White Salmon River Basin Lamprey Surveys

Christina W. Luzier, Greg Silver and Tim A. Whitesel

USFWS - Columbia River Fisheries

Program Office - Vancouver, WA

Columbia River Basin Lampreys

- Three species native to CRB
  - Pacific lamprey
  - Western brook lamprey
  - River lamprey

Pacific lamprey
Lampetra tridentata

Parasitic and Anadromous

Western brook lamprey
L. richardsoni

Non-parasitic and Resident

River lamprey
L. ayresi

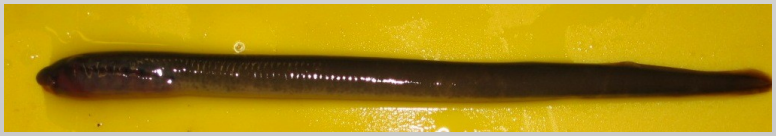
Parasitic and Anadromous

Pacific Lamprey Life Cycle

Egg

Adult

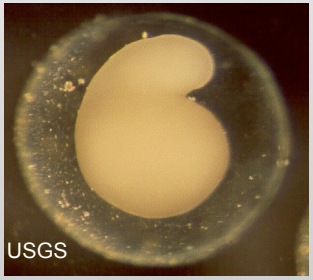
Ammocoete



Macropthalmia

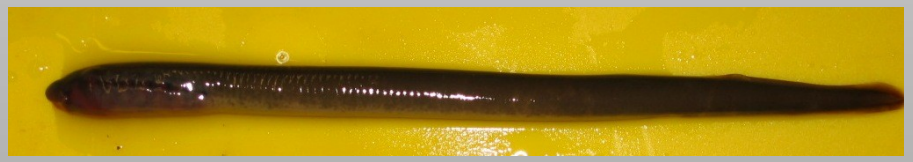
Western Brook Lamprey Life Cycle

Egg



Adult

Ammocoete



Lamprey Status in CRB

Pacific lampreys have declined rangewide and status of western brook and river lampreys is unknown

3. Passage
4. Habitat

Lampreys in White Salmon

- Condit Dam has blocked anadromous fish since 1913
- Pacifics downstream of dam?
- Western brooks in White Salmon?
- Habitat conditions?
- Impact of dam removal on lampreys?

Objectives

1. Determine pre-dam removal presence of lampreys in White Salmon basin.
2. Determine pre-dam removal condition of habitat for lamprey spawning and rearing.

Species Surveyed

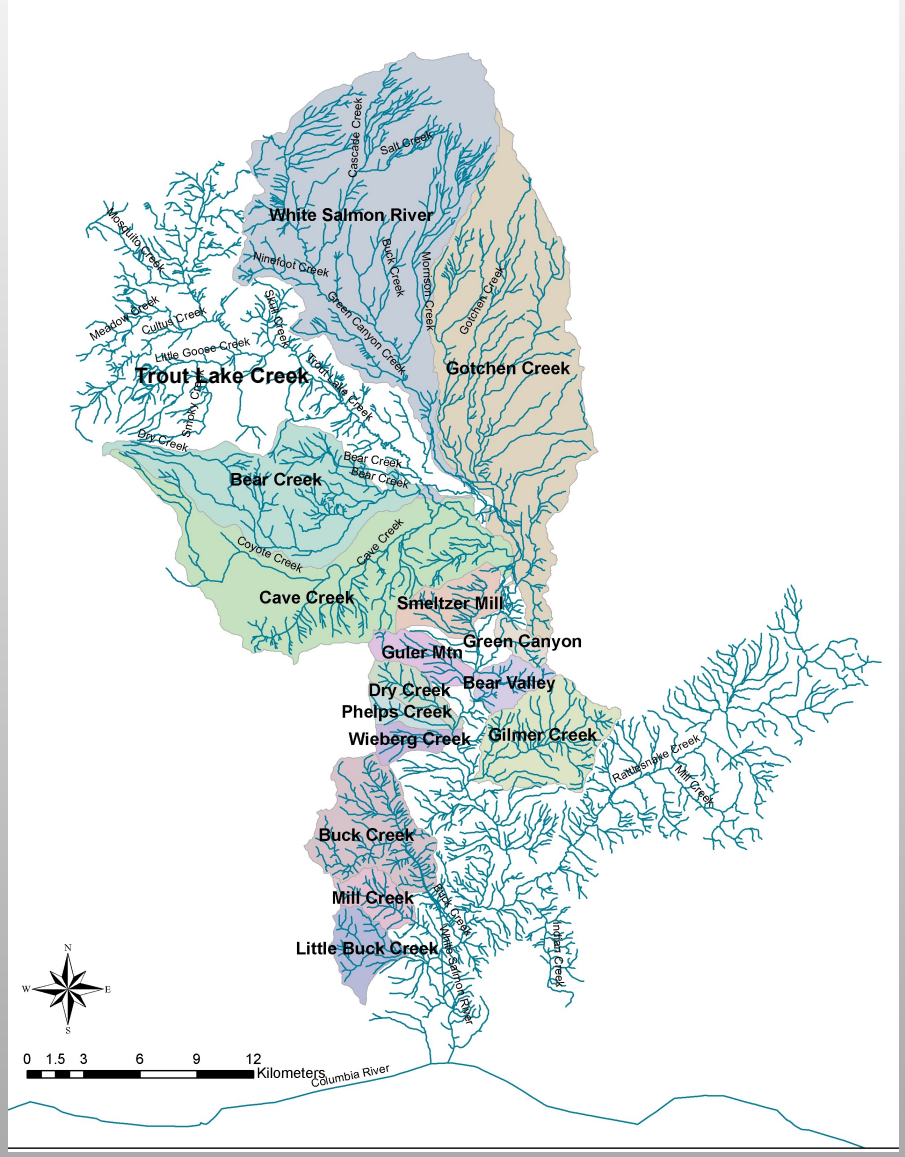
- Lampreys
  - Pacific *(Lampetra tridentata)*
  - Western brook *(L. richardsoni)*
- Mollusks
  - Mussels (Anodonta, Margaritifera, Gonidea)
  - Invasive Bi-valves (Asian Clam, Zebra Mussel)

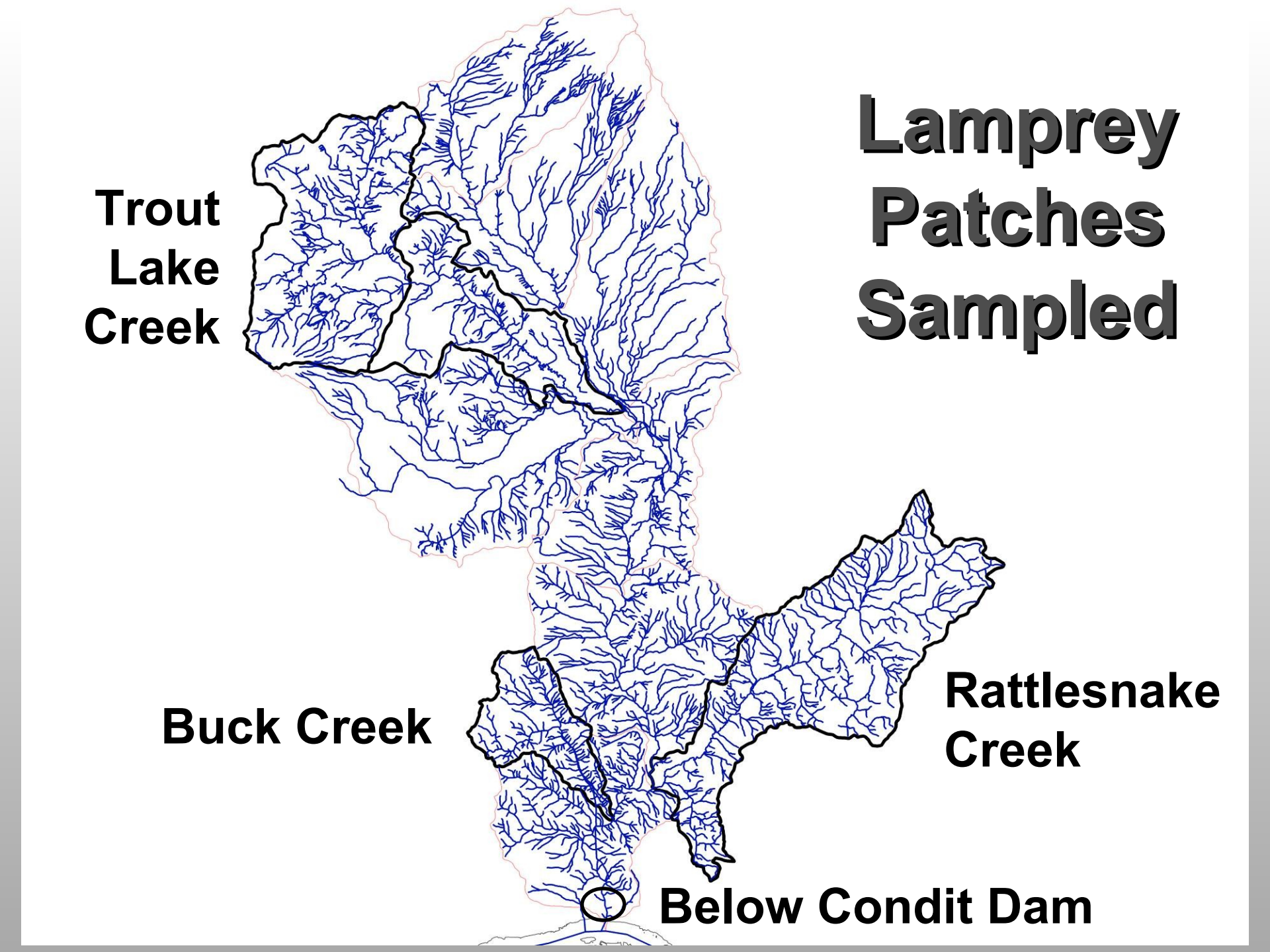
Sampling Site Selection

- Bull Trout patch analysis
  - Temperature - 16°C threshold
  - Elevation relationship with temp.
  - Size - >400 hectares

Bull Trout Patches Sampled

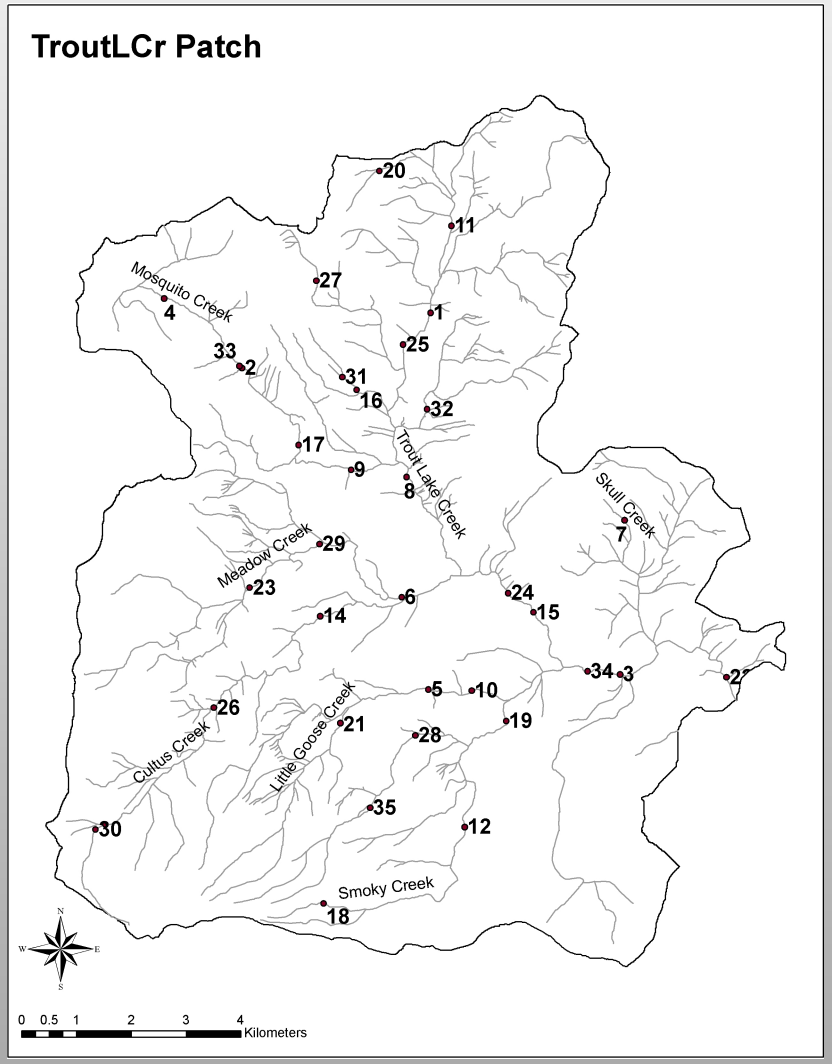
- 5 patches sampled
- “White Salmon River” patch broken into three separate patches
  - Buck Cr
  - Cascade Cr
  - Crofton Cr
- Trout Lake Cr
- Gotchen Cr




Lamprey Patches Sampled
Trout Lake Creek
Buck Creek
Rattlesnake Creek
Below Condit Dam

Sample Design

- EMAP approach to site designation
  - Spatially balanced random sampling design
- Top 21 sites (with water) sampled to determine lamprey presence/absence

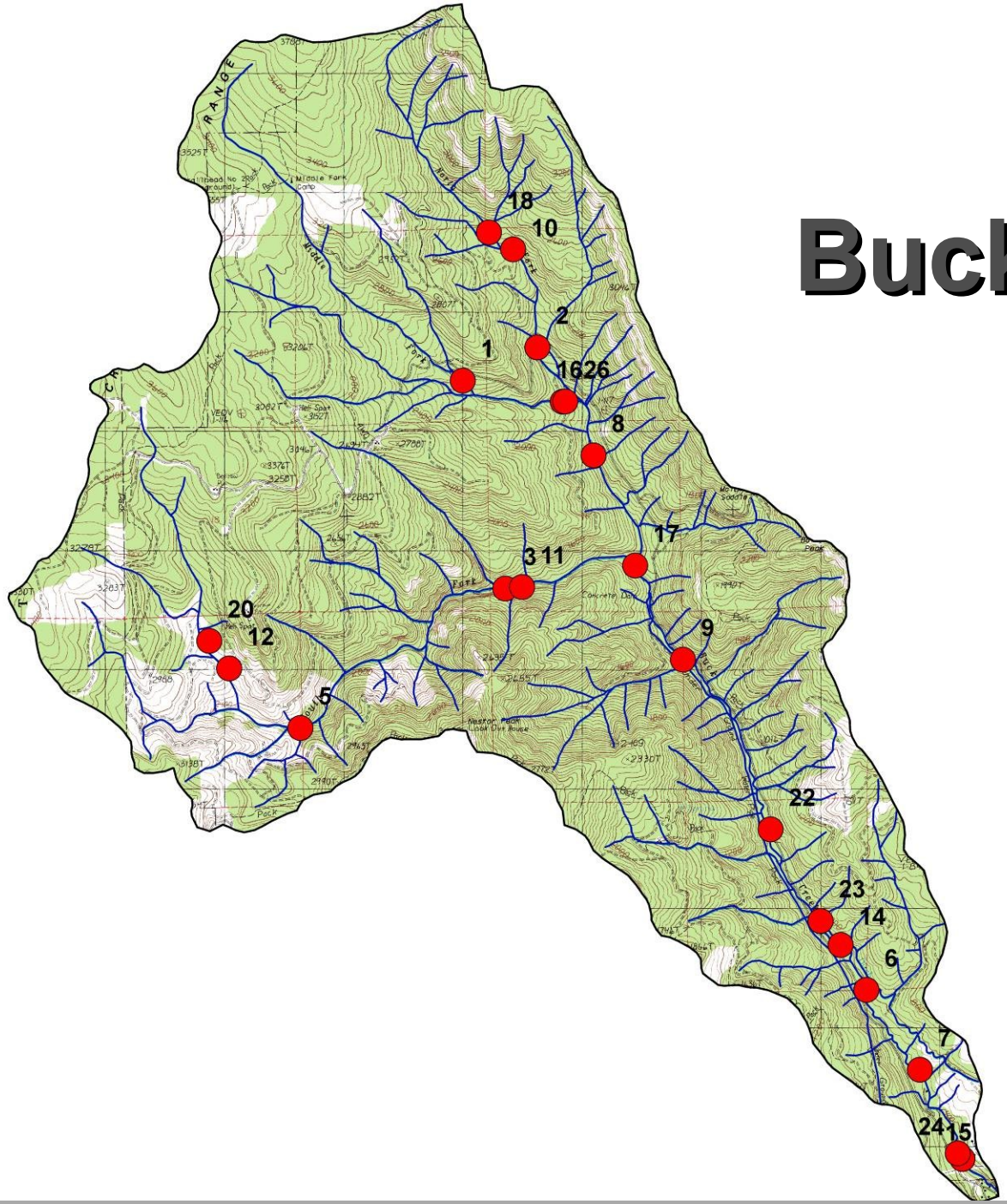


Sampling Approach

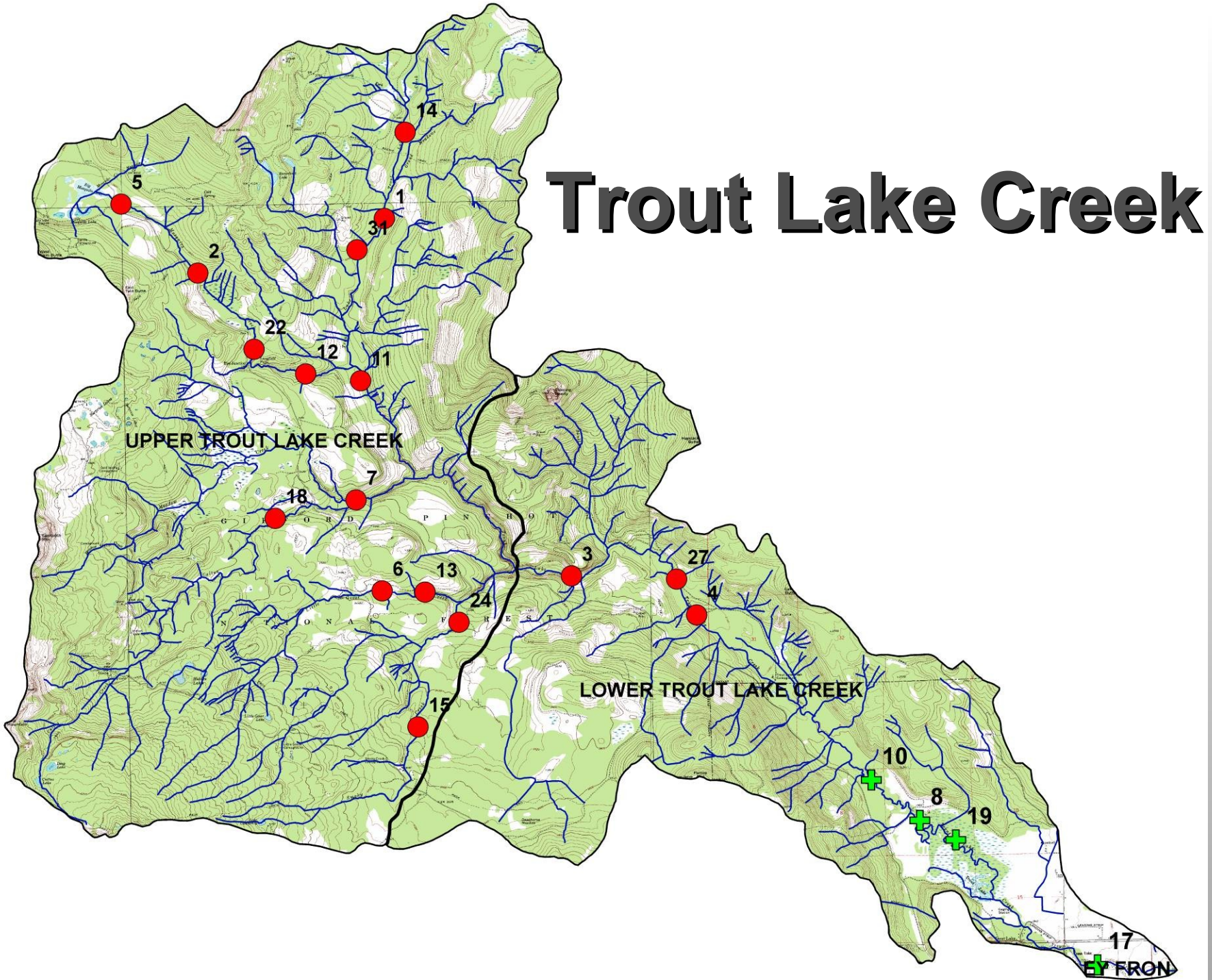
- Biological
  - Electrofish (without block nets) 50 m reach
  - ID, measure, weigh, take genetic sample and release all lamprey
  - ID mollusks
- Habitat
  - Flow
  - Gradient
  - Substrate
  - Channel dimensions
  - Temperature
  - Conductivity

Results

- Pacific lamprey ammocoetes
  - None collected
- Western brook lamprey ammocoetes
  - Trout Lake Cr, Rattlesnake Cr, Below Condit
  - Northwestern Lake
- Unidentified lamprey ammocoetes
  - Below Condit
- Western Pearlshell mussels
  - Rattlesnake Cr

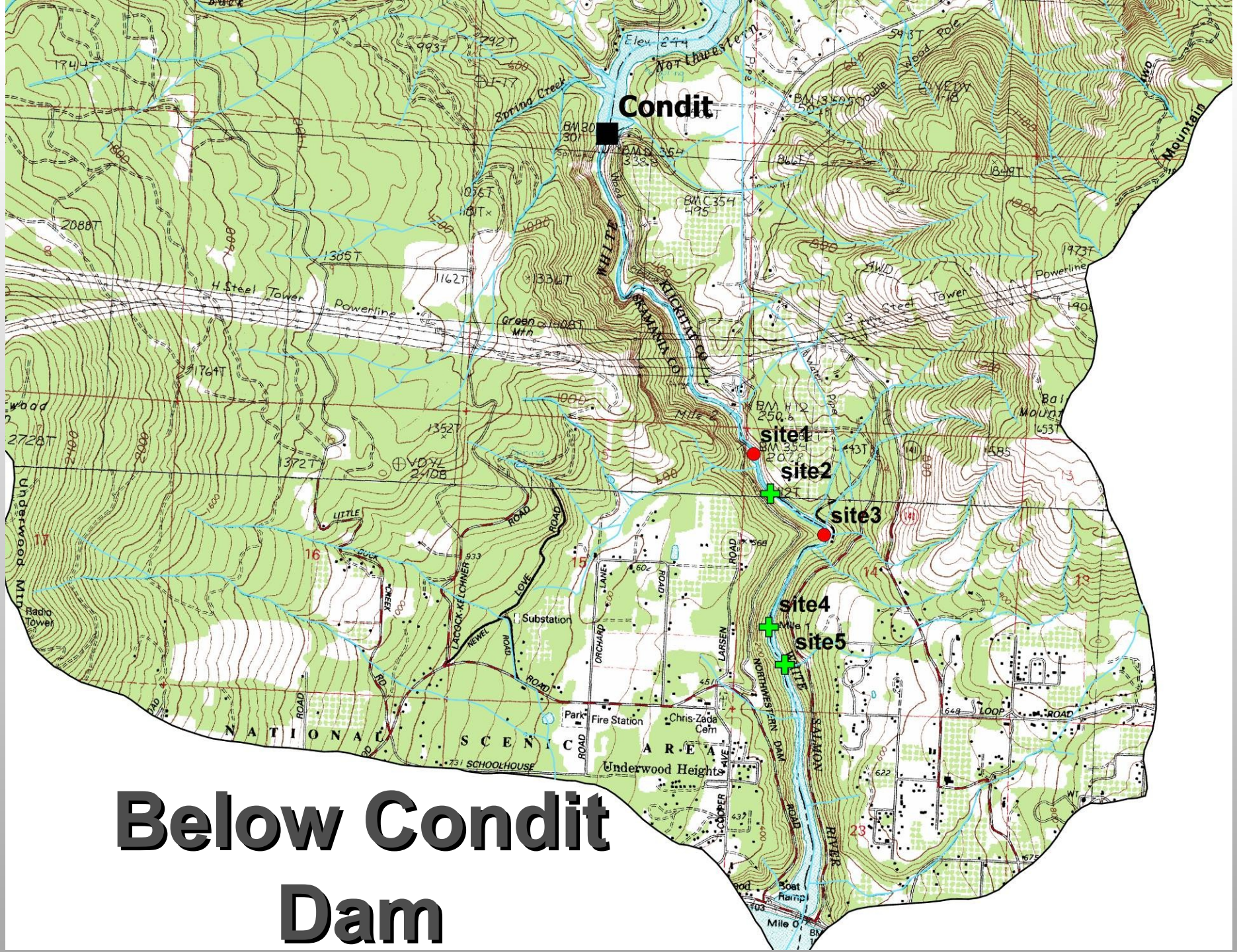


Buck Creek


Trout Lake Creek
UPPER TROUT LAKE CREEK
LOWER TROUT LAKE CREEK
14
5
1
31
2
22
12
11
7
18
6
13
24
3
27
4
15
10
8
19
17

Rattlesnake Creek

And Western Pearlshell mussels



Below Condit Dam

Results

- Suitable habitat for spawning and rearing of both Pacific and western brook lampreys - especially upstream of Condit dam

Trout Lake Creek

Future Plans

- Collect more pre-dam removal data
- Sample after dam is removed
  - Changes in status and habitat
- Study potential return of Pacific lamprey to upper reaches of White Salmon
- Mollusks
  - Sample additional drainages in cooperation with Mussel Workgroup

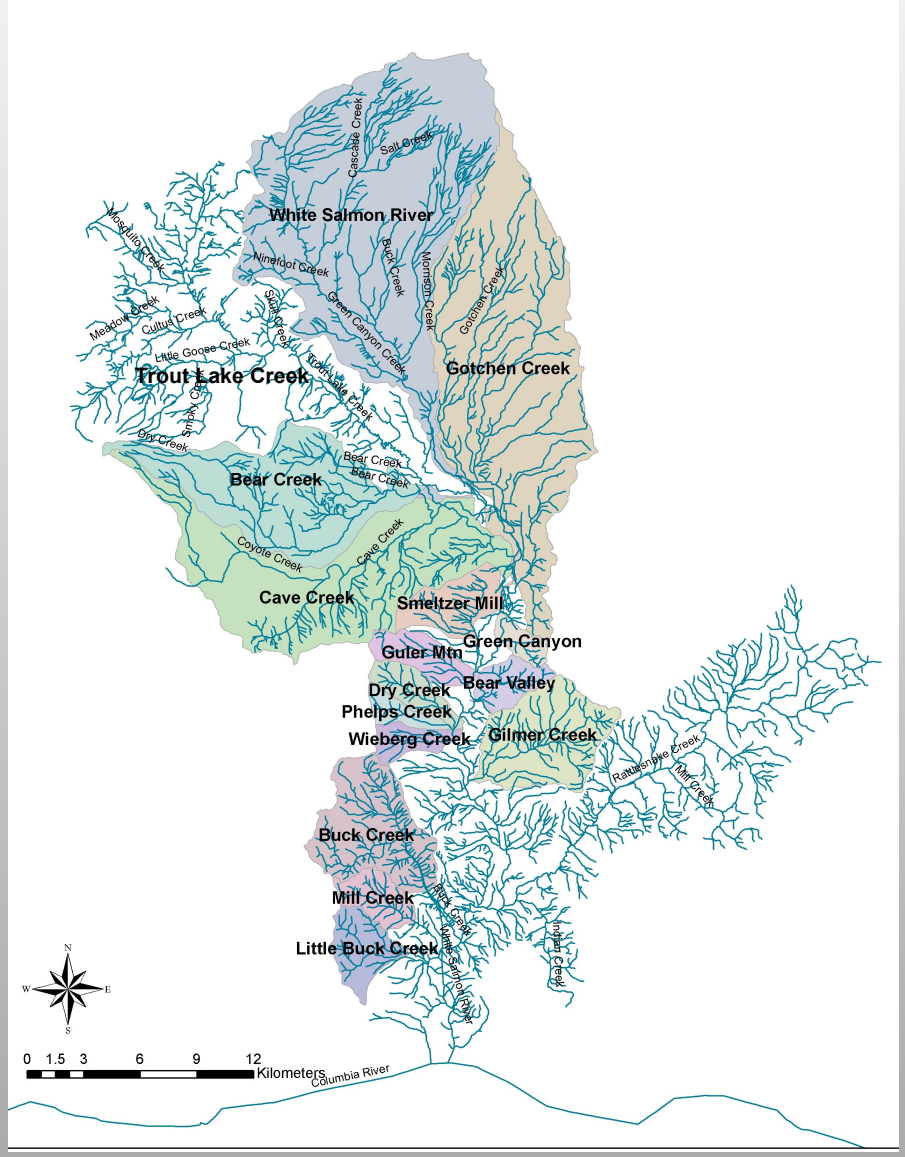
Acknowledgements

- Columbia River Fisheries Office
  - Michael Hudson
  - Howard Schaller
- White Salmon Field Crew
  - Adam Smith
  - Tony Sollars
  - Naomi Worcester
- PacifiCorp
- Yakama Nation

End of presentation – bull trout slides for questions only

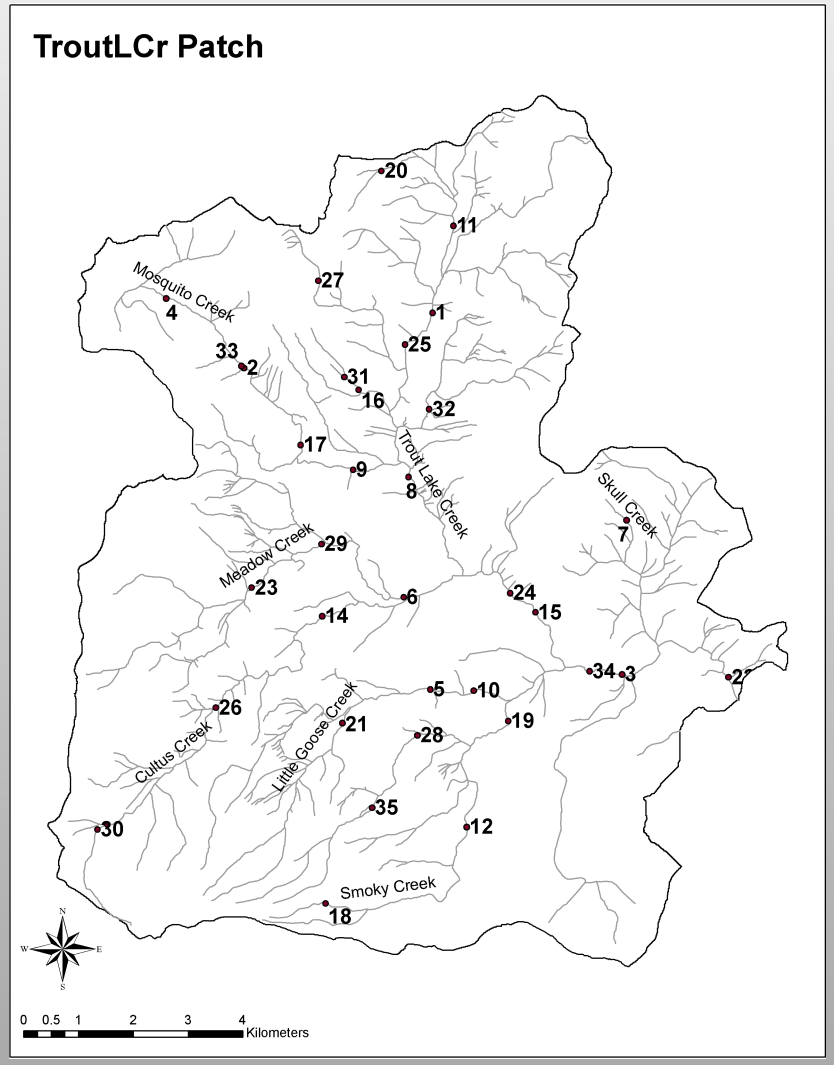
Bull Trout Patches Sampled

- 5 patches sampled
- “White Salmon River” patch broken into three separate patches
  - Buck Cr
  - Cascade Cr
  - Crofton Cr
- Trout Lake Cr
- Gotchen Cr



Bull Trout Sample Design

- EMAP approach to site designation
  - Spatially balanced random sampling design
- Top seven sites (with water) sampled to determine bull trout presence/absence



Bull Trout Sampling Approach

- Biological
  - Electrofish (without block nets) 50 m reach
  - ID, measure, weigh and release all fish captured
- Habitat
  - Gradient
  - Channel dimensions
  - Woody debris
  - Undercut banks
  - Temperature
  - Conductivity

Bull Trout Results

- No bull trout collected
- Trout Lake Cr patch – rainbow trout and brook trout collected
- All other patches – no fish collected