



The Effect of Sediment Pollution from Hangman Creek on the Spokane River

A citizen science partnership between Spokane Falls Trout Unlimited and the
Spokane Riverkeeper

September 4th, 2018

Jule Schultz, Jerry White Jr., Lee First

Presented to Spokane Falls Trout Unlimited Monthly Meeting

Hangman Creek and Spokane River Confluence, February 2017



Effect of Sedimentation in the Spokane River



Before

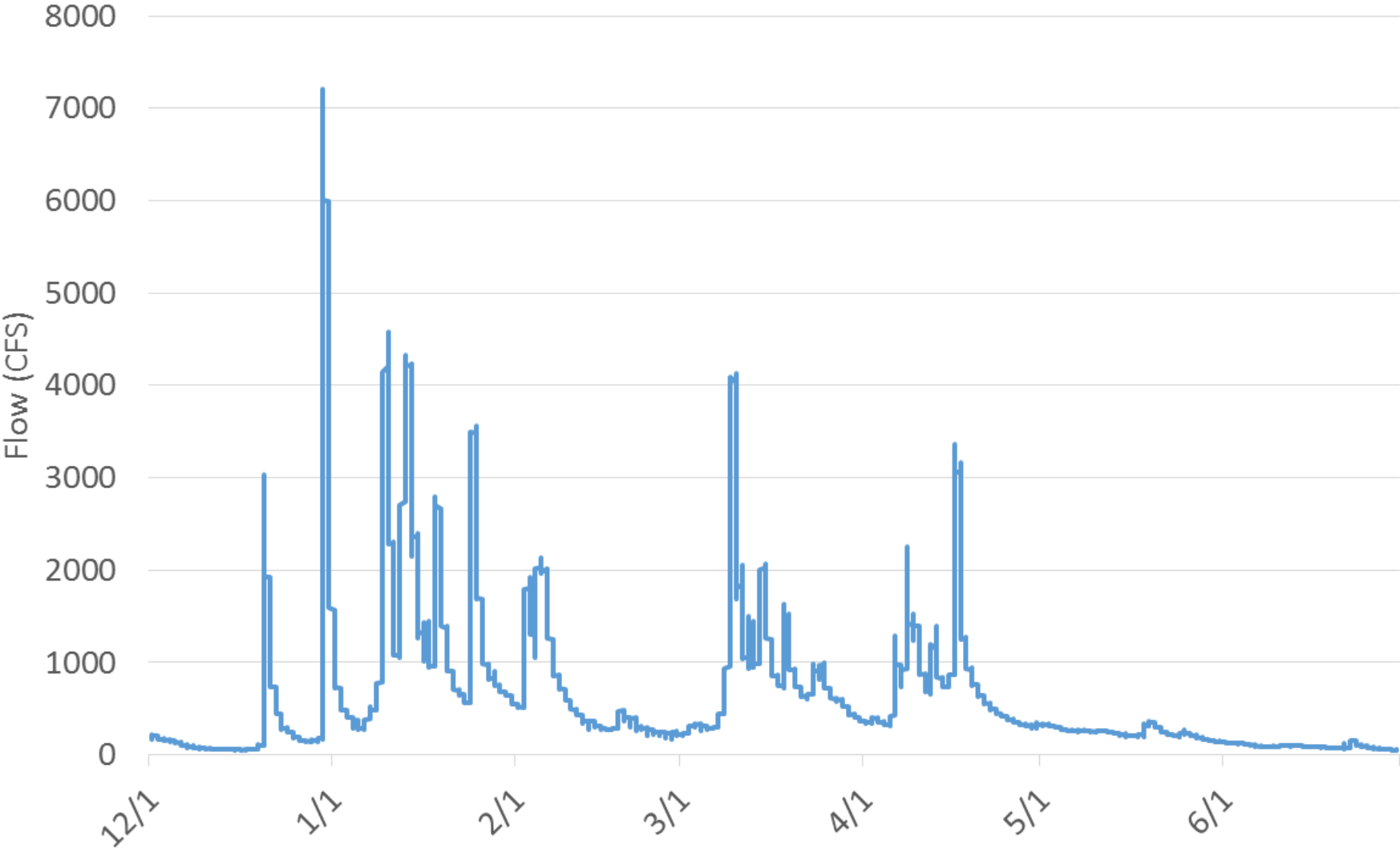


After

Hangman Creek



Hangman Creek Flow 2018



Sediment and Hangman Creek

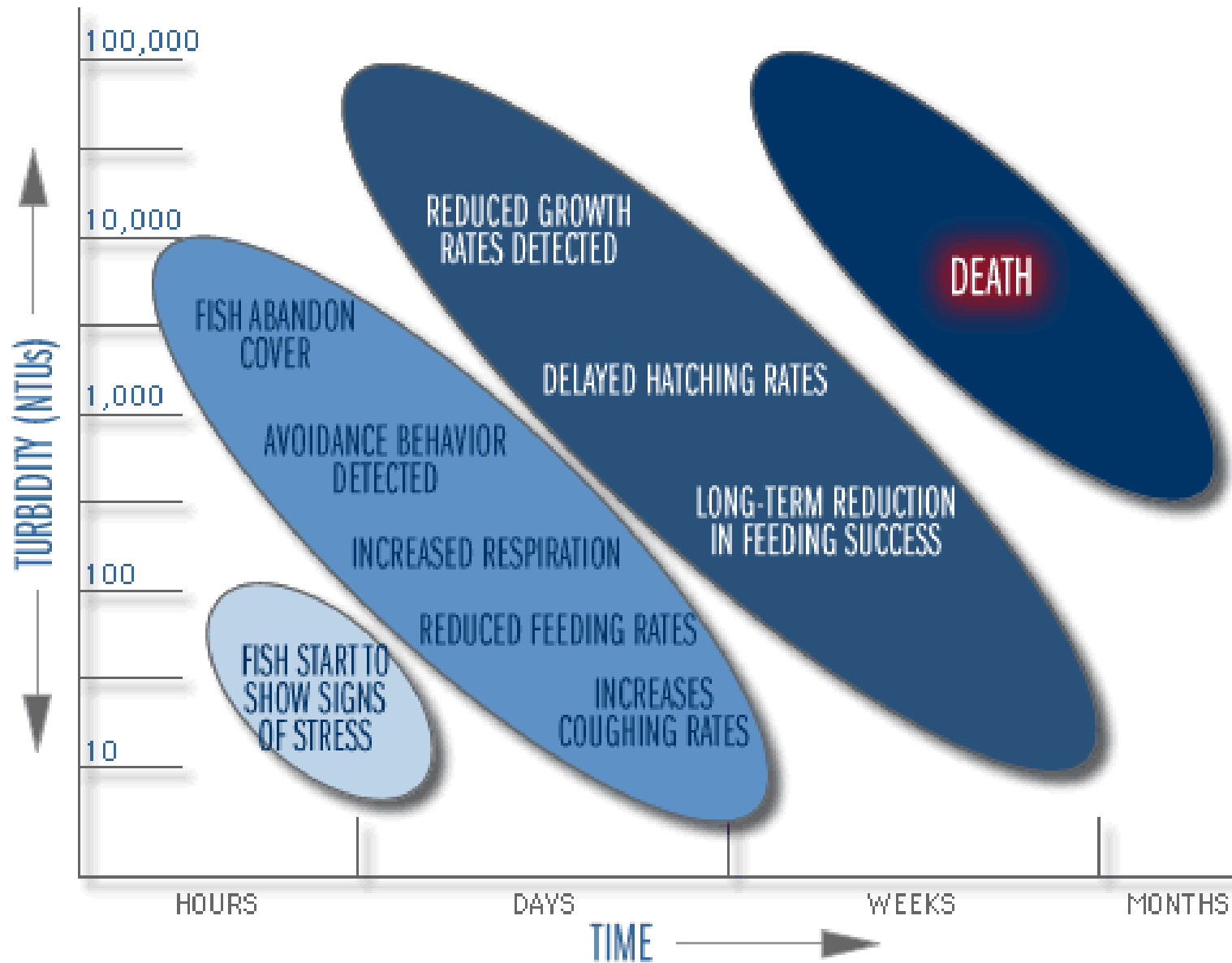
- Sediment a recognized problem in the Creek
 - Does not meet water quality standards
 - TMDL
 - “Among worst in state”
 - Up to 200,000 tons/year
 - Correlates with flow



3-13-18

Sediment Harms Fish

RELATIONAL TRENDS OF FRESH WATER FISH ACTIVITY TO TURBIDITY VALUES AND TIME



The Effect of Hangman Creek Sediment on the Spokane River

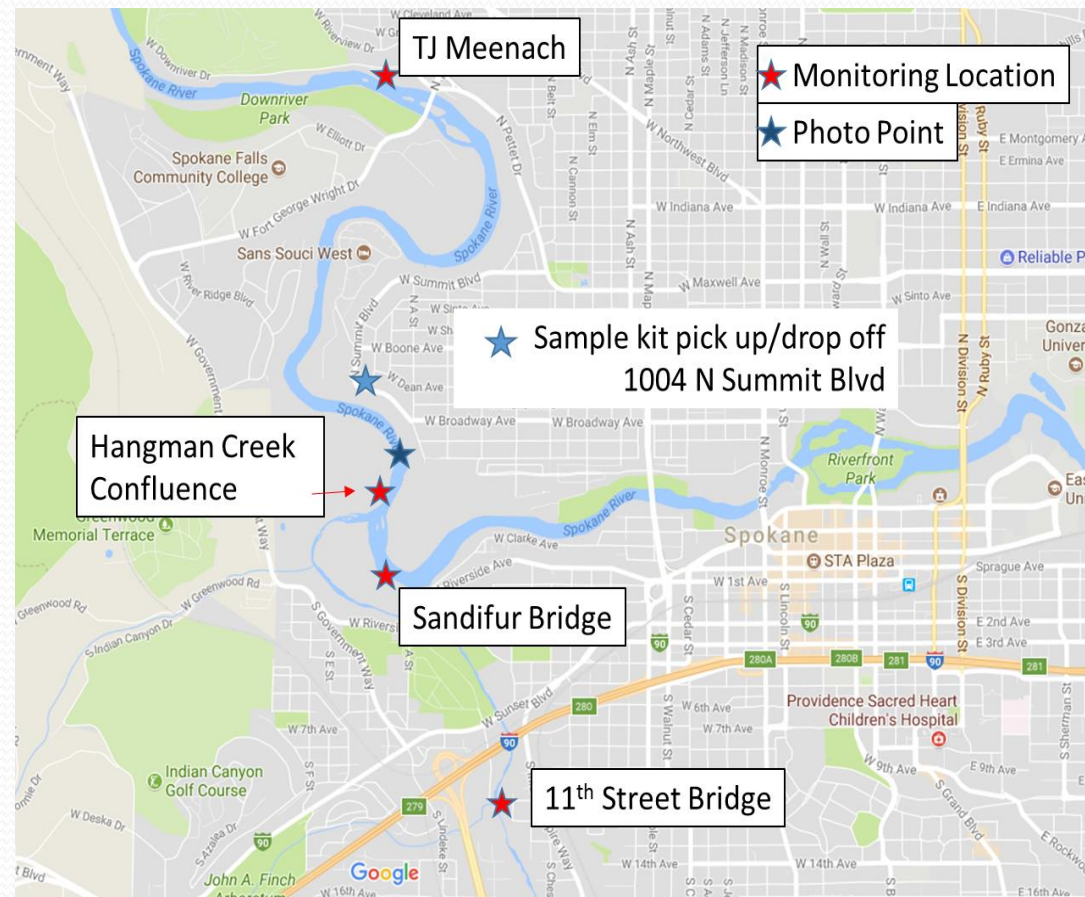
- Easily measured!
 - Transparency Tube to measure transparency
 - Analogous to ***Turbidity***
 - Results in centimeters
- Method – measure transparency in
 - Hangman Creek
 - Spokane River above and below the Hangman Creek Confluence



Measuring Turbidity

(aka Transparency, Sediment)

- Sampling Locations
 - Hangman
 - 11th Street
 - Spokane River
 - Sandifur Bridge
 - Confluence (Riverside Cemetery)
 - TJ Meenach Bridge
- Photo Point
 - Summit Blvd





Results!!

- 69 sampling runs
- 238 turbidity measurements
- ~21 Participants
- 53 photos
- ~105 hours volunteered
(estimated 1.5 hours per run)



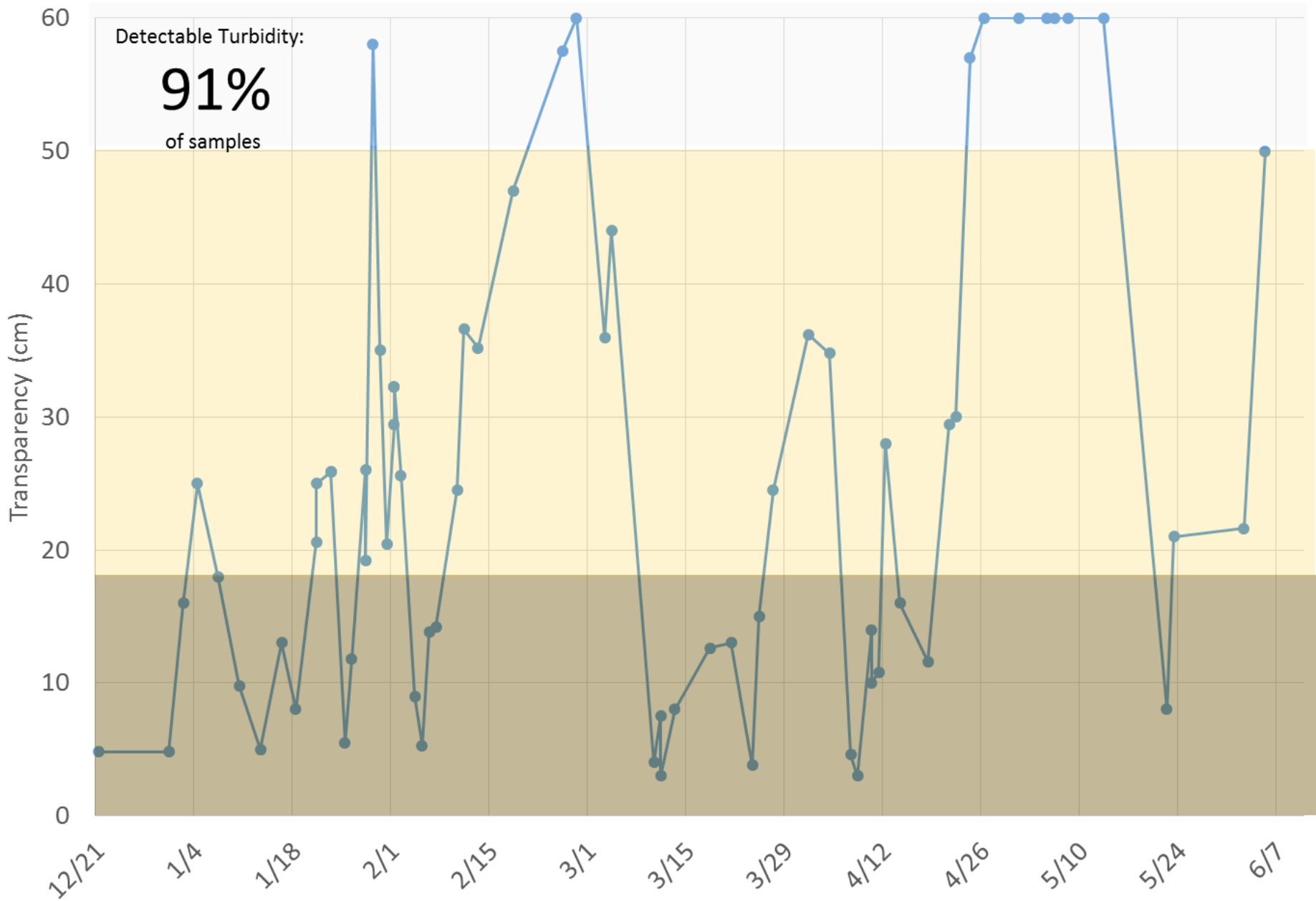
Results!

Transparency Data Summary

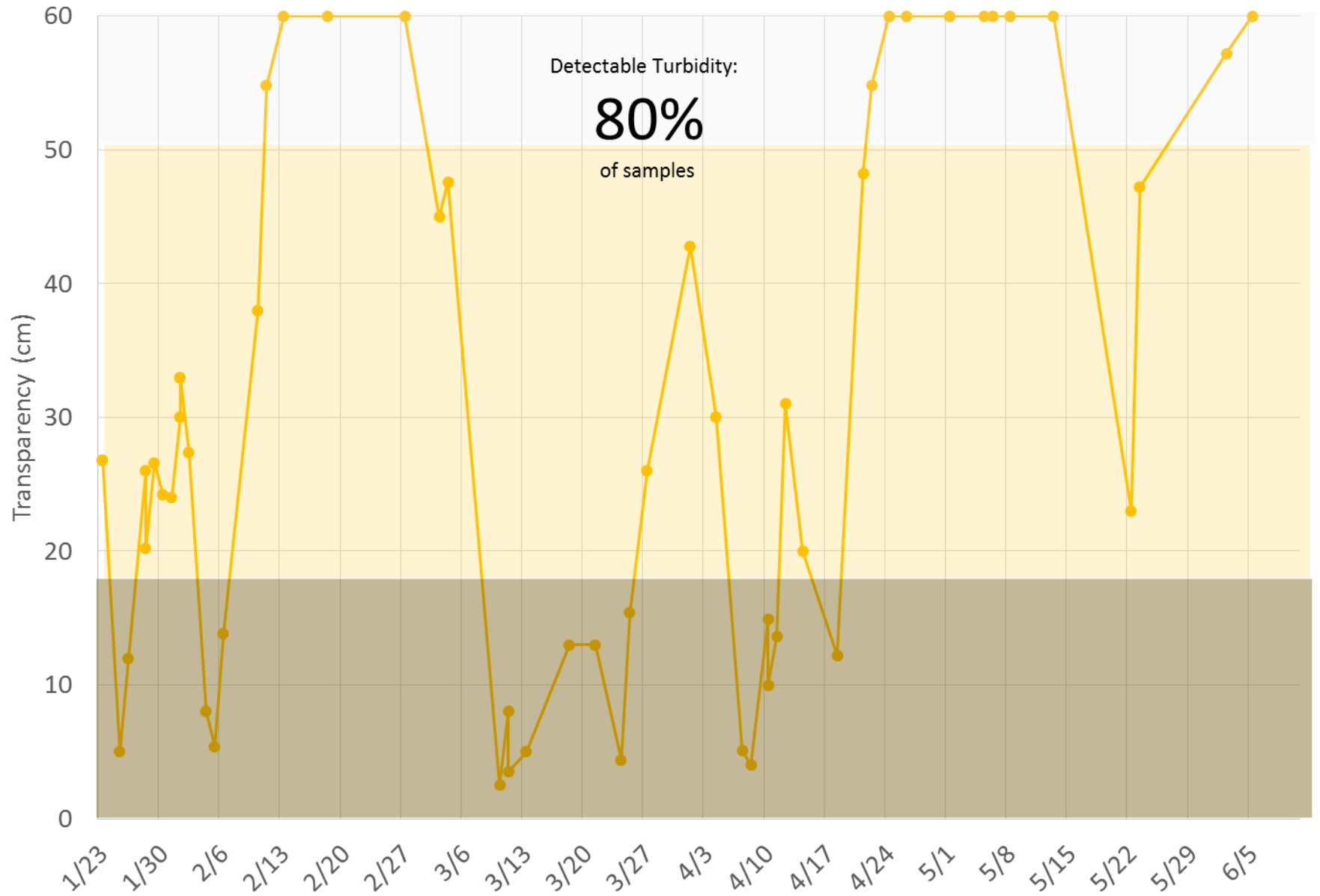
Location	N	Median (cm)	Min (cm)	Max (cm)
11th Street - Hangman	69	21.3	3	60
Riverside Cemetery - Spokane	57	26.8	2.5	60
Sandifur Bridge - Spokane	49	60	37	65
TJ Meenach Bridge - Spokane	63	60	6	65



Hangman Creek-11th Street Bridge Transparency



Spokane River-Riverside Cemetery



Spokane River - Sandifur Bridge (Upstream of Confluence)

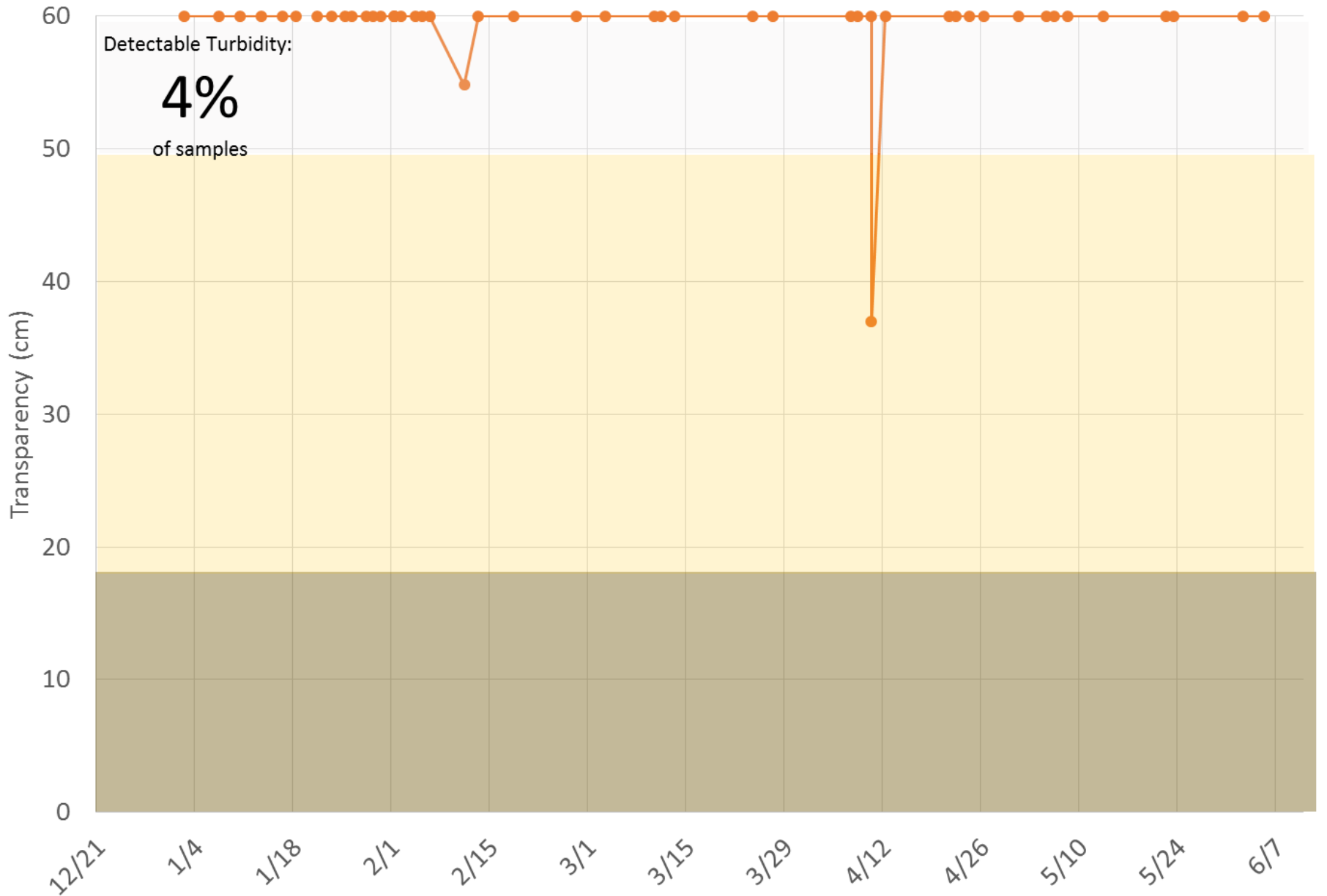
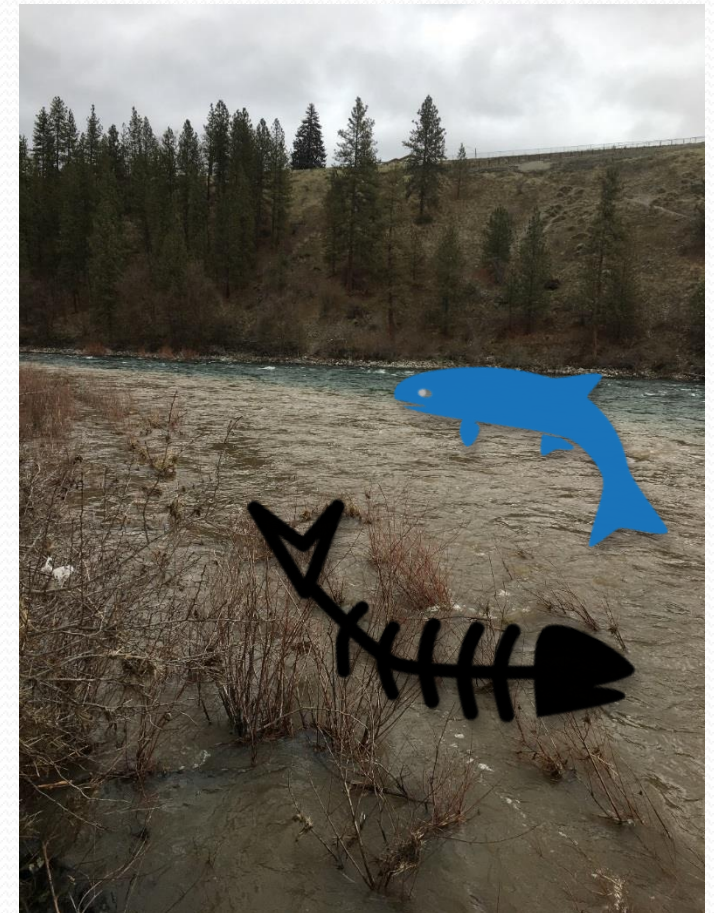


Photo Album

by Jule Schultz

Results Clearly Impact Trout and other Fishes

- Duration and intensity of turbidity seen in this study impacts fish
 - Control carrying capacity?
 - Loss of spawning habitat?
- Macroinvertebrate impacts
- Other Nasties
 - PCBs
 - Total Phosphorous
 - Dissolved Oxygen



Next Steps

- Letter to Ecology
- Another Study
- Distributed Report
- Further Analysis



Transparency Conversion Chart

Centimeters	Inches	Approximate NTU Value
<6.4	<2.5	>240
6.4 to 7.0	2.5 to 2.75	240
7.1 to 8.2	2.76 to 3.25	185
8.3 to 9.5	3.26 to 3.75	150
9.6 to 10.8	3.76 to 4.25	120
10.9 to 12.0	4.26 to 4.75	100
12.1 to 14.0	4.76 to 5.5	90
14.1 to 16.5	5.6 to 6.5	65
16.6 to 19.1	6.6 to 7.5	50
19.2 to 21.6	7.6 to 8.5	40
21.7 to 24.1	8.6 to 9.5	35
24.2 to 26.7	9.6 to 10.5	30
26.8 to 29.2	10.6 to 11.5	27
29.3 to 31.8	11.6 to 12.5	24
31.9 to 34.3	12.6 to 13.5	21
34.4 to 36.8	13.6 to 14.5	19
36.9 to 39.4	14.6 to 15.5	17
39.5 to 41.9	15.6 to 16.5	15
42.0 to 44.5	16.6 to 17.5	14
44.6 to 47.0	17.6 to 18.5	13
47.1 to 49.5	18.6 to 19.5	12
49.6 to 52.1	19.6 to 20.5	11
52.2 to 54.6	20.6 to 21.5	10
>54.7	>21.6	<10

H
C
S
W

7

F
V
C
L