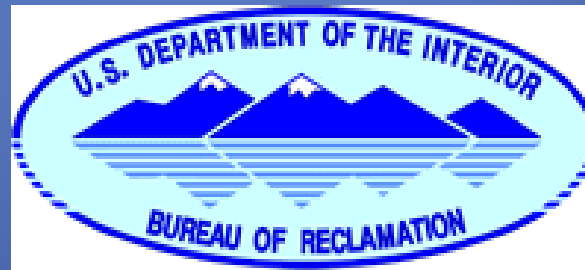


# NF Tieton Bull Trout Transport Project

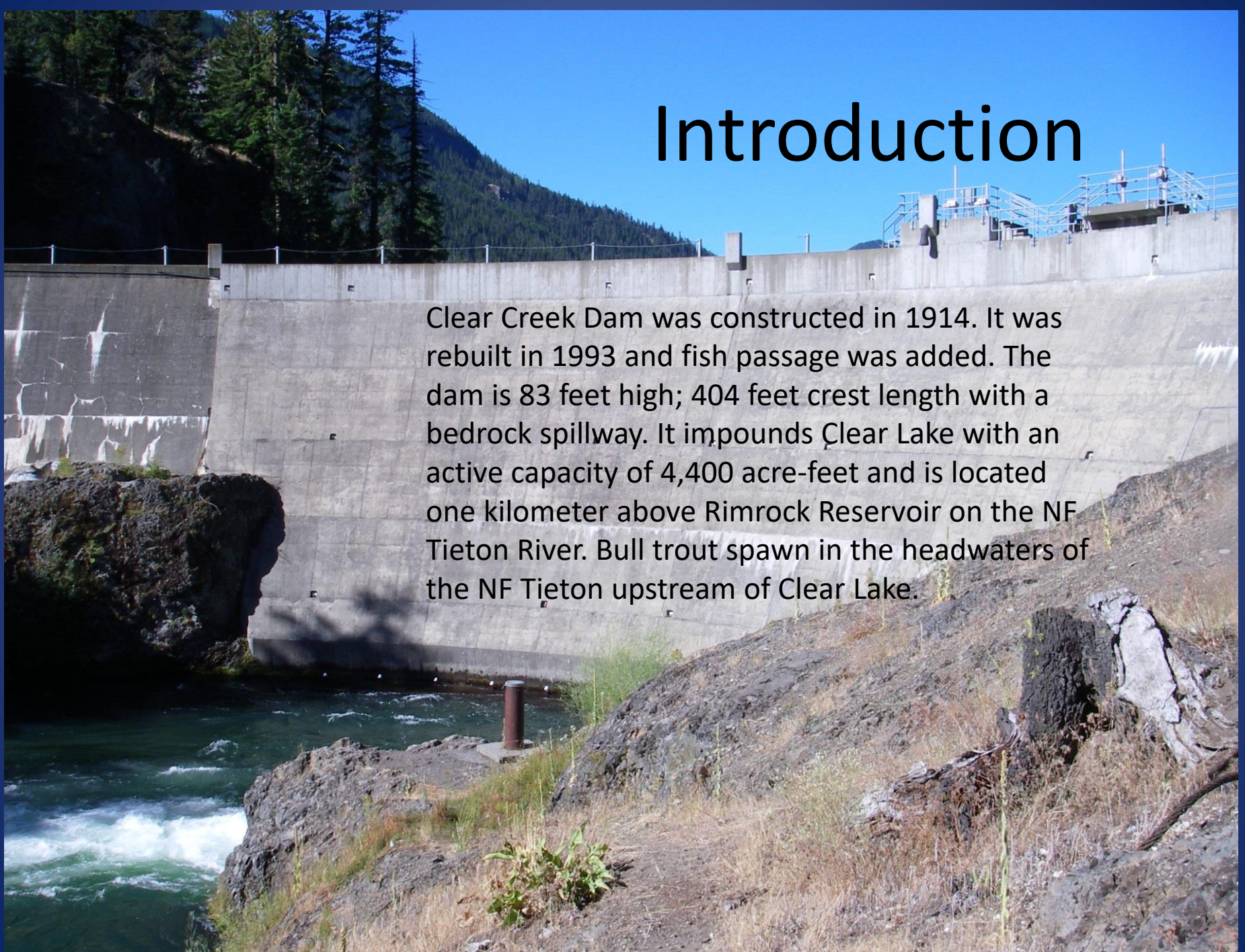
2016

Jeff Thomas, Pat Monk, Rob Randall  
Yakima River Basin Water Enhancement Project

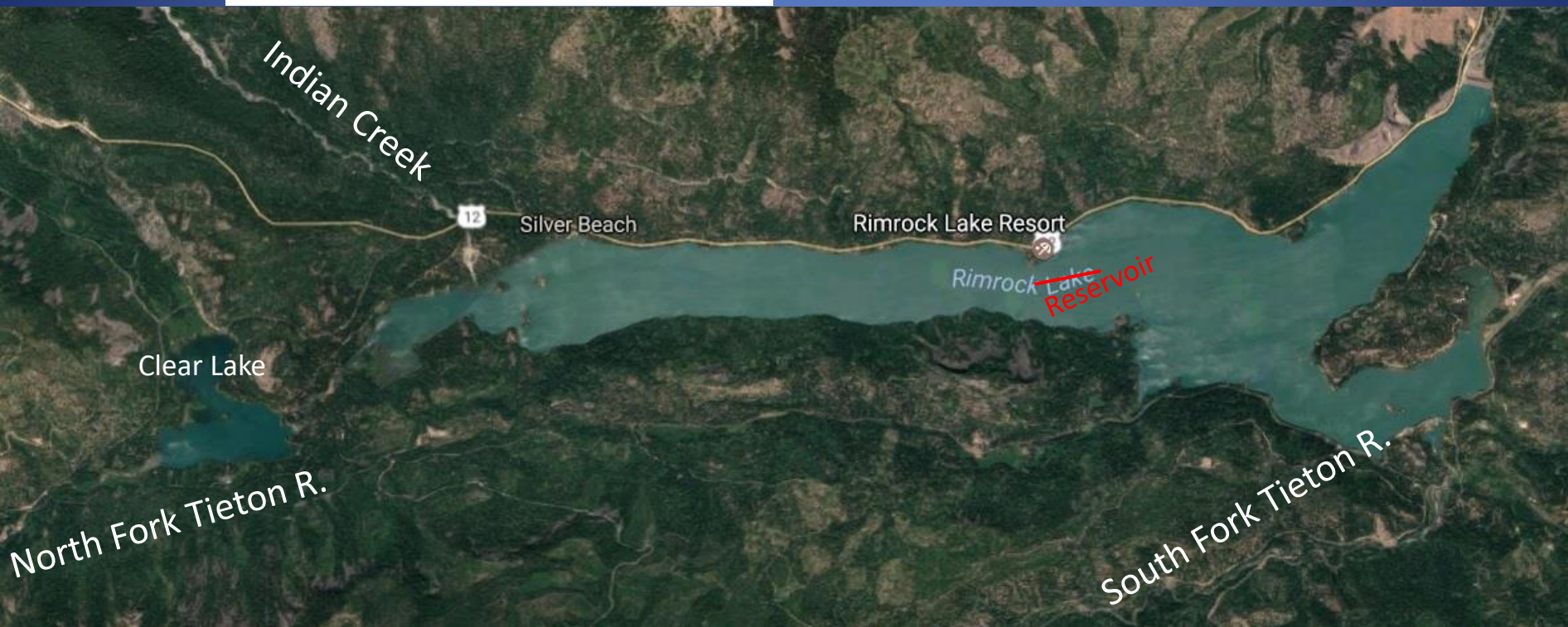
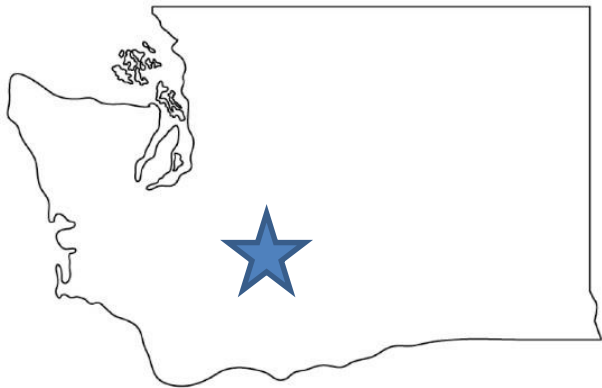


# Introduction

Clear Creek Dam was constructed in 1914. It was rebuilt in 1993 and fish passage was added. The dam is 83 feet high; 404 feet crest length with a bedrock spillway. It impounds Clear Lake with an active capacity of 4,400 acre-feet and is located one kilometer above Rimrock Reservoir on the NF Tieton River. Bull trout spawn in the headwaters of the NF Tieton upstream of Clear Lake.



Washington



World



NF-740

NF-744

NF-745

NF-745

NF-740

100 feet

25 m





# Review of 2012-2015 Passage Assessment

- Adult Bull Trout PIT-tagged above and below Clear Creek Dam, monitored for movement
- 27 of the 29 fish tagged above dam were detected in subsequent years of the study. Four fish were confirmed to have migrated downstream of Clear Lake after spawning
- 22 fish were tagged below the dam. 19 genetically NF Tieton. One hybrid, one SF Tieton, one Indian Ck
- Bull Trout appeared unable to ascend the spillway channel, as **seven unique bull trout** were unsuccessful in 24 attempts over the course of 20 different days



The ultimate goal of this project is to maintain the genetic diversity and population fitness of the NF Tieton Bull Trout population by providing passage to natal spawning habitat.



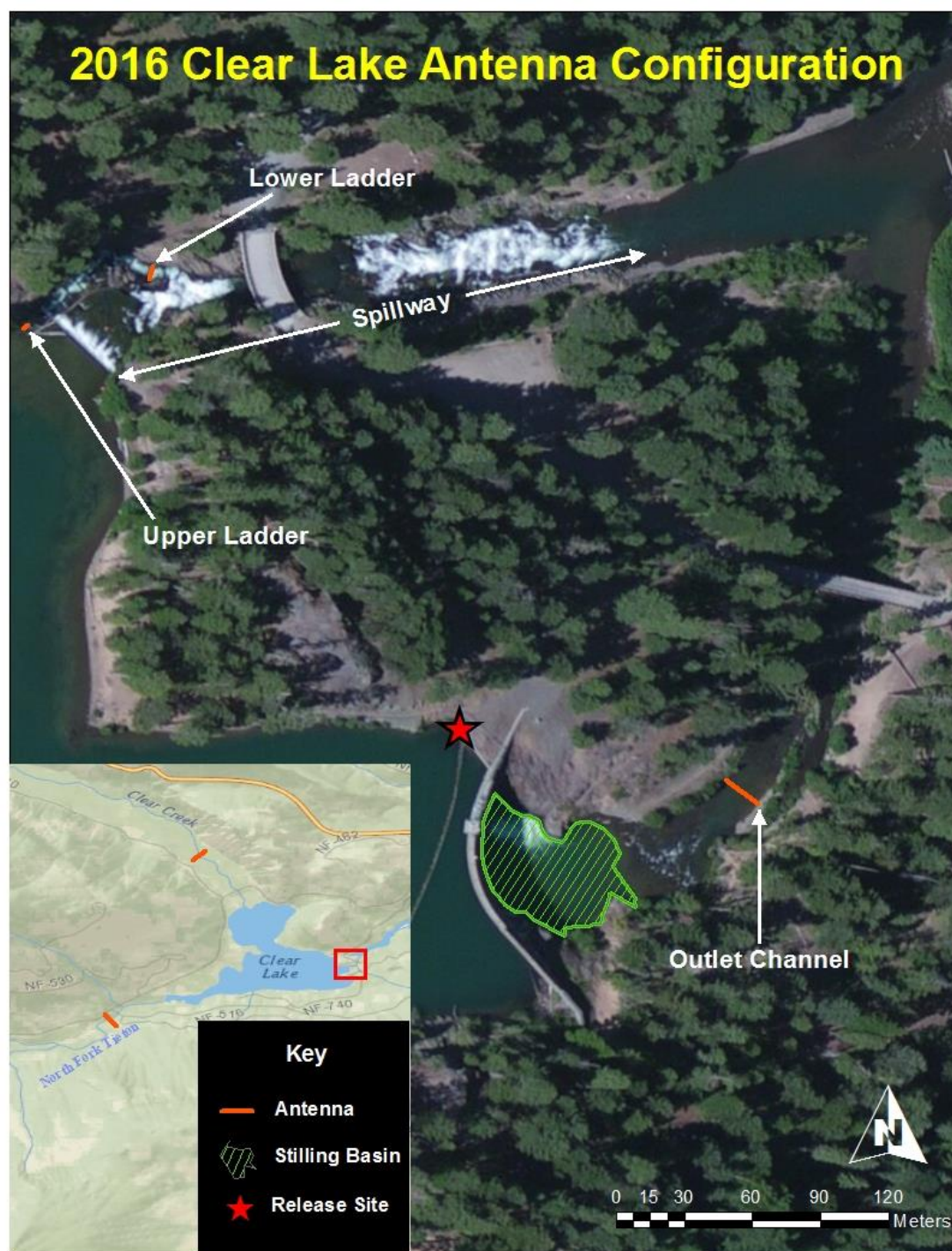
# 2016 Trap and Transport Study Objectives

- Capture adult bull trout by hook-and-line directly below Clear Creek Dam
- Tag the fish with HDX PIT tags and collect genetic samples
- Transport adult bull trout above the dam
- Monitor movements of the fish in the NF Tieton watershed
- Assess the spawning success of transported fish

# 2016 Sampling

- Sampling was conducted weekly beginning July 7 and continuing through August 3 (five sample dates)
- On each date except the last, capture efforts began around 9:00 AM and continued for 4-5 hours. The operation was ended when no fish had been caught for an extended period (generally an hour or so)
- On the last sampling date the effort began at dusk and ended after three hours
- Water temperatures in the stilling basin ranged from 9 to 12°C over the sampling period

# 2016 Clear Lake Antenna Configuration





# 2016 Capture Data

- 32 adult bull trout were captured; 14 on the first sampling date and four or five on each date thereafter
- Based on visual inspection it appeared that eight were males and 14 were females; 10 fish were unknown
- The size (TL) of the fish captured ranged from 32.5 – 70 centimeters (average: 49.5 cm)
- Just two of the bull trout caught were recaptures, both tagged below the dam in 2015
- Three rainbow trout, one brook trout and one west slope cutthroat trout were also caught

32.5 cm

July 7



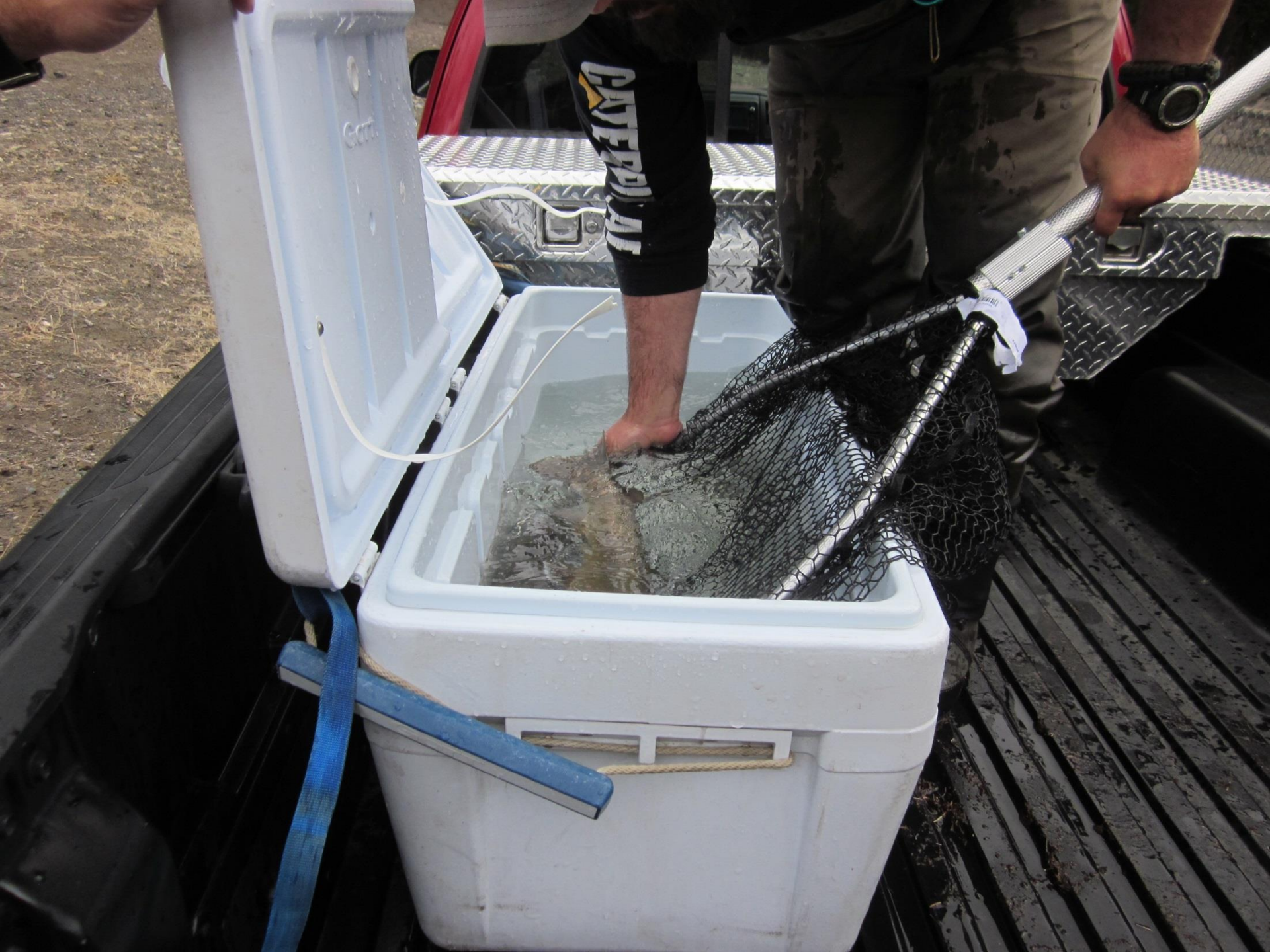


70 cm July 7

# Tagging and Transport

- Thirty fish were new encounters and were PIT tagged
- Thirty fish were transported above the dam including two recaptures from 2015
- Two fish were not transported as markings led us to believe they were brook/bull hybrids. These individuals were released downstream of the dam
- Fish were transported in large coolers filled with fresh cold water. They were transported two or three at a time with each transport run taking less than 10 minutes
- All fish released above the dam were in good condition and immediately headed for deep water









# PIT tag detections

- Eight of the 30 fish transported in 2016 were not subsequently detected. These included the two recaptures from 2015, both genetically confirmed to be NF Tieton Bull Trout
- Of the 22 that were detected, 21 were detected up the NF Tieton River. Thirteen were up the river within four days after release and seven of those were there the next day
- Three of the 21 were detected up both the NF Tieton and Clear Creek with multiple detections in both streams in August and September. All were last detected up the NF in late September/early October
- One fish went to Clear Creek and no where else

## PIT tag detections (cont'd)

Three (possibly 4) of the fish transported, and detected up the North Fork, appear to have migrated back to Rimrock after the spawning period as they were detected at both the upper and lower ladder sites with the lower ladder being the last. Another fish may have left, but lower ladder PIT tag detection efficiency was poor.

# Genetic Analysis

- Genetic analysis completed by Mo Small and Cherril Bowman, WDFW Genetics Lab, indicated that 13 of the 30 fish tagged did not belong to the NF Tieton population. *Prior years data captured predominantly NF Tieton Bull Trout.*
- Five were pure SF Tieton bull trout and eight were from Indian Creek
- The suspected hybrids were *not transported*. However, they were NOT hybrids
- Only one hybrid was captured. It's bull trout genes were from the NF Tieton.



# Where did the 12 foreign transported fish go?

- Five SF Tieton bull trout and two Indian Creek bull trout were not subsequently detected after release
- The other two SF Tieton bull trout were detected up the NF
- All four of the bull trout detected up Clear Creek were Indian Creek fish; three of these were also detected up the NF Tieton
- 3 (possibly 4) bull trout confirmed to have left Clear Lake after the spawning period, two were NF Tieton, and 1 (possibly 2) was an Indian Creek bull trout



MANAGEMENT BRIEF

## Validation of Morphological Characteristics Used for Field Identification of Bull Trout × Brook Trout Hybrids

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*“Genetic analysis of up to three loci suggested hybrids were correctly identified 95% of the time and that no bull trout were mistaken for hybrids. We recommend that field identification of bull trout × brook trout hybrids be based solely on dorsal fin markings.”*



FIGURE 2. Photographs of the dorsal fins of a bull trout, bull trout × brook trout hybrid, and brook trout from Quirk Creek, Alberta, illustrating the differences in fin markings (see morphological characteristic 1 in Methods). [Figure is available in color online.]



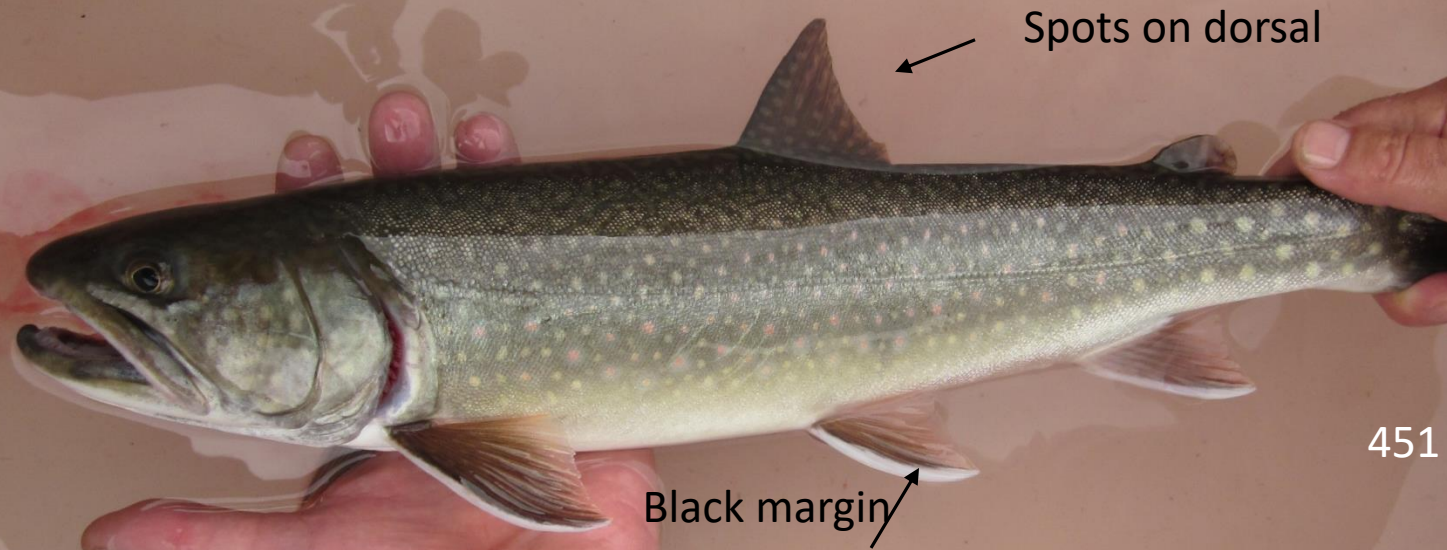
2015 Confirmed Hybrid

# North Fork Tieton Bull Trout

235



# What is it?



North Fork Tieton Bull Trout!

Suspected hybrid




Indian Creek  
Bull Trout!

Transported  
Bull Trout??



Only confirmed hybrid

North Fork Tieton Redd Surveys  
\*complete index area survey 4 km

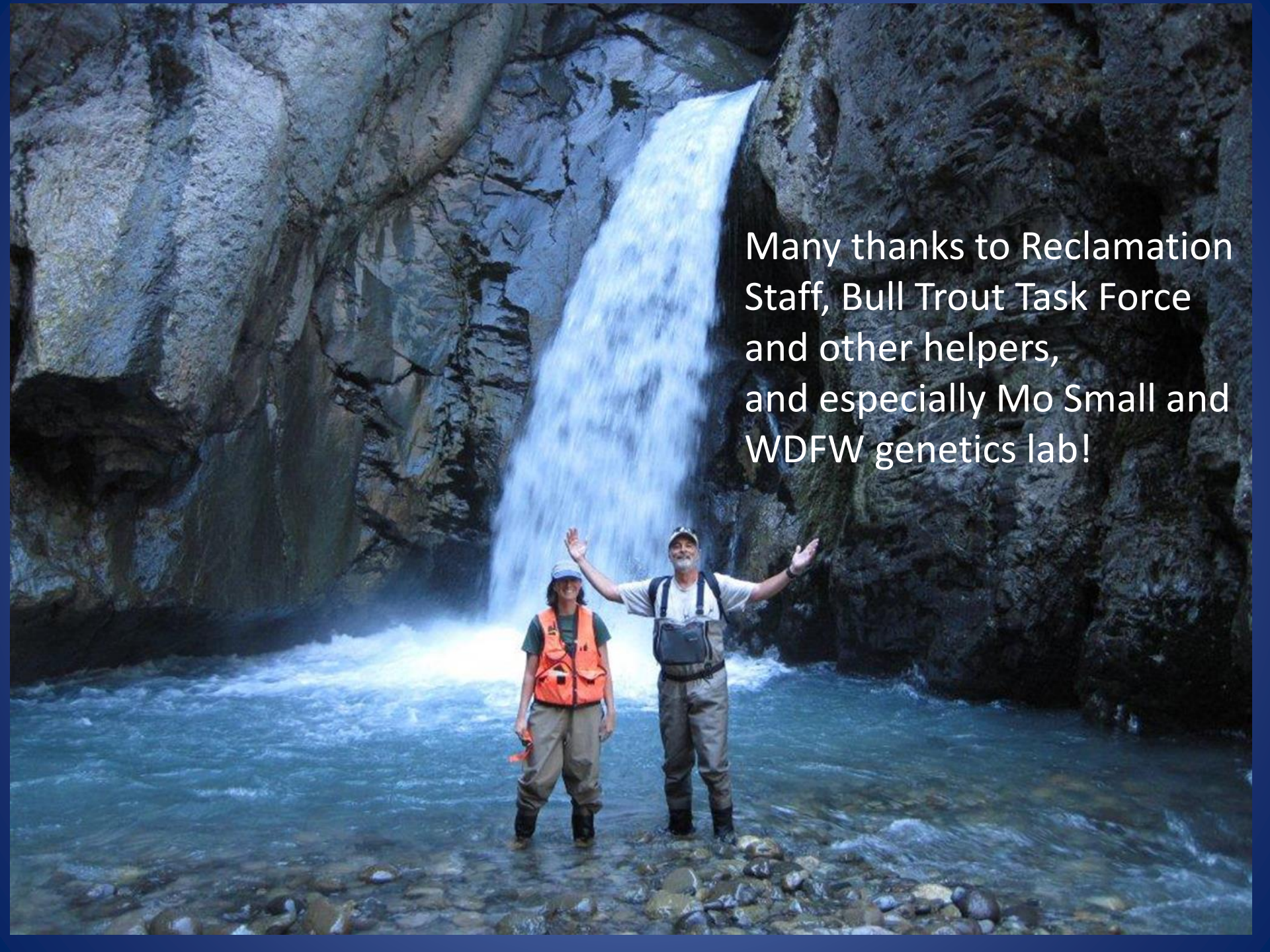


Year	Redds	Redds/km
2007*	37	9.25
2008*	28	7
2009	15	
2010	18	
2011*	11	2.75
2012*	17	4.25
2013	10	
2014	19	
2015*	27	6.75
2016*	21	5.25

# What's Next?

- Considering alternative capture methods
- Rapid genetic assay
- Establishing an index area for redd surveys in the North Fork (if possible)
- Genetic parentage analysis





Many thanks to Reclamation Staff, Bull Trout Task Force and other helpers, and especially Mo Small and WDFW genetics lab!