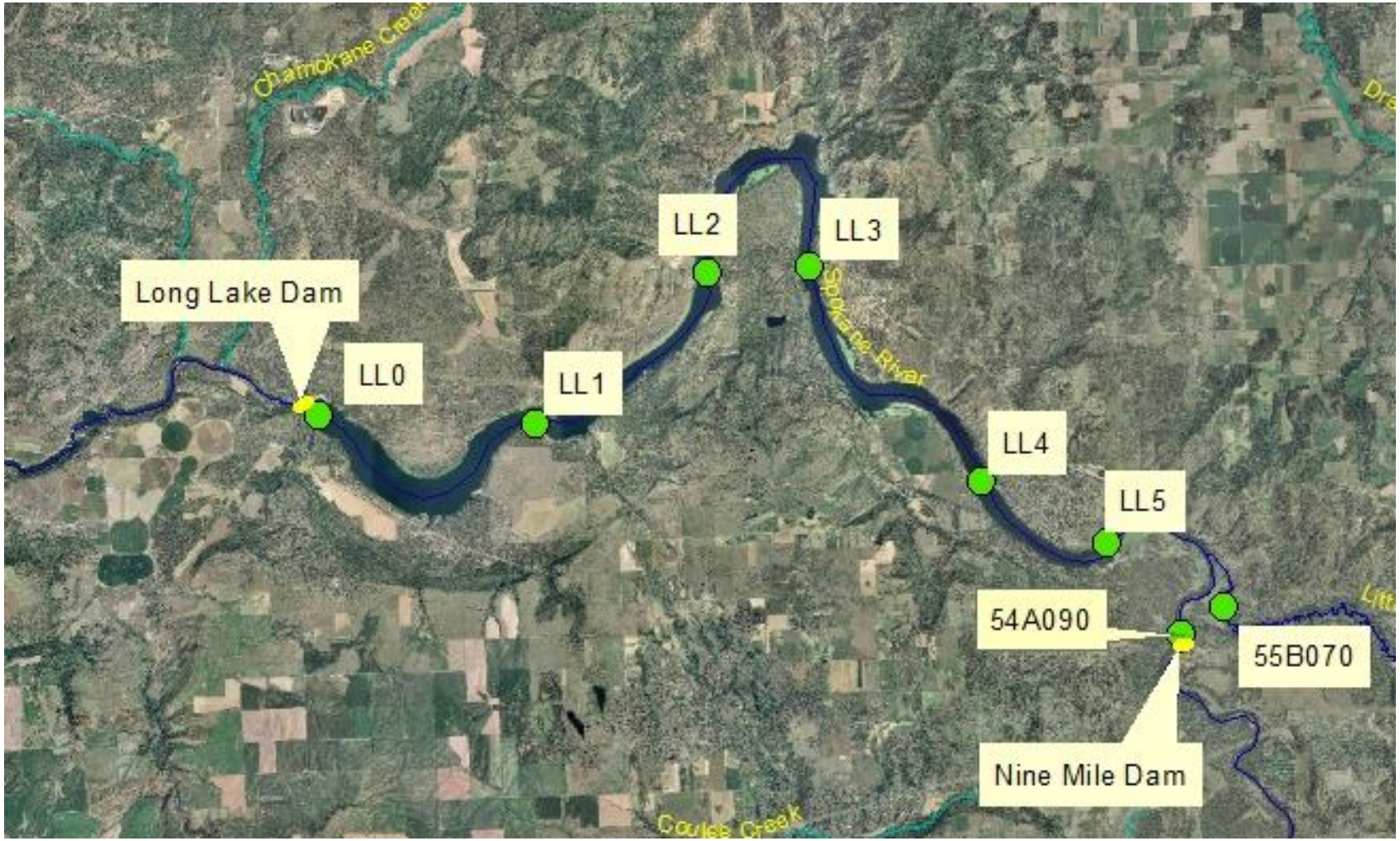
DO TMDL Advisory Committee Meeting

April 15, 2014

2013 Lake Spokane Monitoring and Implementation Activities

125 YEARS OF SERVICE 1889–2014

Lake Spokane Monitoring



Discrete Depth Sampling Stations

Lake Spokane Sampling Station and Discrete Depth						
	LL0	**LL1**	**LL2**	**LL3**	**LL4**	**LL5**
Depths	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					

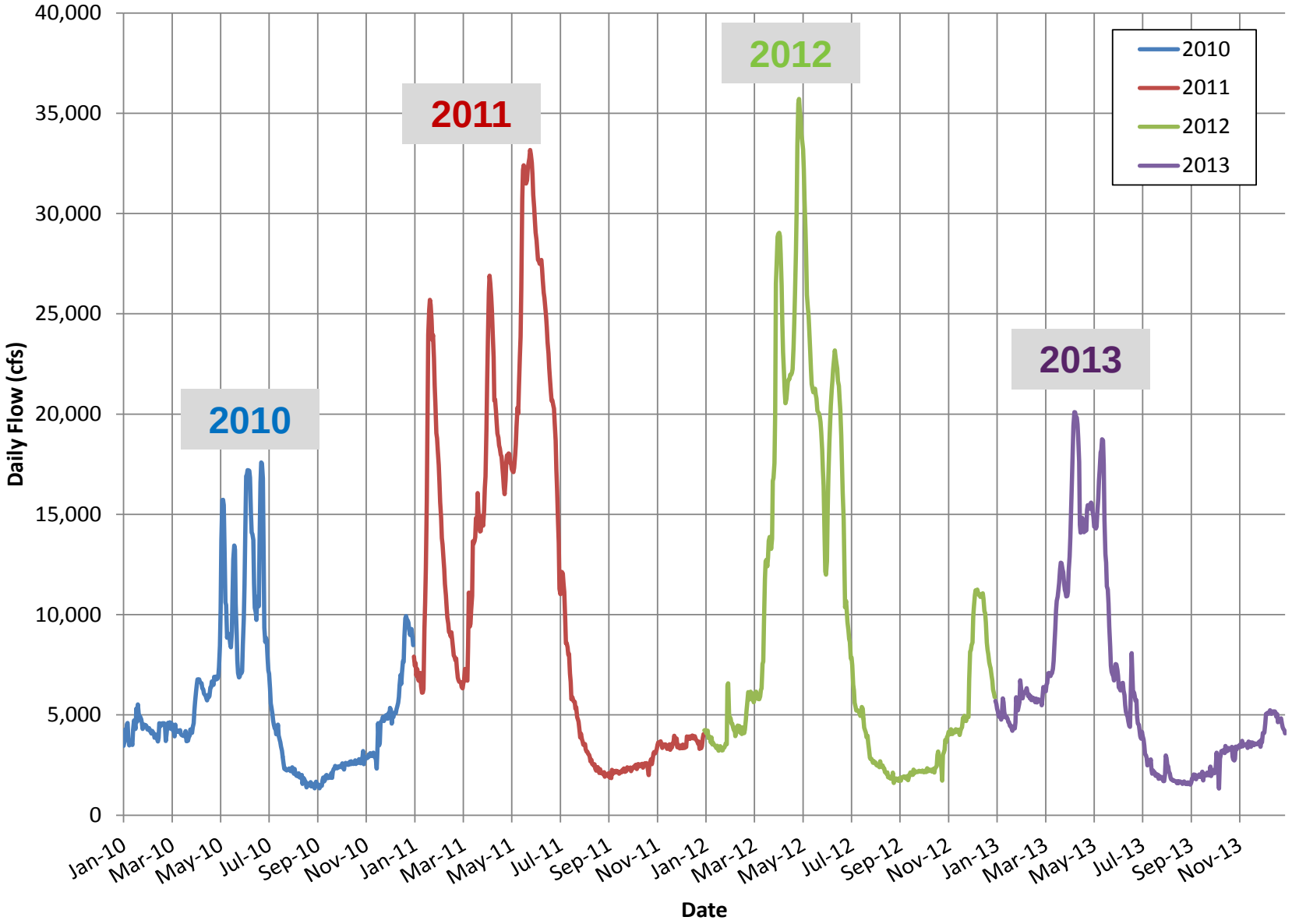
2013 Sample Dates:
- May 13-14
- June 11-12
- June 25-26
- July 9-10
- July 24-25
- August 5-6
- August 20-21
- Sept. 9-10
- Sept. 24-25
- October 14-15

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

Spokane River Flows 2010-2013



2013 Lake Spokane Monitoring

- Dissolved Oxygen
  - Max conc. ~11 to 13 mg/L
  - Ave conc. 8 to 10 mg/L
  - Min conc. 0 to 0.9 mg/L
  - Volume weighted hypolimnetic ave. ranged from 10.7 to 6.5 mg/L

- Total Phosphorus
  - Ranged from 3.9 to 67 μg/L
  - Volume weighted hypolimnetic TP conc. ave <20 μg/L

- Soluble Reactive Phosphorus
  - Ranged from non-detect (1.0 μg/L) to 27 μg/L

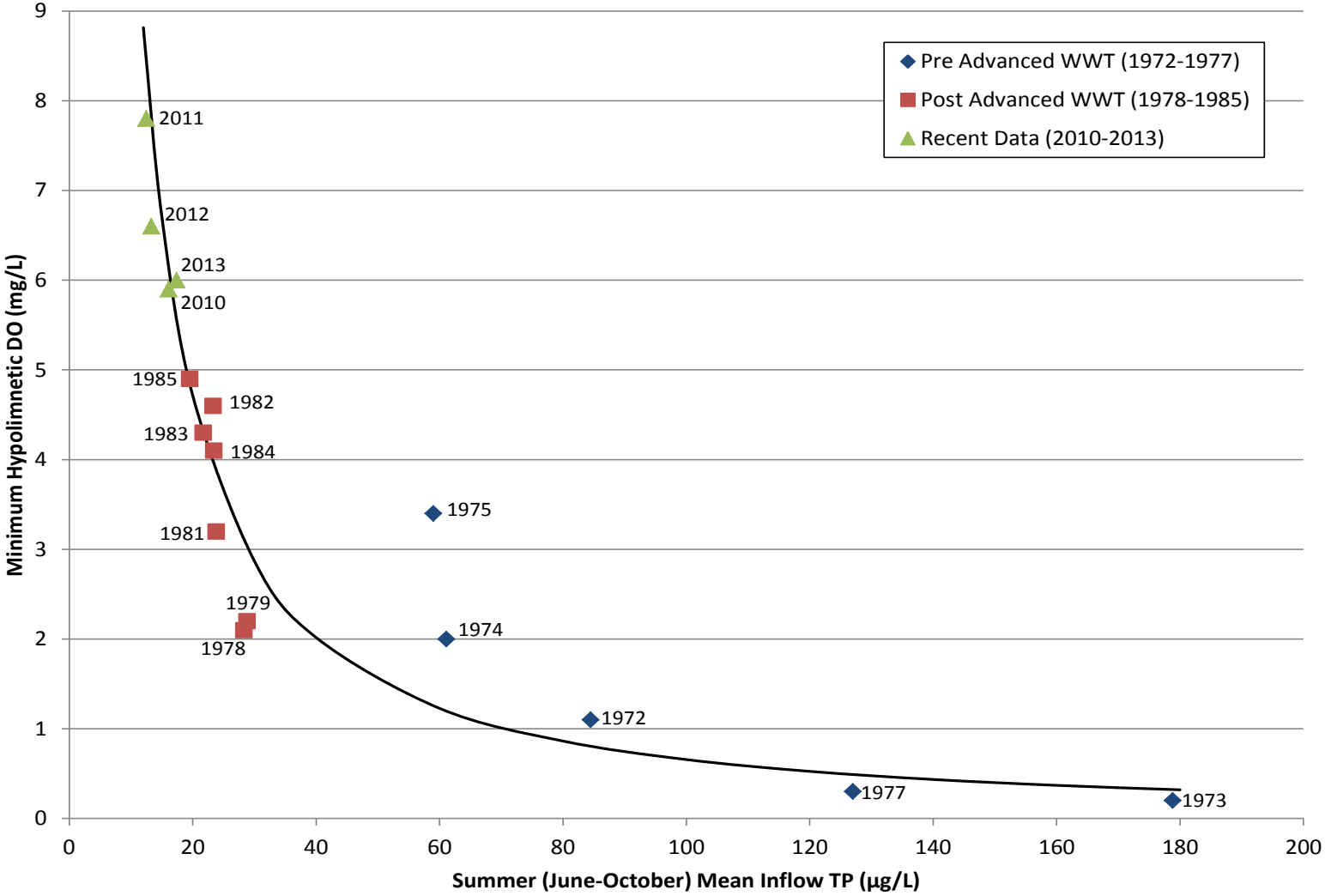
2013 Lake Spokane Monitoring

- Nitrogen
  - Ranged from 281 to 1,873 μg/L
  - Most of the TN consisted of nitrate + nitrite
- Chlorophyll-a
  - Ranged from 0.8 to 19.2 μg/L
  - Often highest at ~16 ft depth
- Transparency
  - Ranged from 6 to 25 m depth
- Phytoplankton/Zooplankton

Measures of Improvement

- Minimum volume-weighted hypolimnetic DO average over time
  - Increased substantially since 1977.
- Lake's trophic state index
- Habitat evaluation

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

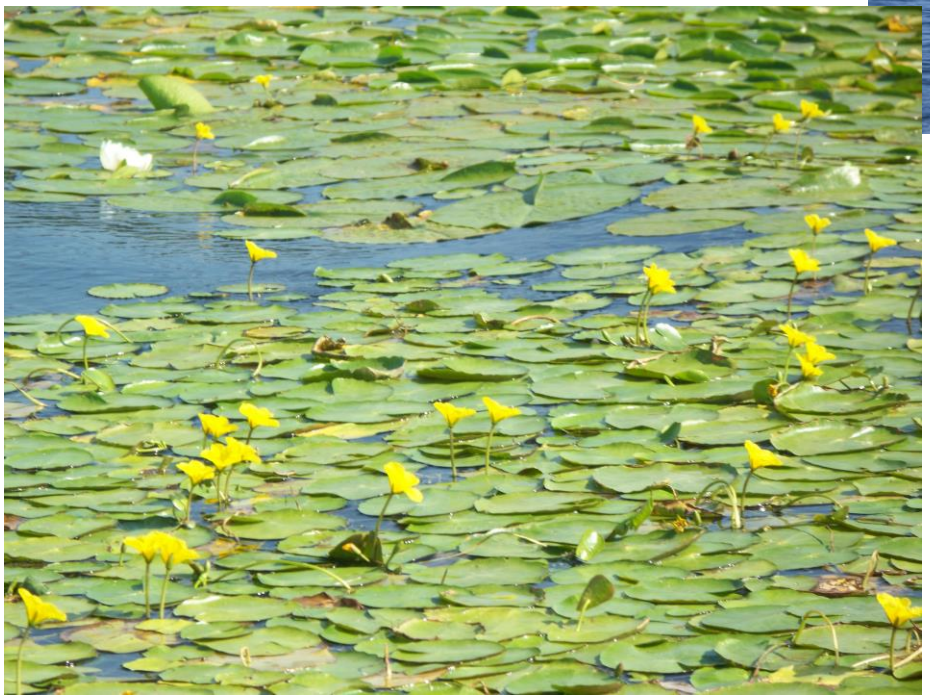


Source: TetraTech 2014 (Lake Spokane Annual Summary Report, 2013 Baseline Water Quality Monitoring Results

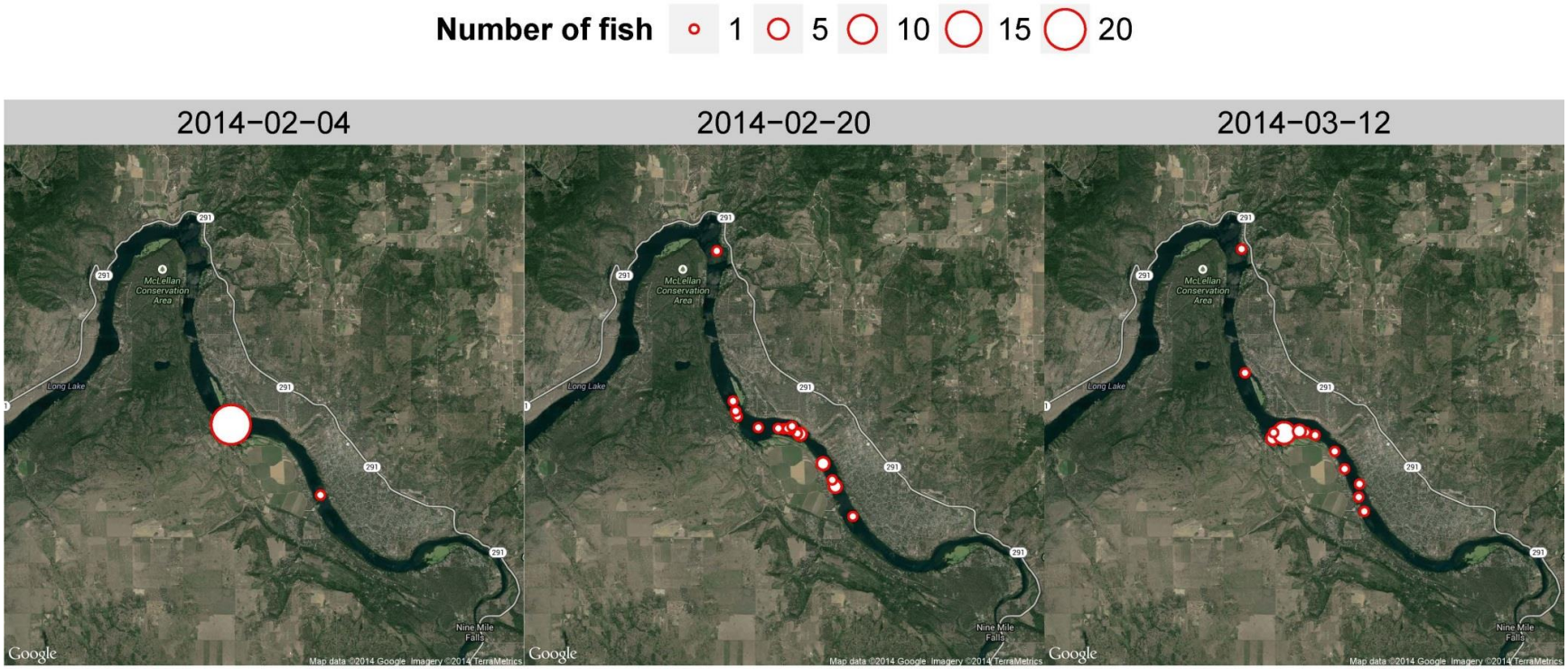
2013 DO WQAP Implementation

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

Harvesting Aquatic Weeds?



Carp Population Reduction?



2013 DO WQAP Implementation

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

QUESTIONS?