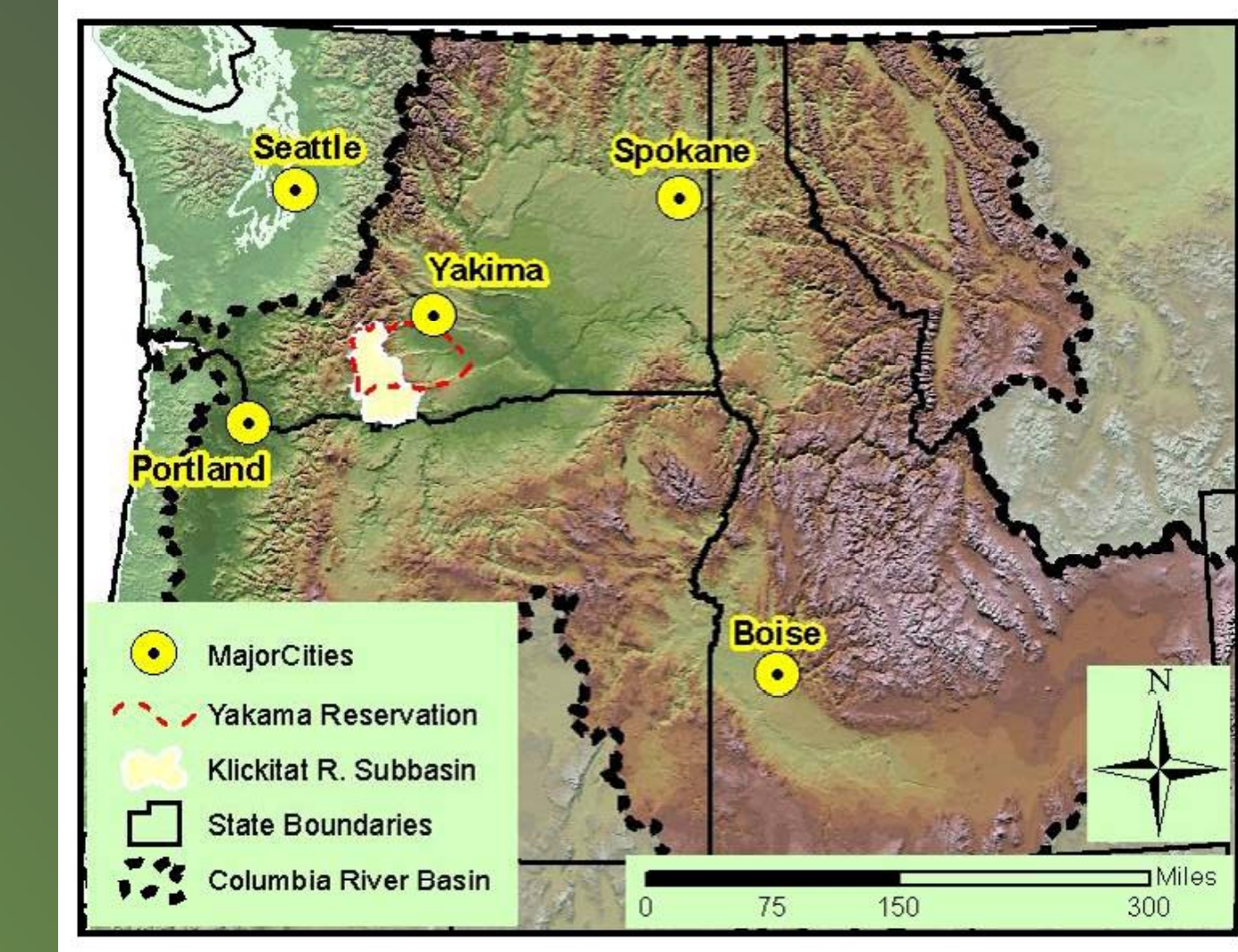


Rapid Aquatic Habitat Assessment Protocol (RAHAP)

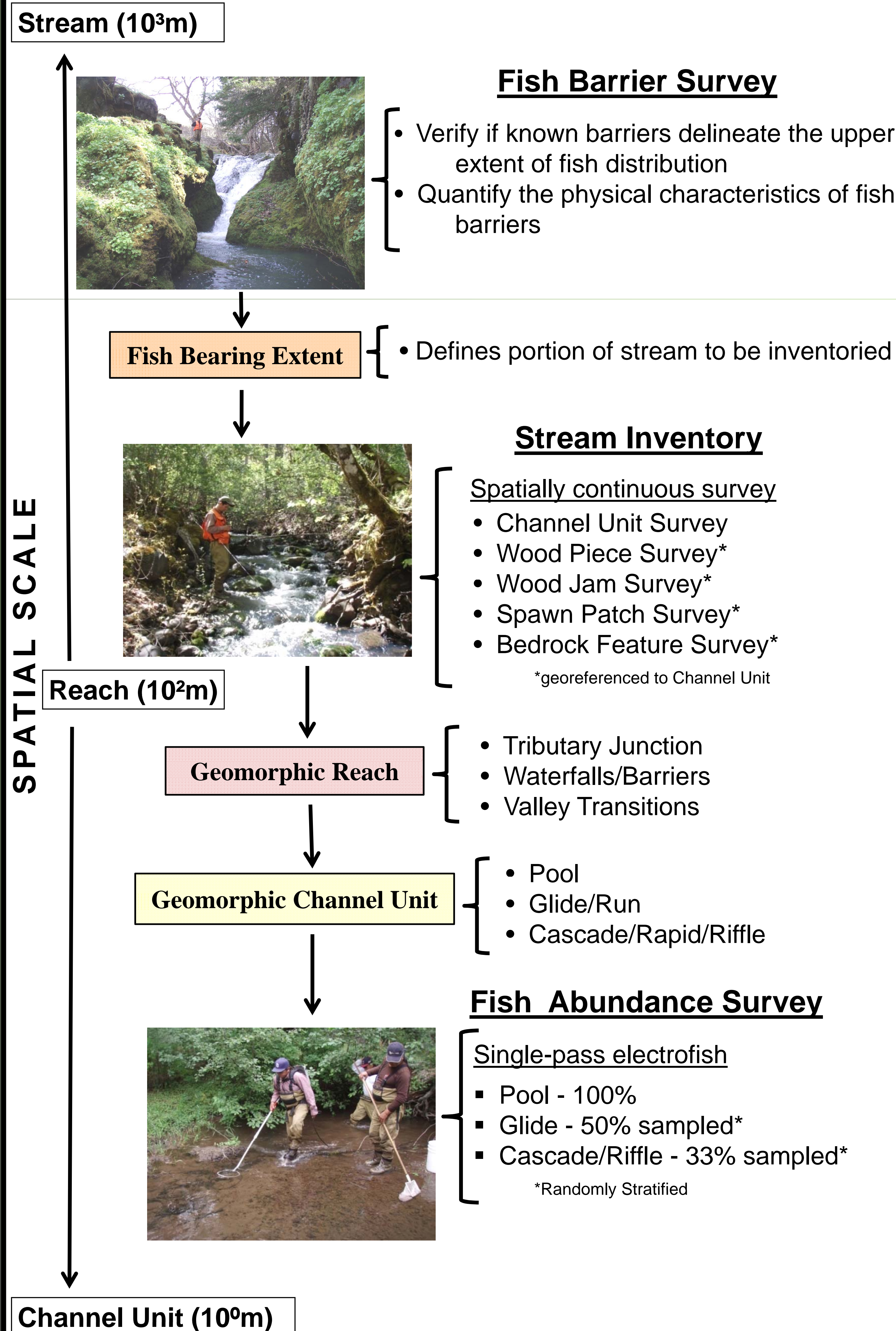
David Lindley, Nicolas Romero, and Will Conley
Yakama Nation Fisheries Program

RRNW - Stream Restoration Design Symposium
January 31 – February 2, 2012



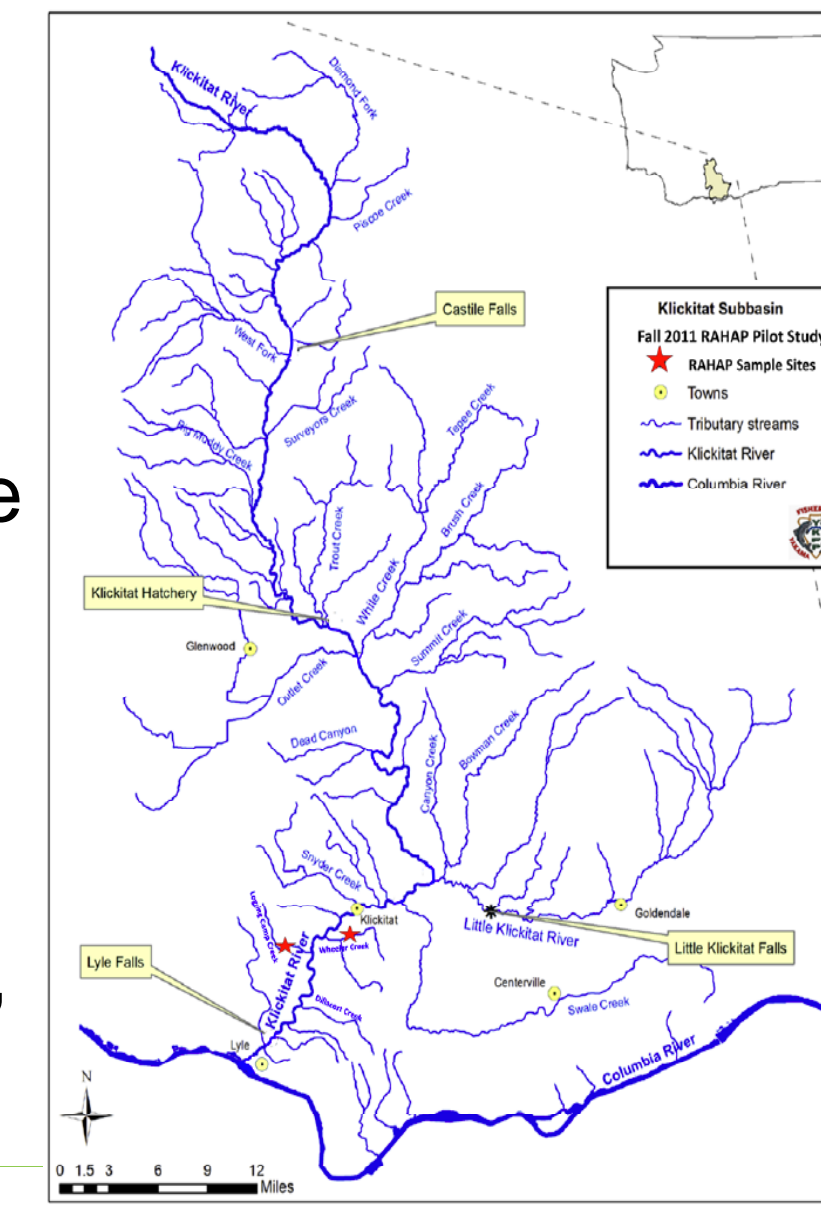
Yakama Nation Fisheries Program staff in the Klickitat subbasin designed a rapid stream inventory protocol for spatially continuous sampling of stream habitat and fish distribution, called Rapid Aquatic Habitat Assessment Protocol (RAHAP). This protocol establishes spatial context and fish habitat relationships at the channel unit, reach, and basin scales. The spatially continuous method is particularly useful when the scale(s) necessary to detect pattern are unknown. This level of pattern detection informs study designs, enhancement project location identification, prioritization, and reference conditions.

RAHAP Methodology



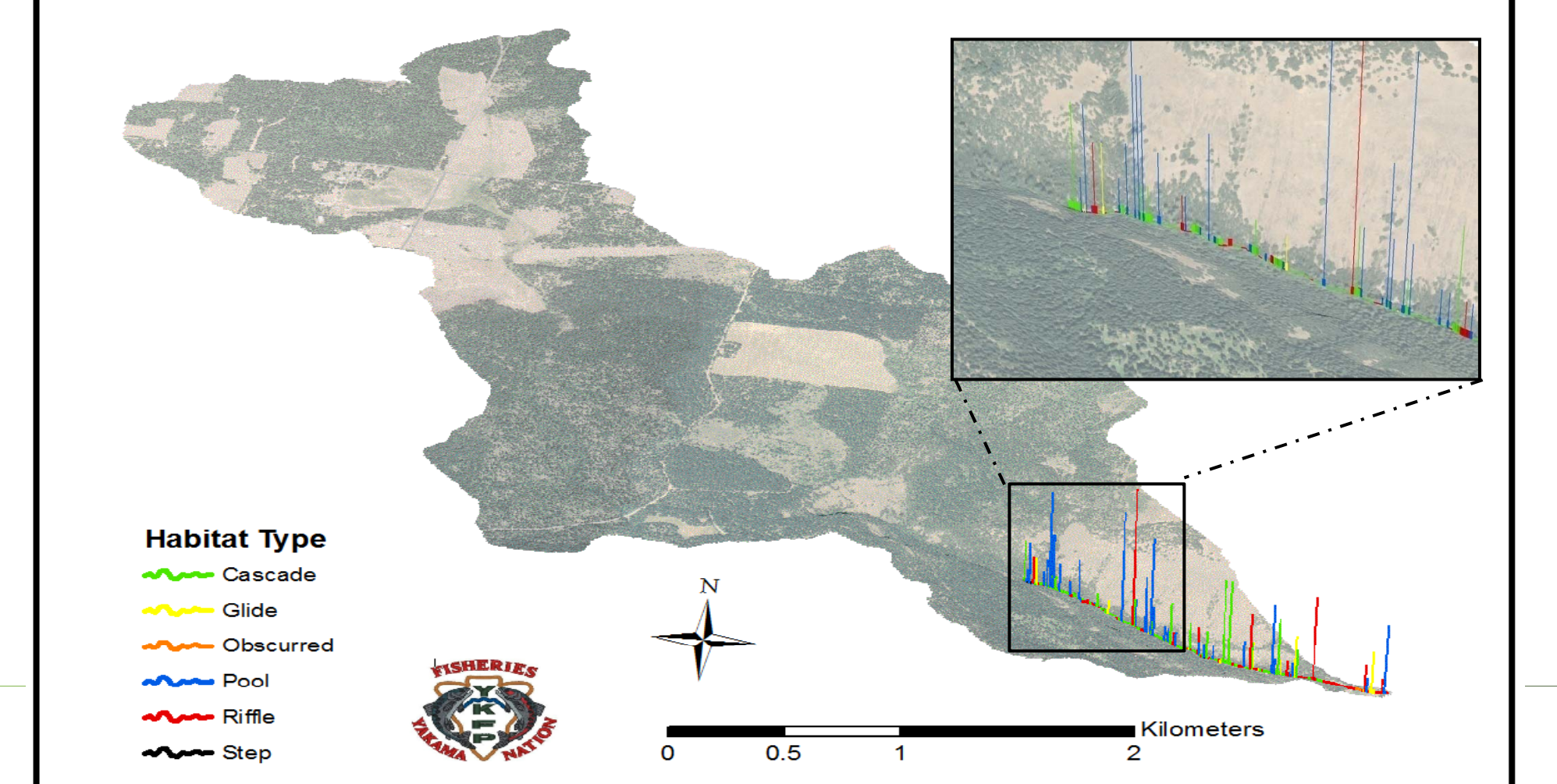
Study Area

A Pilot Study of the RAHAP sampling methodology was initiated in the Spring of 2011. Four watersheds within the Klickitat Sub-basin were selected based on their geographic proximity to one another and the limited amount of existing fish-habitat data. Of these four sampled watersheds, two are presented here, Logging Camp and Wheeler Creeks. These two watersheds exhibit two types of physical settings (vegetation, geology, and hydrology) present in the Klickitat basin.

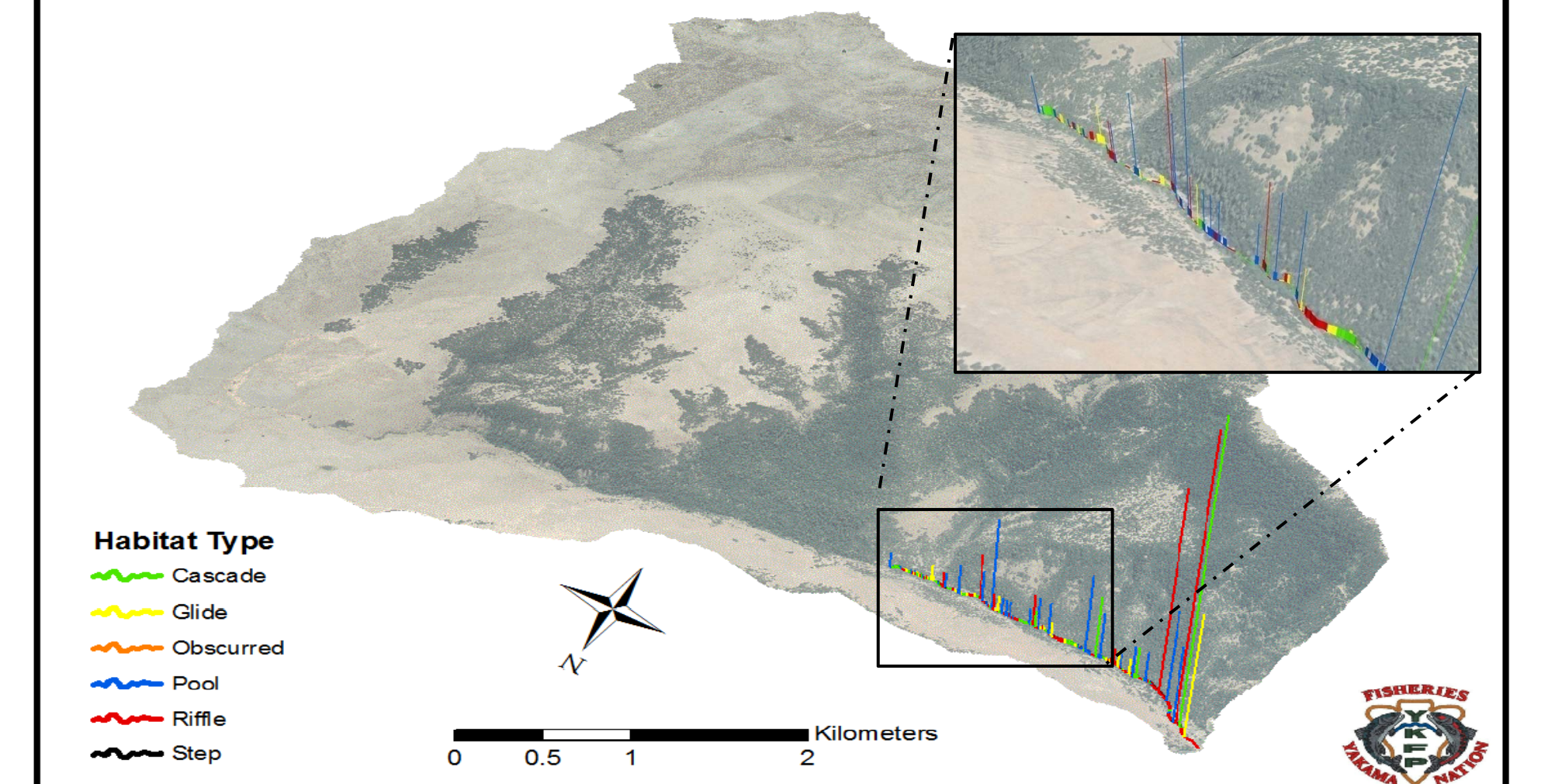


Products

Oncorhynchus mykiss Abundance by Habitat Type: Logging Camp Creek



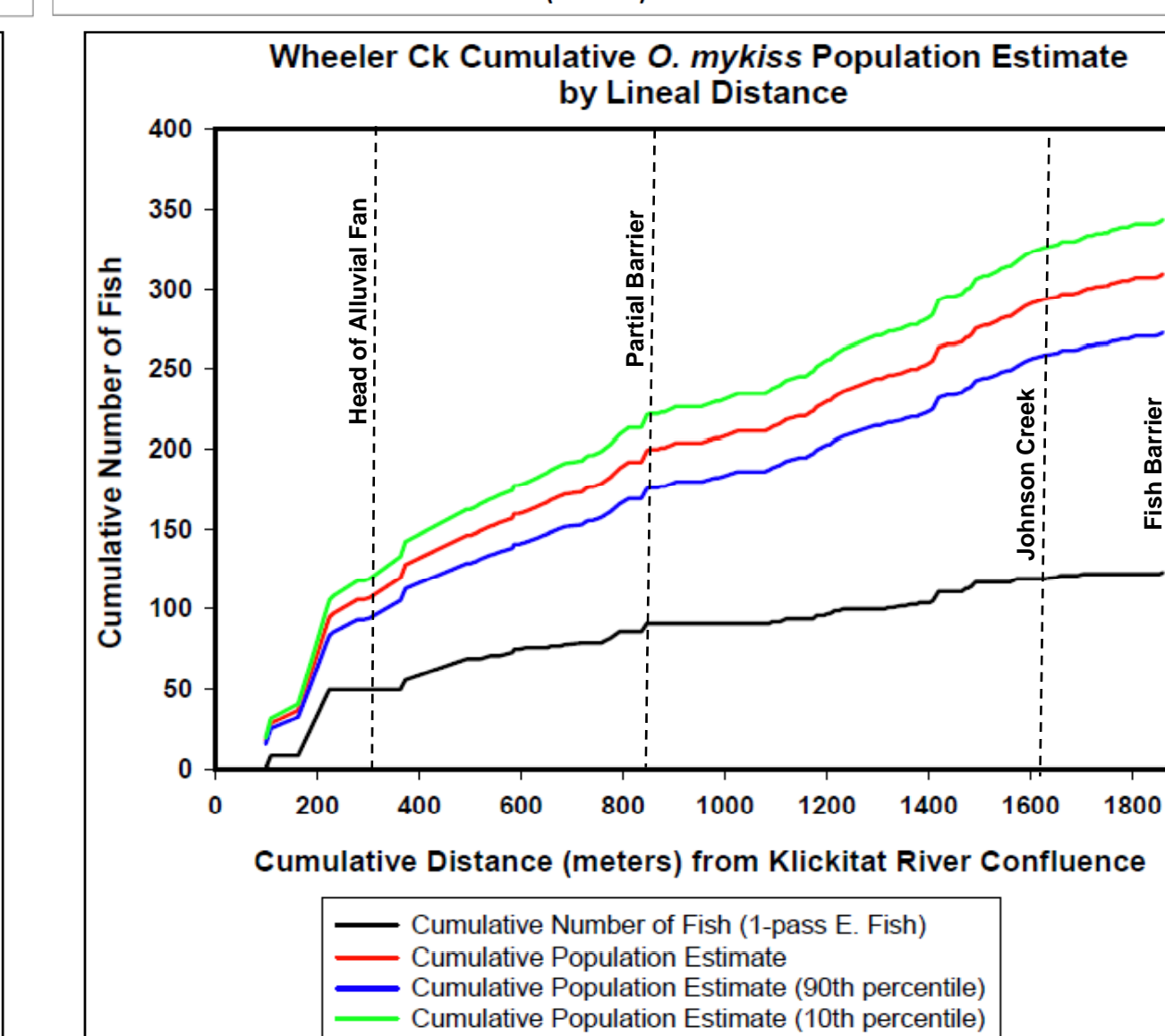
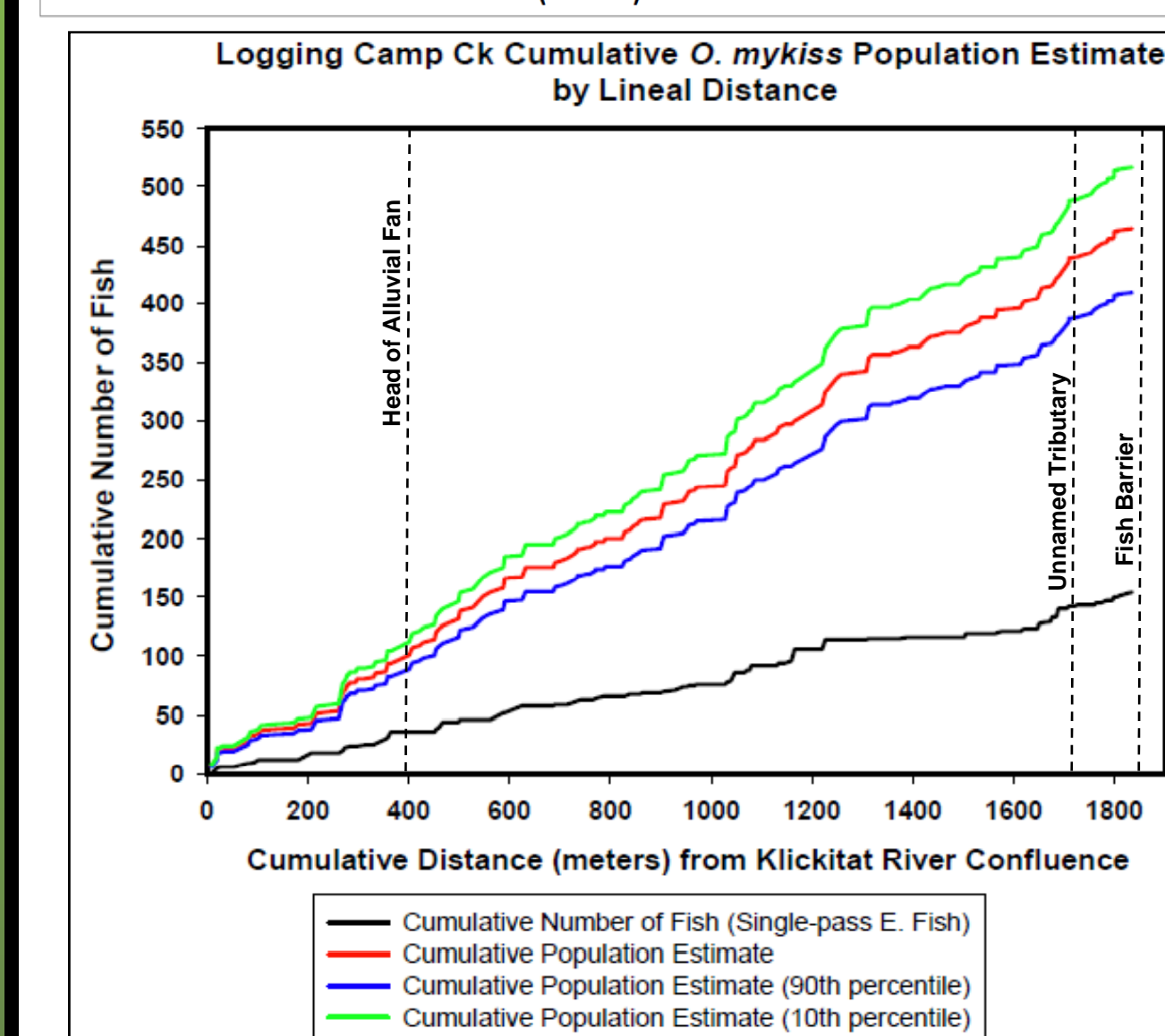
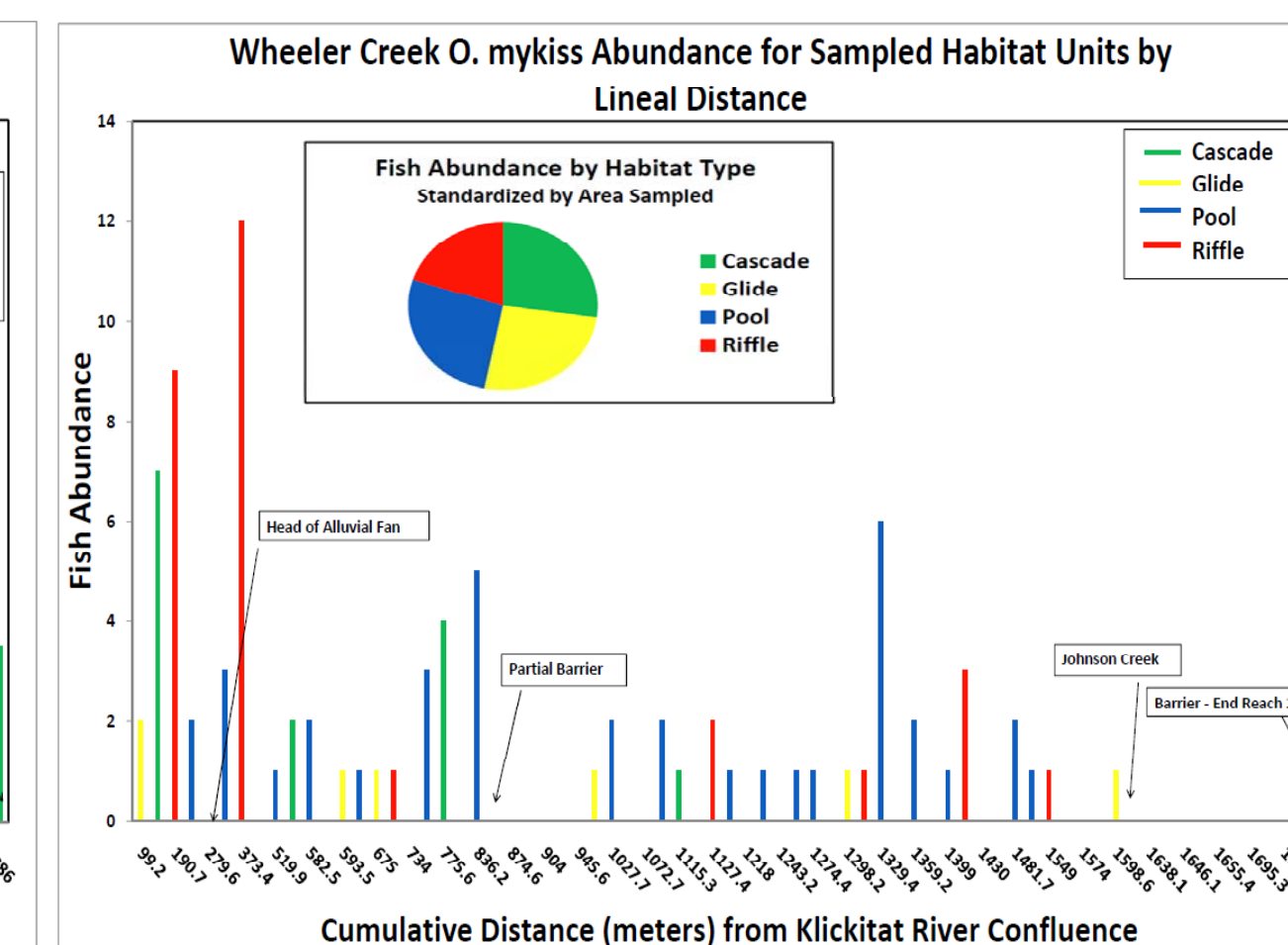
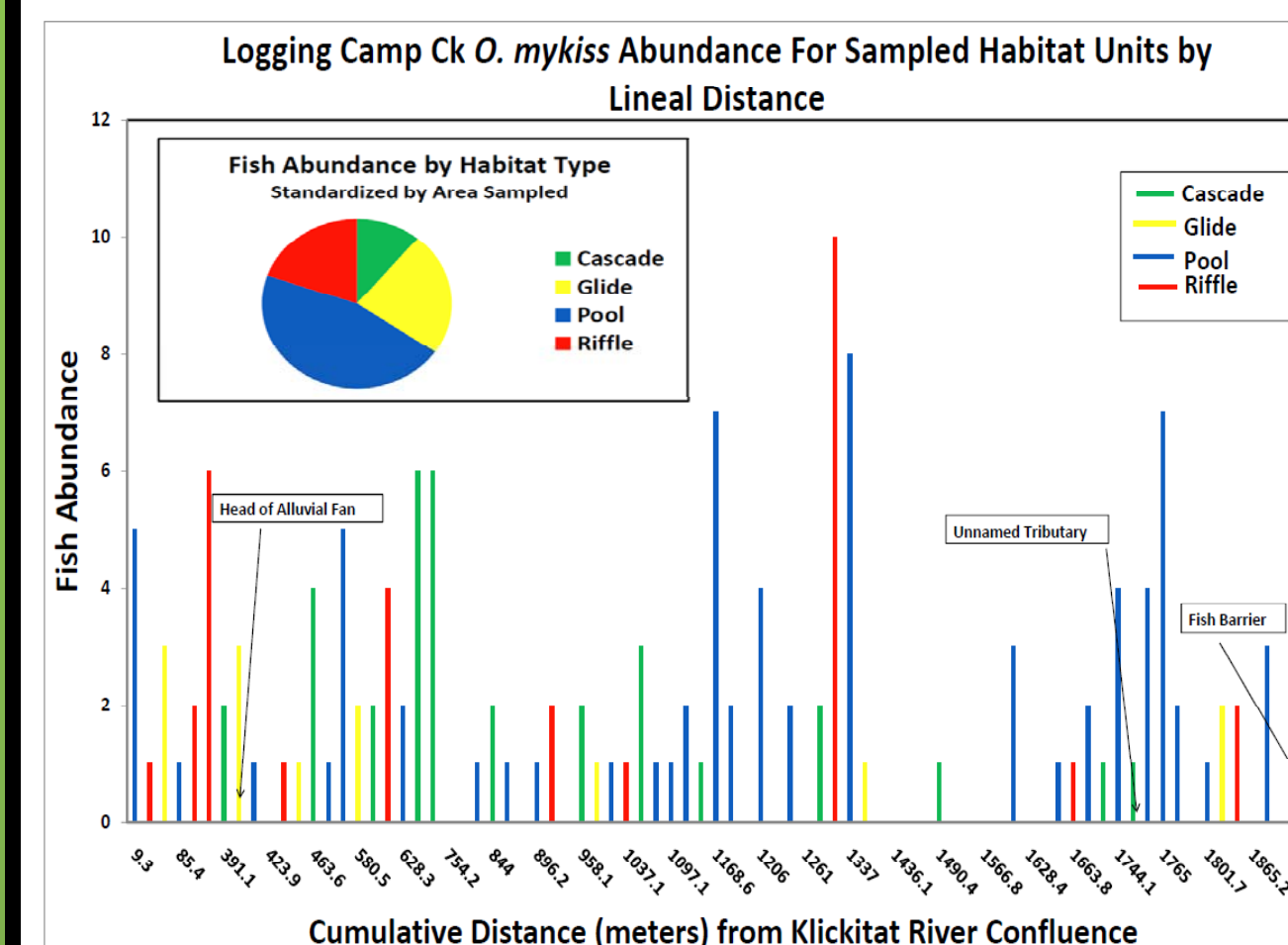
Oncorhynchus mykiss Abundance by Habitat Type: Wheeler Creek



Results

Watershed Characteristics of Logging Camp and Wheeler Creeks

	Logging Camp Ck	Wheeler Ck
Drainage Area	12.1 km ²	9.7 km ²
Elevation	103-244 m (Sample Area) 103-732 m (Watershed)	116-207 m (Sample Area) 116-671 m (Watershed)
Total Length Surveyed (km)	1.9	1.8
Side Channel Length (m)	58.2	87
Avg. Wetted Width (m)	3.3	4
Avg. Bankful Width (m)	4.5	8.1
Avg. Habitat Unit Area (m ²)	39.1	58.7
Pools per km	20	18
Avg. Max Pool Depth (m)	0.53	0.83
Avg. Residual Pool Depth (m)	0.33	0.51
Total Spawning Area (m ²)	49.8	37.7
Bedrock Outcrops per km	3	17
LWD Pieces per km	49	28
Volume of LWD (m ³) per km	46.13	14.57



Conclusions

- Identified spatial patterns in fish distribution
 - Multiple life histories displayed in seasonally disconnected tributaries
- Characterized physical habitat
 - Lack of LWD (Wheeler Ck)
 - Bedrock primary pool forming factor (Wheeler Ck)
- In seasonal streams, a Fall survey at low water may be necessary to delineate perennial habitat
- Stream Inventory Rate (2-person crew) ~0.5 km per day
- Fish Abundance Survey Rate (2-person crew) ~0.4km per day

Next Steps

- Finalize RAHAP relational database
- Continue sampling Klickitat River tributaries
- Initiate *O. mykiss* Life History Pilot Study in two of the Klickitat River tributaries sampled in 2011 (install PIT tag arrays)
- Conduct RAHAP workshop for YN Personnel in Southern Ceded Lands
- Expand geographic extent of RAHAP to other subbasins