

Bull Trout Movement at Multiple Life Stages in the White River, WA

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Outline

- Bull Trout
- White River Basin
- Historic Data
- PIT tagging and Antenna Arrays
- Results
- Moving Forward



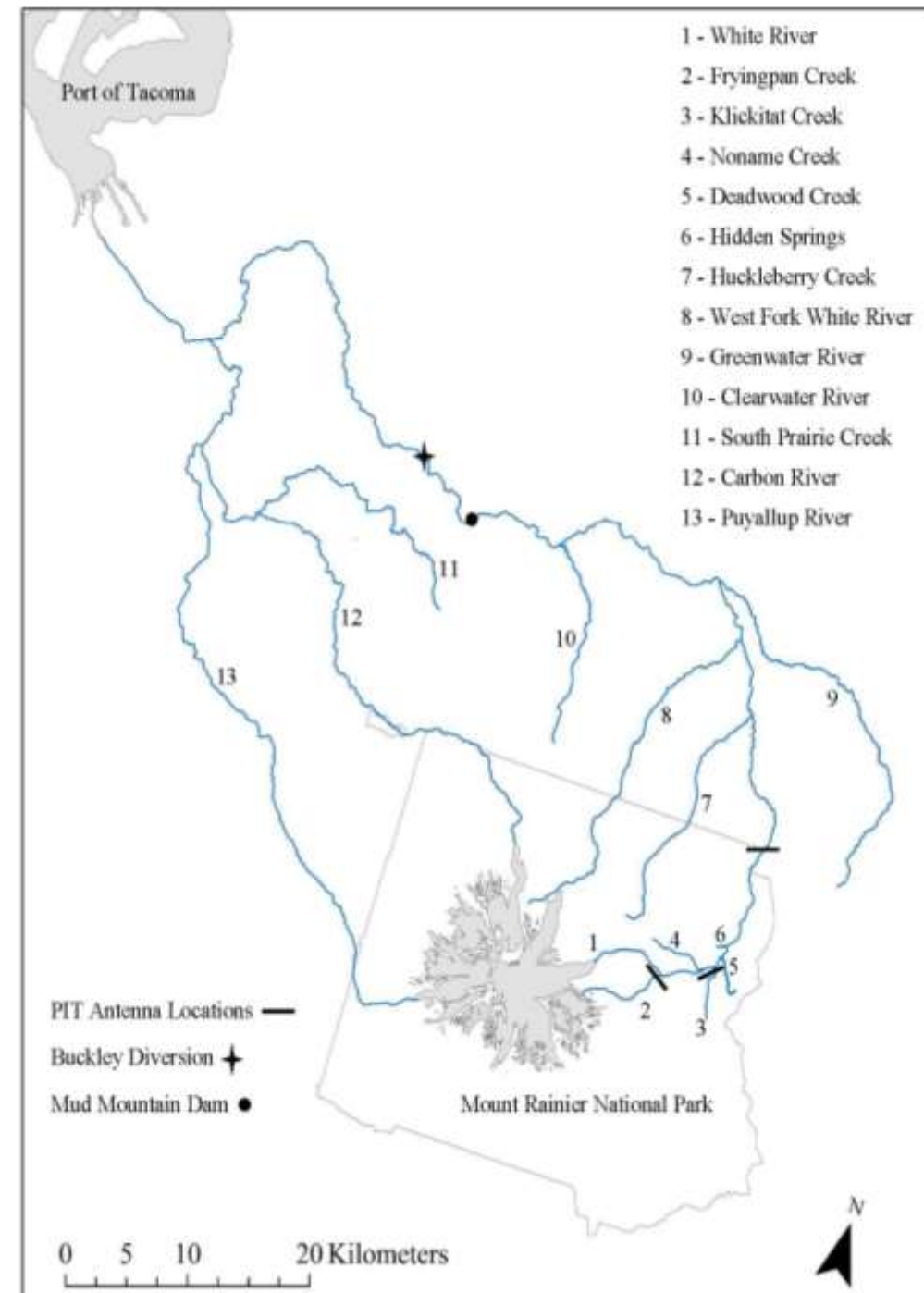
Bull Trout

- ESA listed threatened
- Limited knowledge about life history variation
- Potentially high variability among watersheds
- Understand how different strategies contribute to abundance and stability for each population



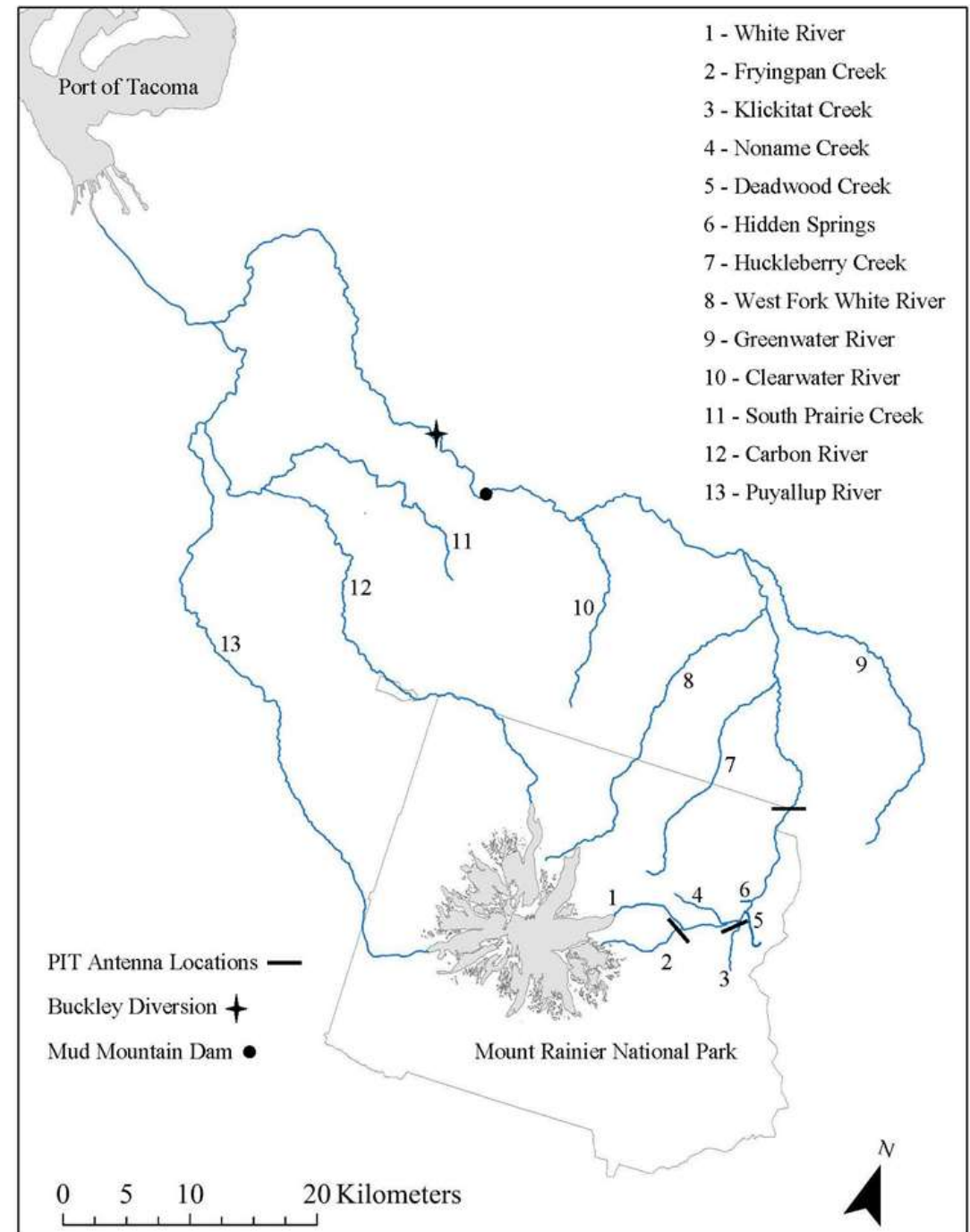
White River

- Upper watershed lies within Mount Rainier National Park
- Puyallup River Tributary
 - Enters Puget Sound at Port of Tacoma
- Coastal recovery unit, Puget Sound distinct population segment
- Mud Mountain Dam
- Buckley Diversion



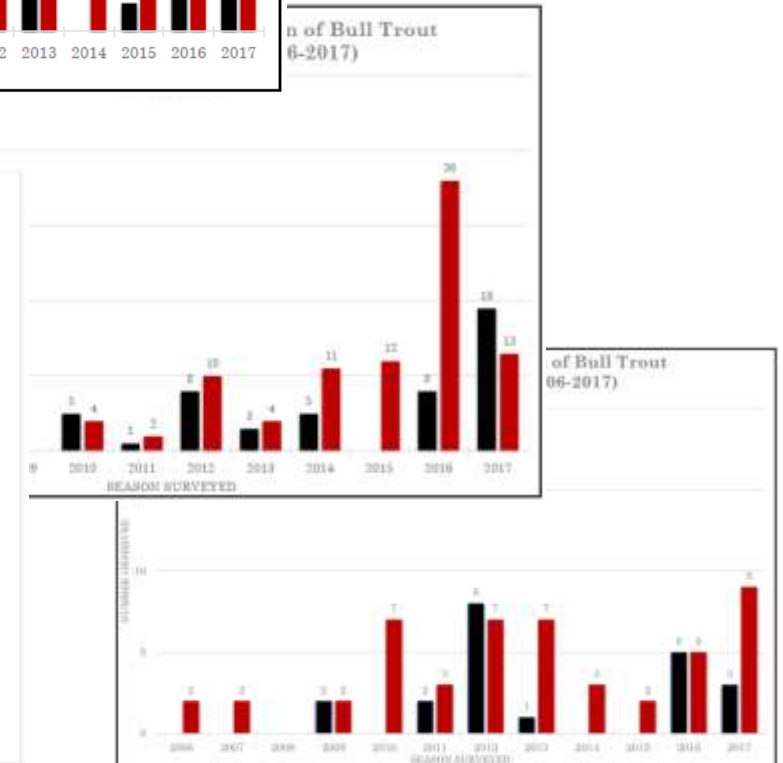
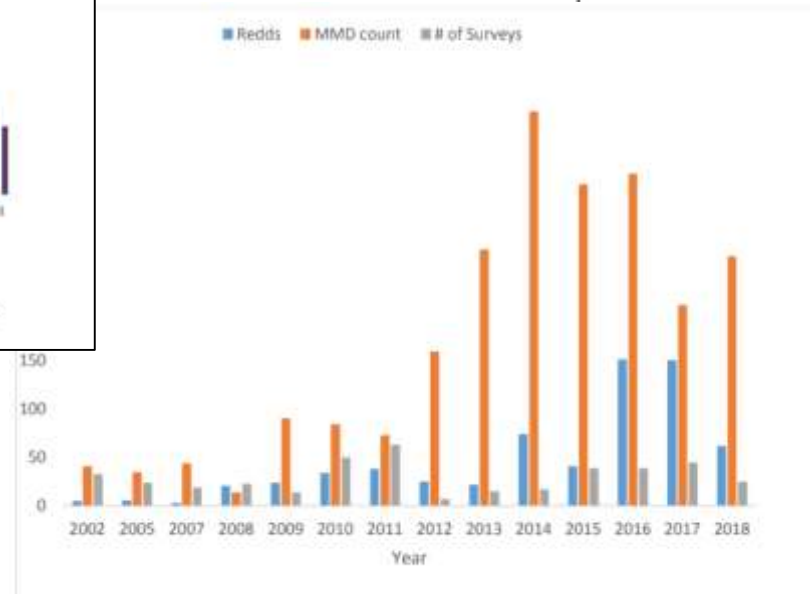
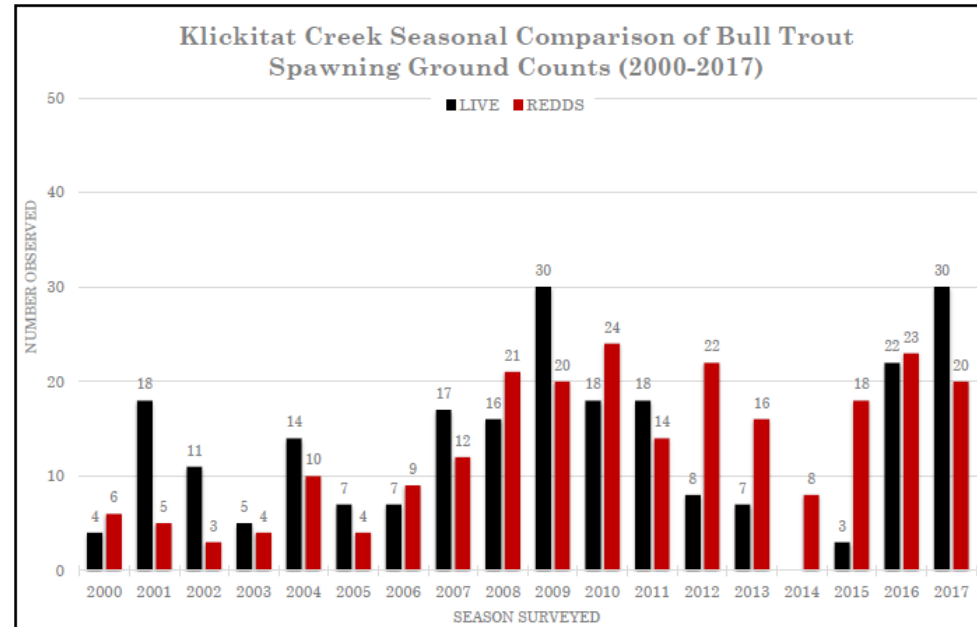
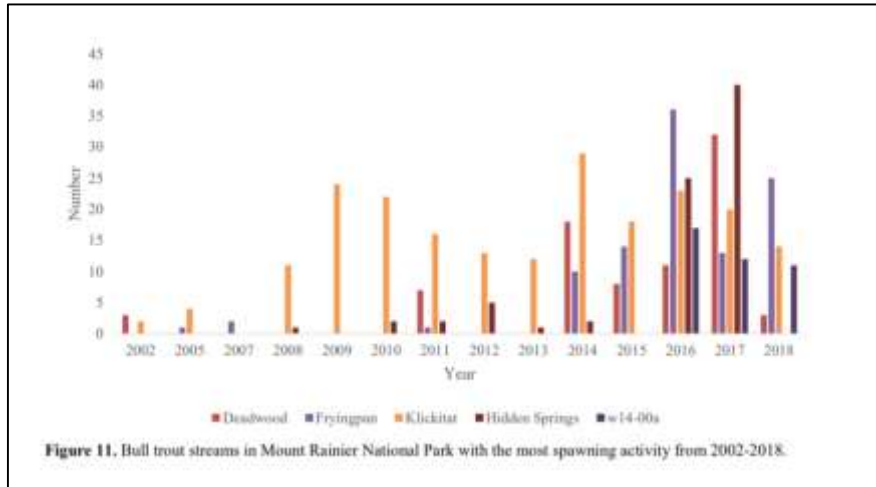
Buckley Diversion and Mud Mountain Dam

- Trap and haul facility at Buckley
- Tagging Bull Trout since 2010



Historic Data

- Fish passed at Buckley Trap
- Spawning ground surveys by PTF and MORA



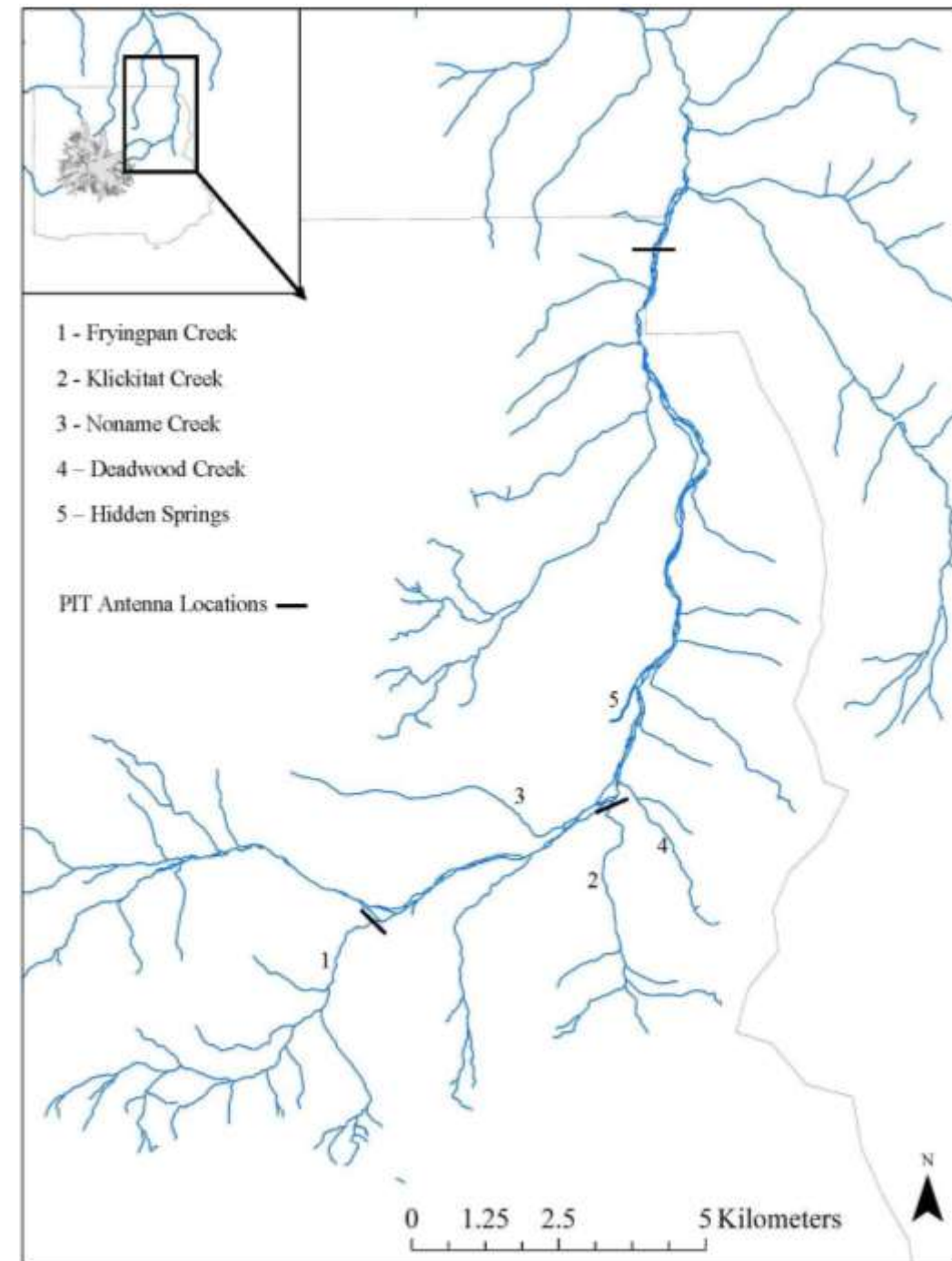
Method

- Tag juvenile fish in the upper basin (within MORA)
- Monitor movements with a network of PIT tag antennas
 - High spawning activity tributaries
- Recapture at Buckley



PIT tagging 2017

Stream	Total	Minimum	Maximum
Antler	2	131	245
Fryingpan	42	104	292
Klickitat	1	260	260
Shaw	2	149	171
Sunrise	1	140	140
Wright	11	125	253
Total	59	104	292



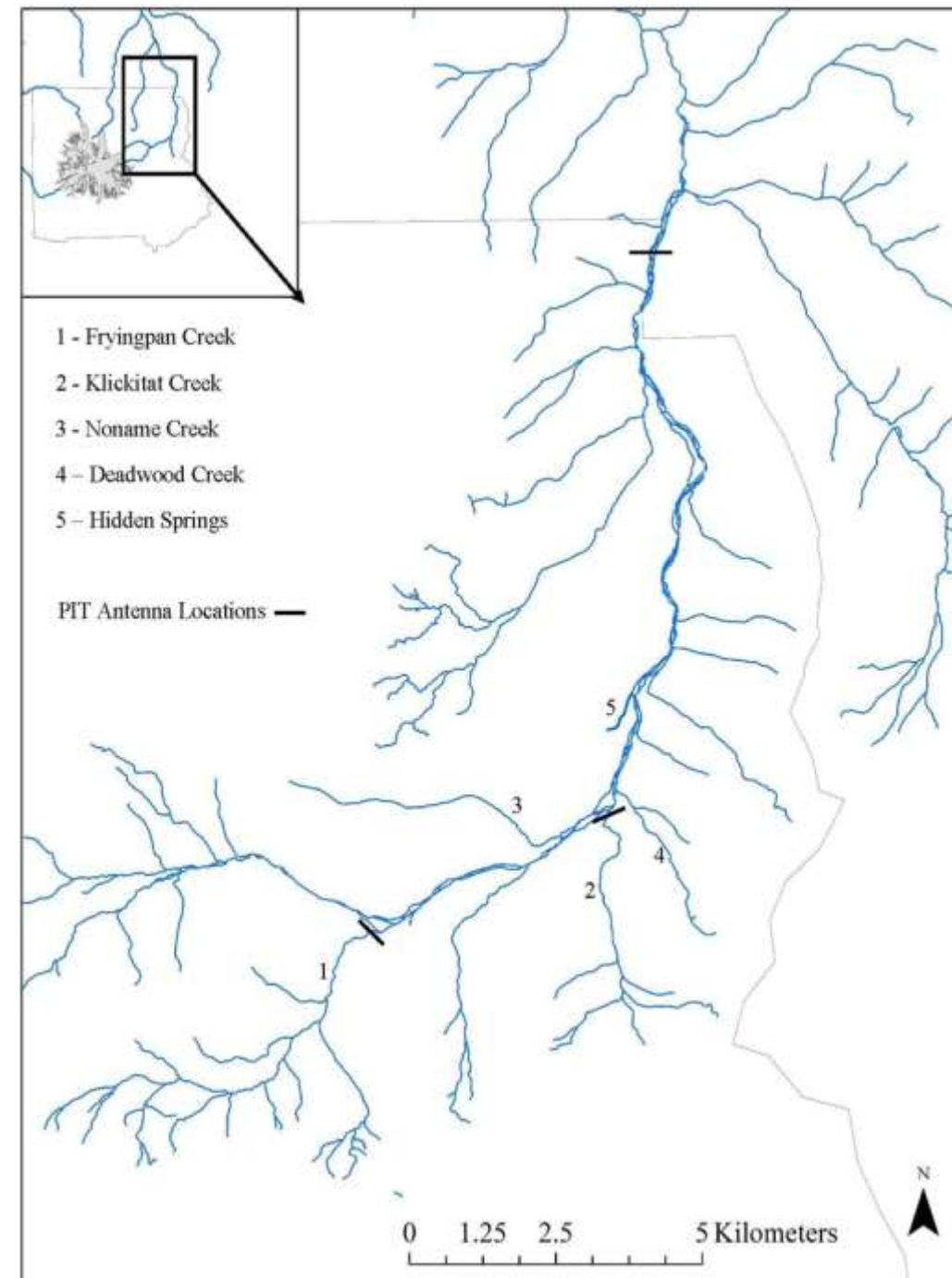
Antenna Array 2017

- Fryingpan Creek
- 20 foot antennas
- July 17th to Oct 19th



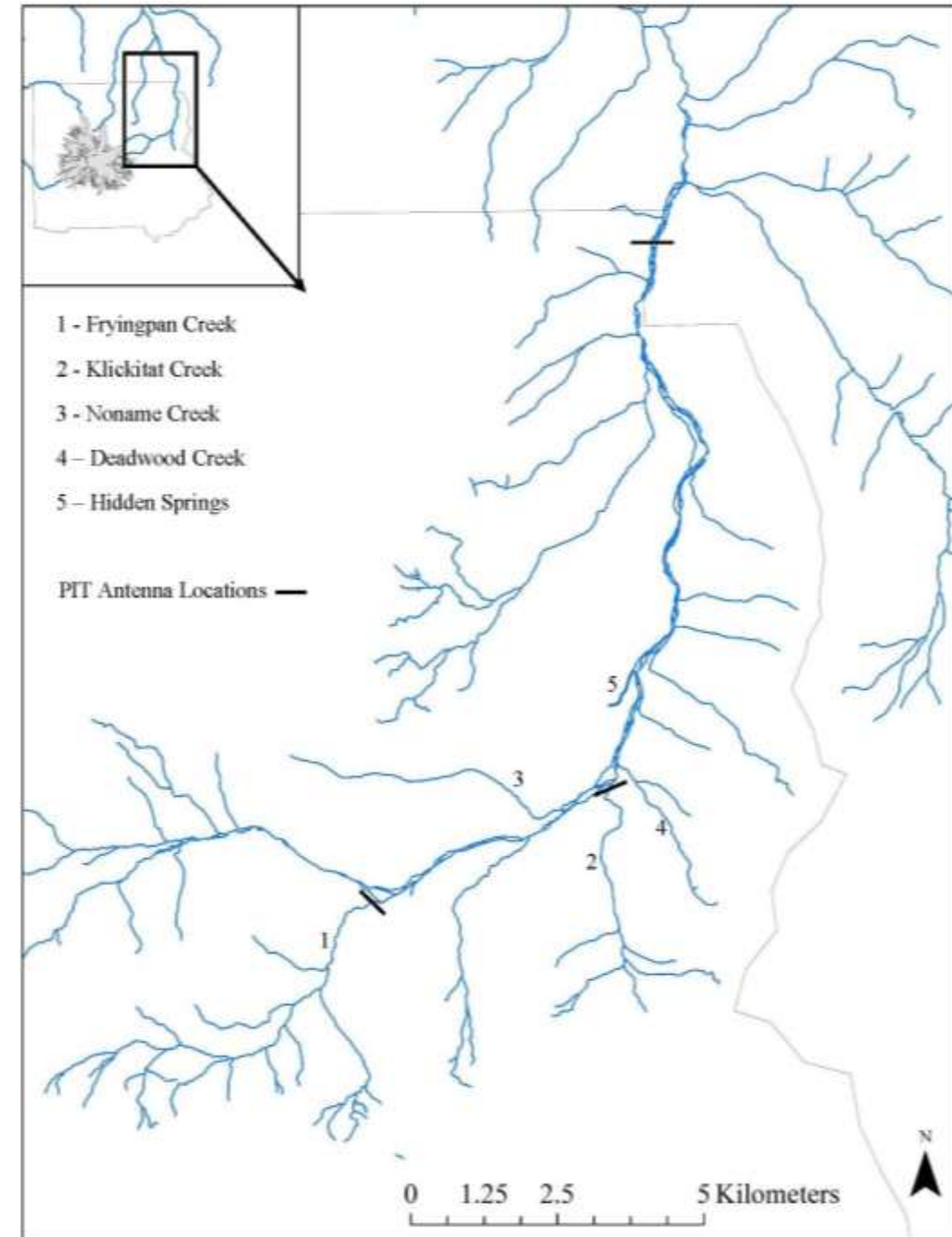
PIT tagging 2018

Stream	Total	Minimum	Maximum
Deadwood	8	120	138
Fryingpan	73	114	311
Hidden Springs	10	113	138
Interfork	2	224	232
Klickitat	7	107	200
Noname	32	112	267
Shaw	3	115	142
Sunrise	1	113	113
W-07	6	117	158
Wright	31	125	257
White River	24	106	405
Total	196	106	405



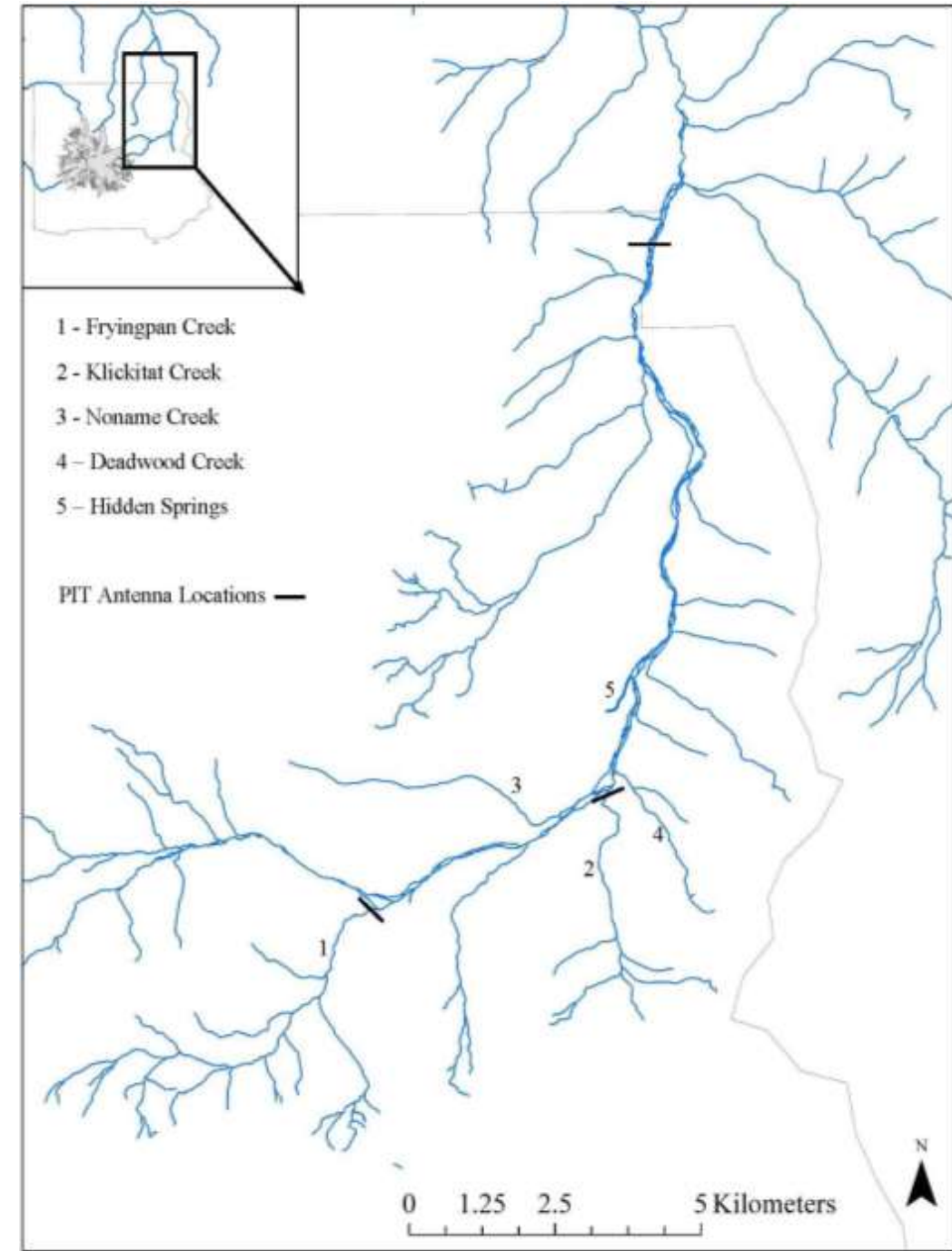
Antenna Arrays 2018

- Boundary site
- 2 – 20 foot floating arrays
- May 7th and July 9th – October 26th



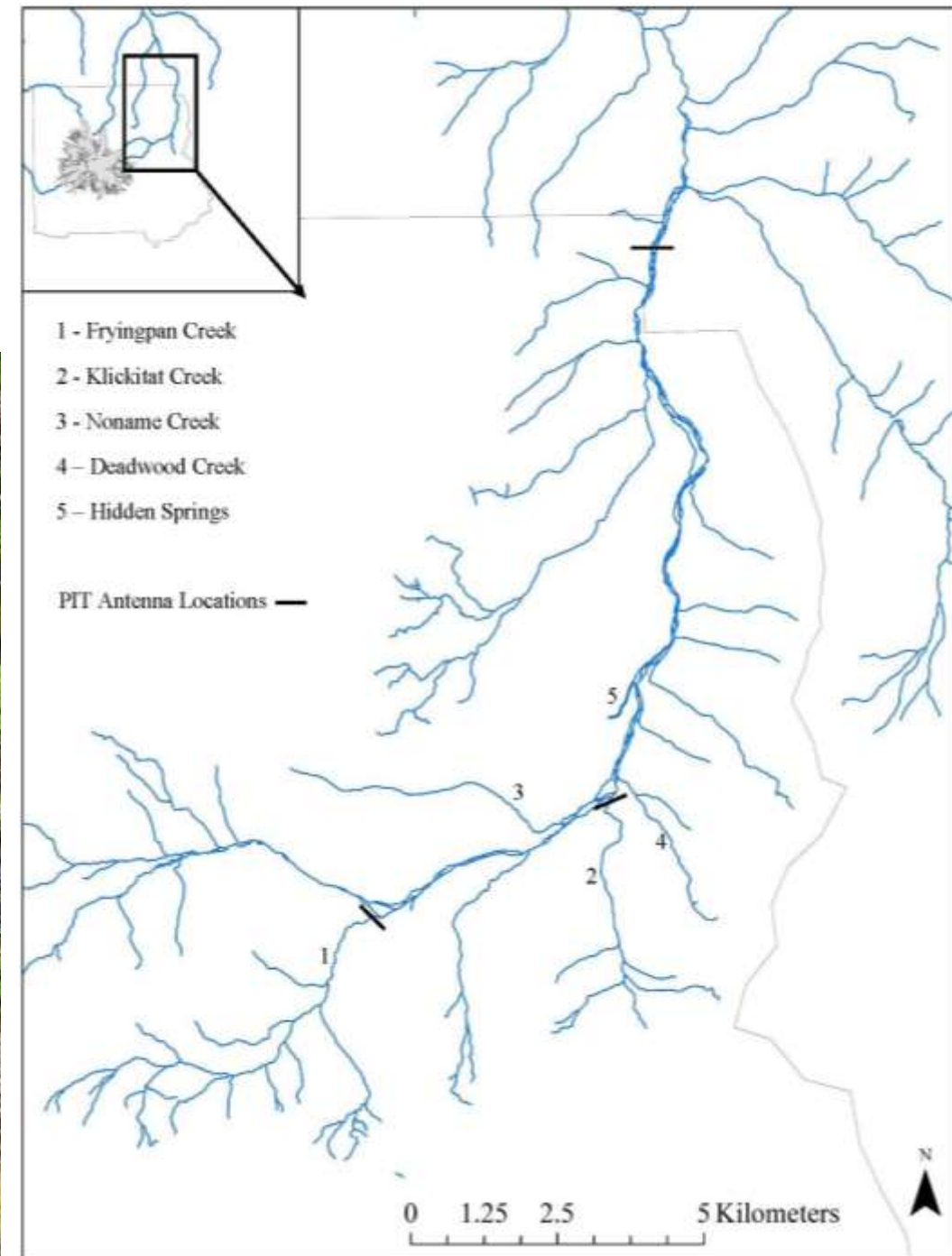
Antenna Arrays 2018

- Fryingpan Creek
- 2 – 20 foot floating arrays



Antenna Arrays 2018

- Klickitat Creek
- 20 foot flexible antenna



Detections

	#				Unique	%
	Tagged	Boundary	Fryingpan	Klickitat	Detections	Detected
Antler	2	0	0	0	0	0
Deadwood	8	0	0	0	0	0
Fryingpan	115	1	16	0	16	14
Hidden Springs	10	0	0	0	0	0
Interfork	2	0	1	1	1	50
Klickitat	8	1	0	0	1	13
Noname	32	0	0	1	1	3
Shaw	5	0	0	0	0	0
Sunrise	2	0	0	0	0	0
W-07	6	1	0	0	1	17
Wright	24	1	2	0	2	8
White River	42	1	0	0	1	2
Total	255	5	19	2	23	9



Detections

The Majority of fish tagged within MORA have not been detected (23 of 255)

- 6 fish detected at boundary site
 - 4 detected only at boundary, 2 at Fryingpan and Boundary
- 18 MORA fish detected at Fryingpan
 - 10 fish detected numerous times
 - 6 fish likely downstream migrants
 - 2 additional downstream migrants also detected at Boundary site
- 2 MORA fish detected at Klickitat



Detections

	Boundary	Fryingpan	Klickitat	Total Unique
BDD	87	19	13	92
MORA	6	18	2	23
Total	92	37	15	115

	Boundary/ Fryingpan	Fryingpan/ Klickitat	Klickitat/ Boundary	Total
BDD	15	0	10	25
MORA	2	1	0	3
Total	17	1	15	28



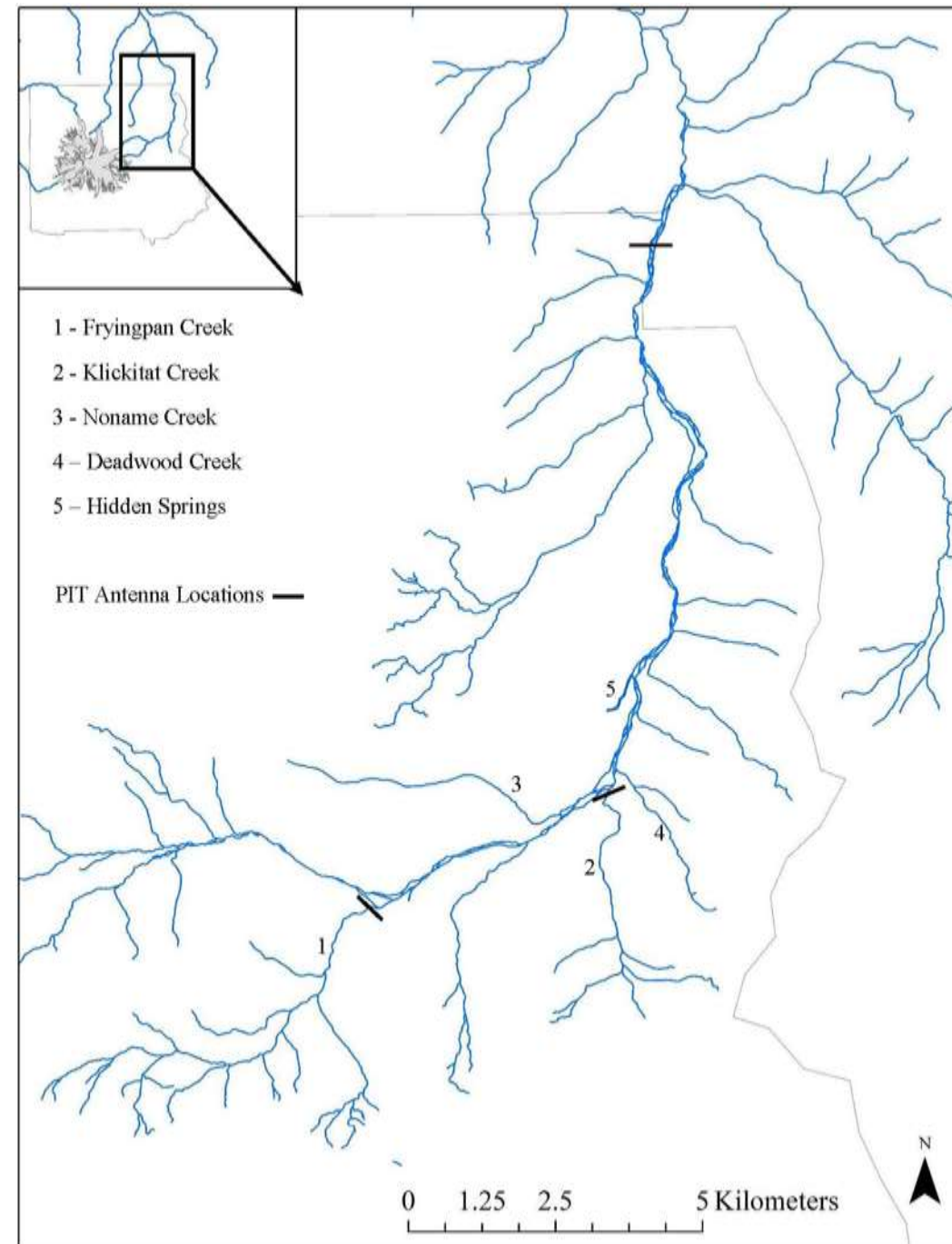
Detections

- 2 Fish were not handled at the Buckley trap
 - Potentially stayed upstream
- 10 Fish detected at Fryingpan in 2017 were detected again in 2018
 - 6 at Boundary
 - 5 at Fryingpan
 - 1 at Klickitat



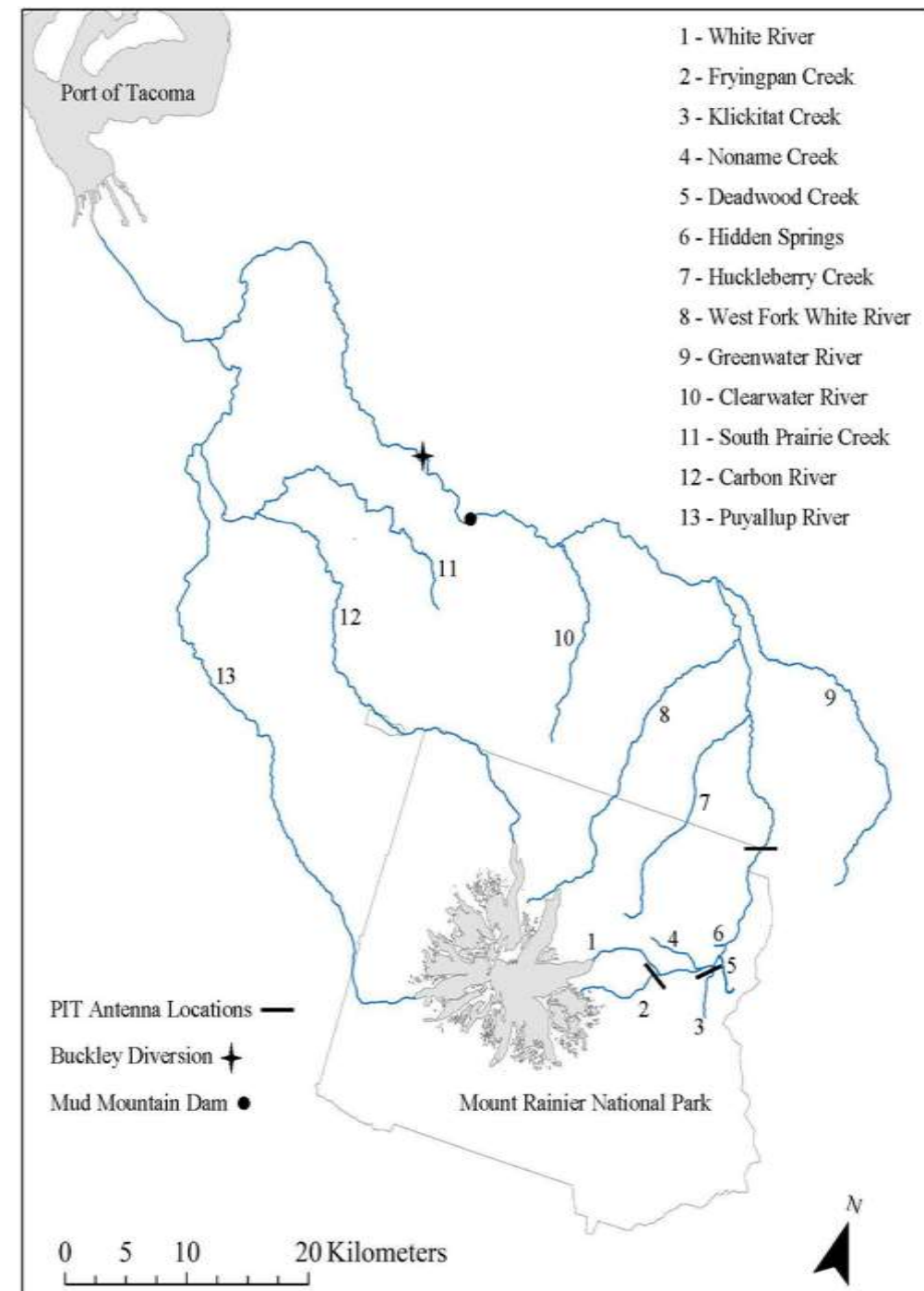
Observations

- Juvenile / upper basin fish will use multiple tributaries
- Move downstream at different lengths
- Large migratory fish may reside upstream
- Lack of spawning fidelity



Moving Forward

- More fish
- More antennas
- Understanding diversity in life history to promote conservation strategies
 - Abundance
- Changes to MMD and Buckley Diversion



Acknowledgements

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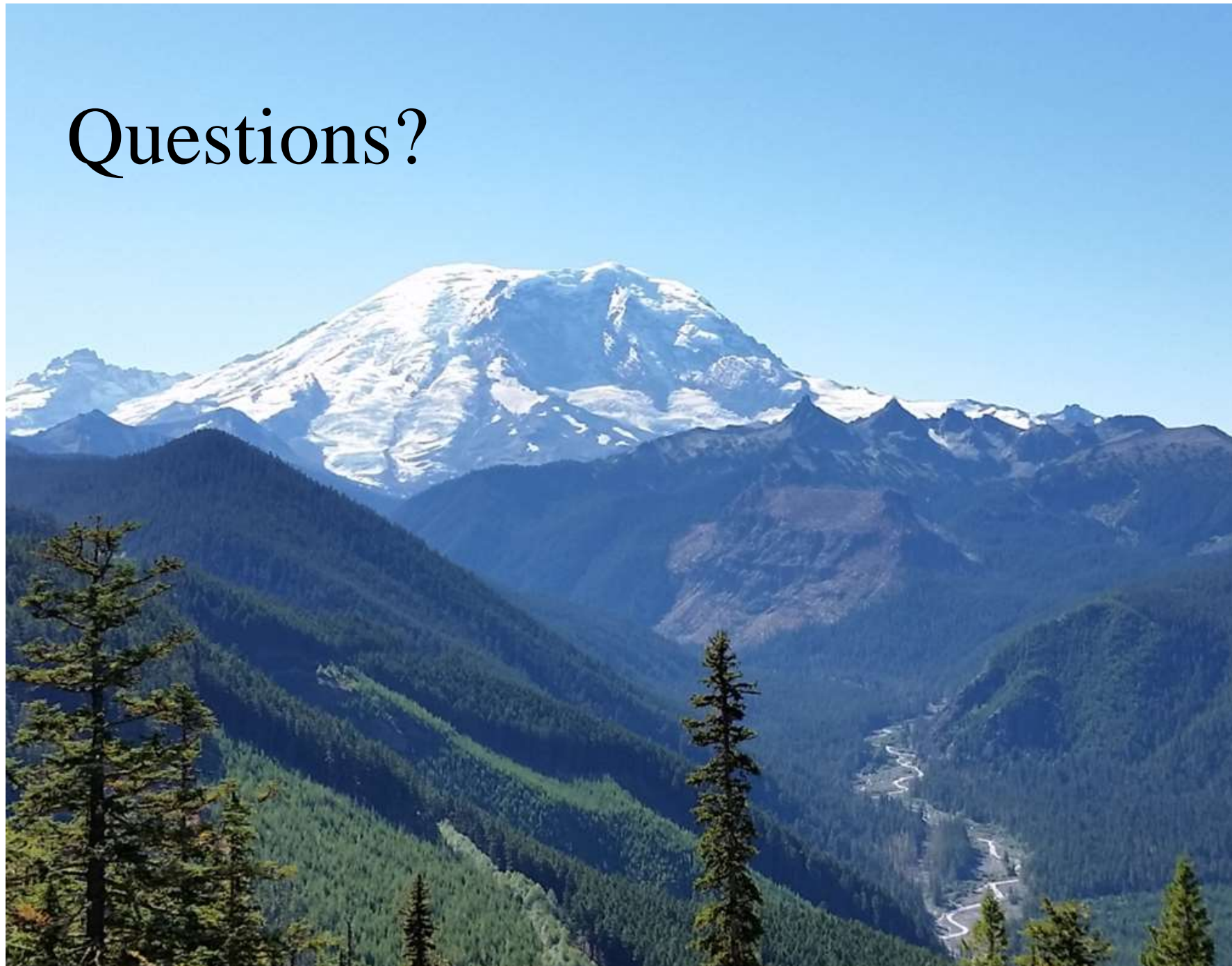
Andrew Berger

SPSSEG

Kristin Williamson



Questions?



Movement Timing

- Boundary detected 93.3% of all BD tagged fish detected in 2018.
- 18 known upstream migrants
 - July 3 – Sept. 21; Mean Aug. 16
- 28 known downstream migrants
 - Sept. 15 – Oct. 26; Mean Oct. 3
- 12 fish with known upstream and subsequent downstream migration
 - 15-92 days, Mean 53 days