NF Tieton Bull Trout Transport Project

2016

Jeff Thomas, Pat Monk, Rob Randall

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 past Clear Creek Dam to natal spawning habitat near the headwaters of the NF Tieton River upstream of Clear Lake

Project 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 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; there was not a clear indication as to the sex of the other 10
- 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

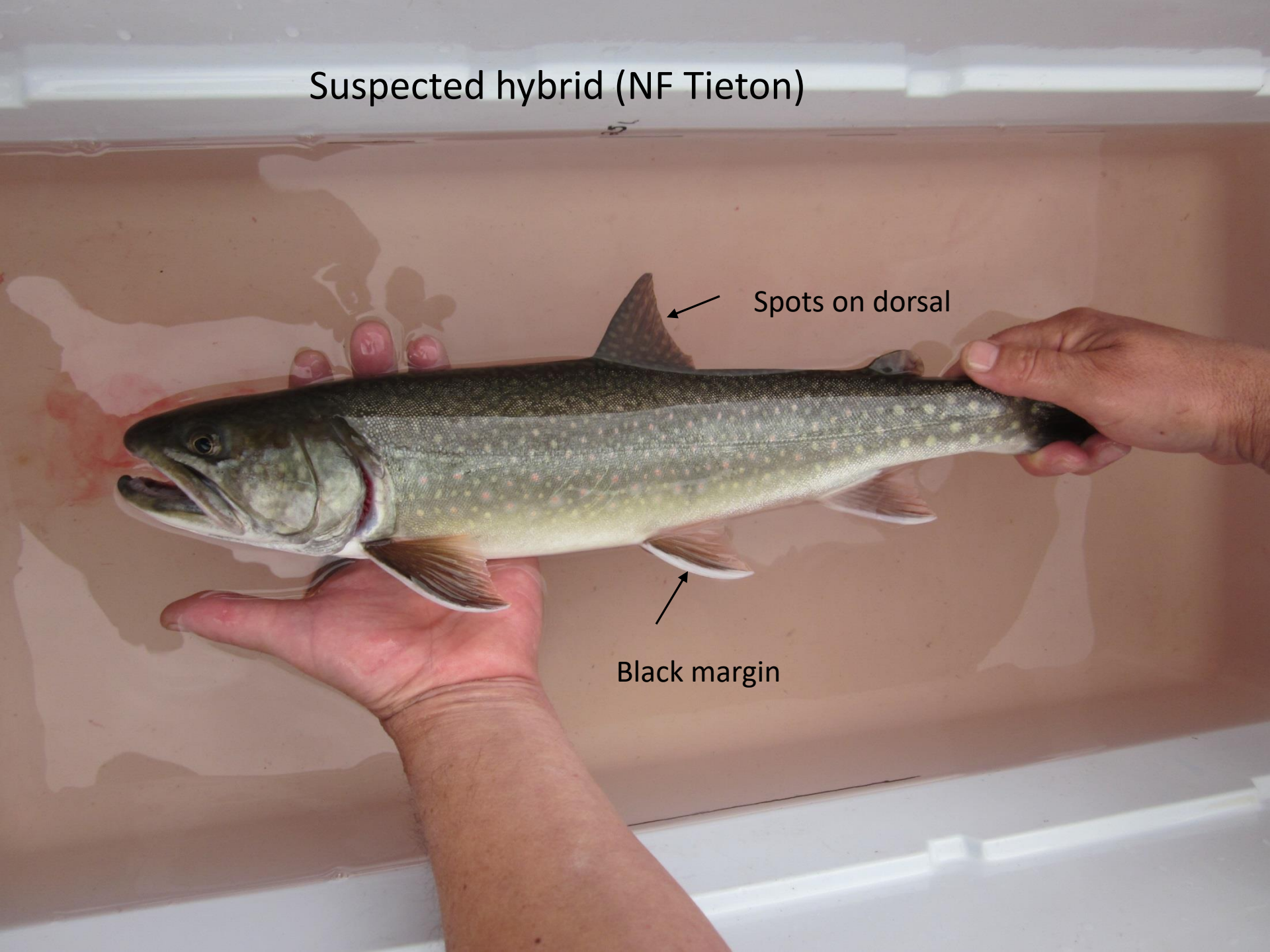

32.5 cm
July 7


70 cm July 7

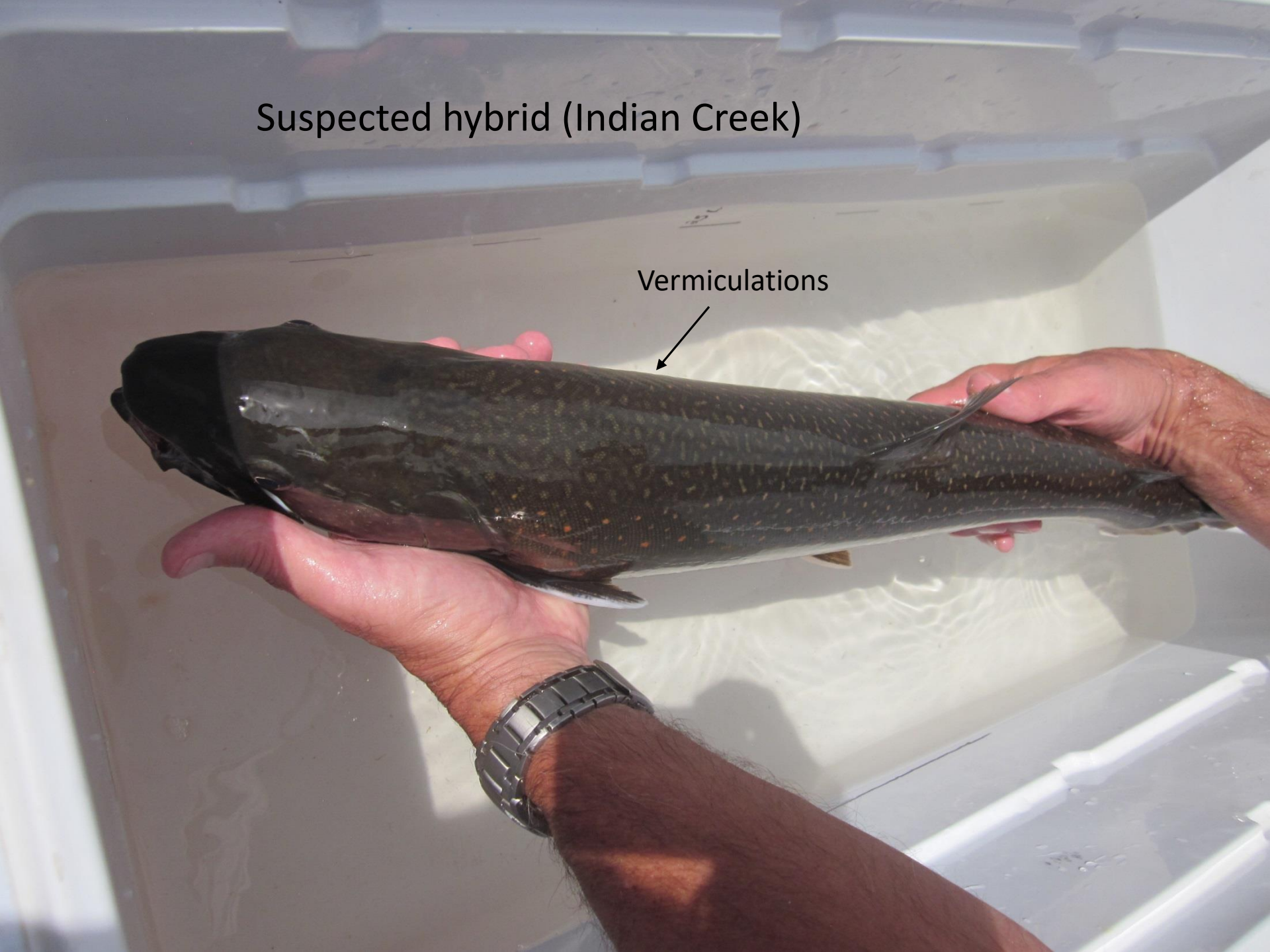
Tagging and Transport

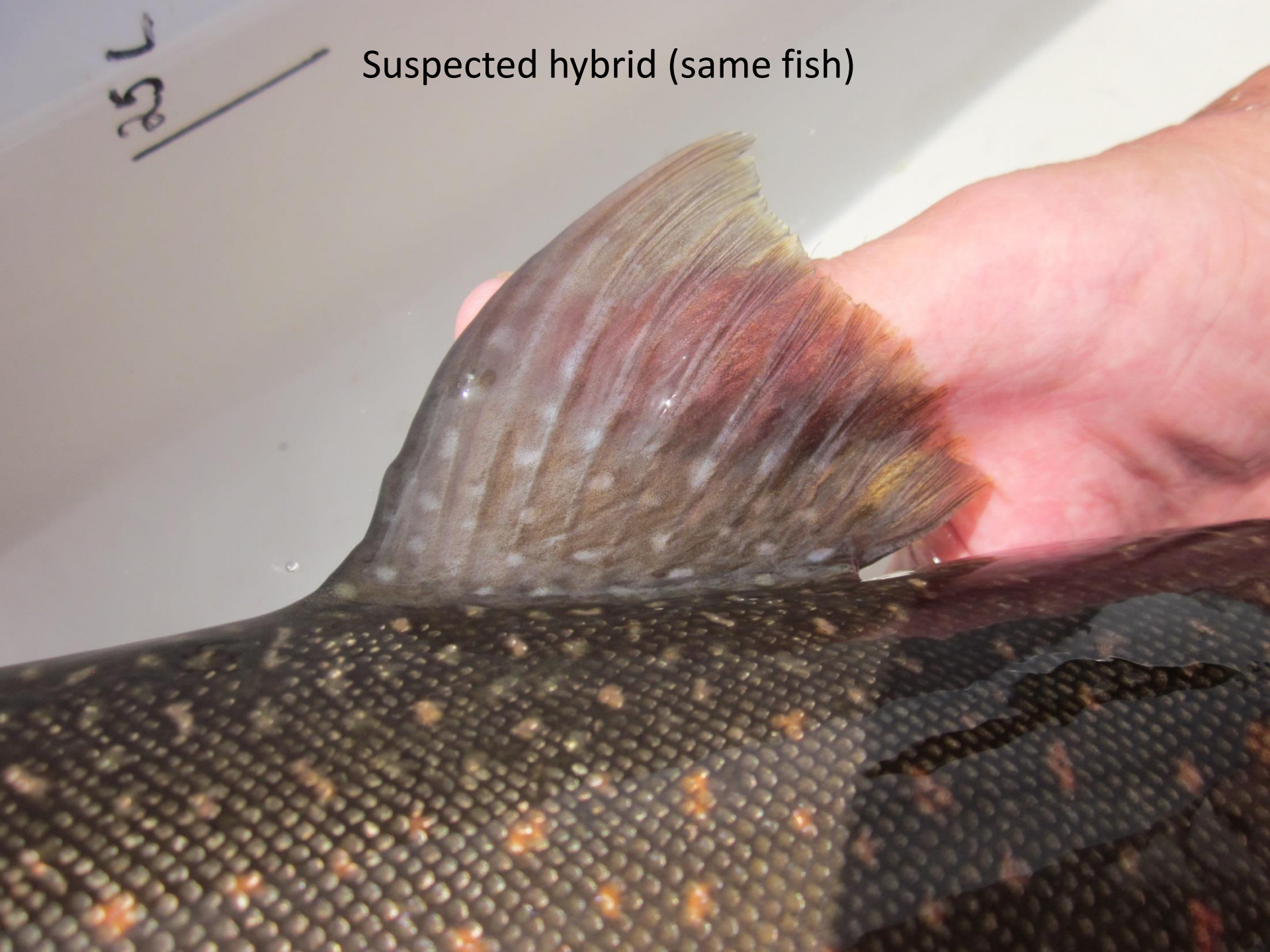
- Thirty fish were new encounters and were PIT tagged
- Thirty fish were transported above the dam; these included the two recaptures from 2015
- Two fish were not transported. Suspicious markings led us to believe they were brook/bull hybrids. These individuals were released downstream of the dam
- 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

Suspected hybrid (NF Tieton)

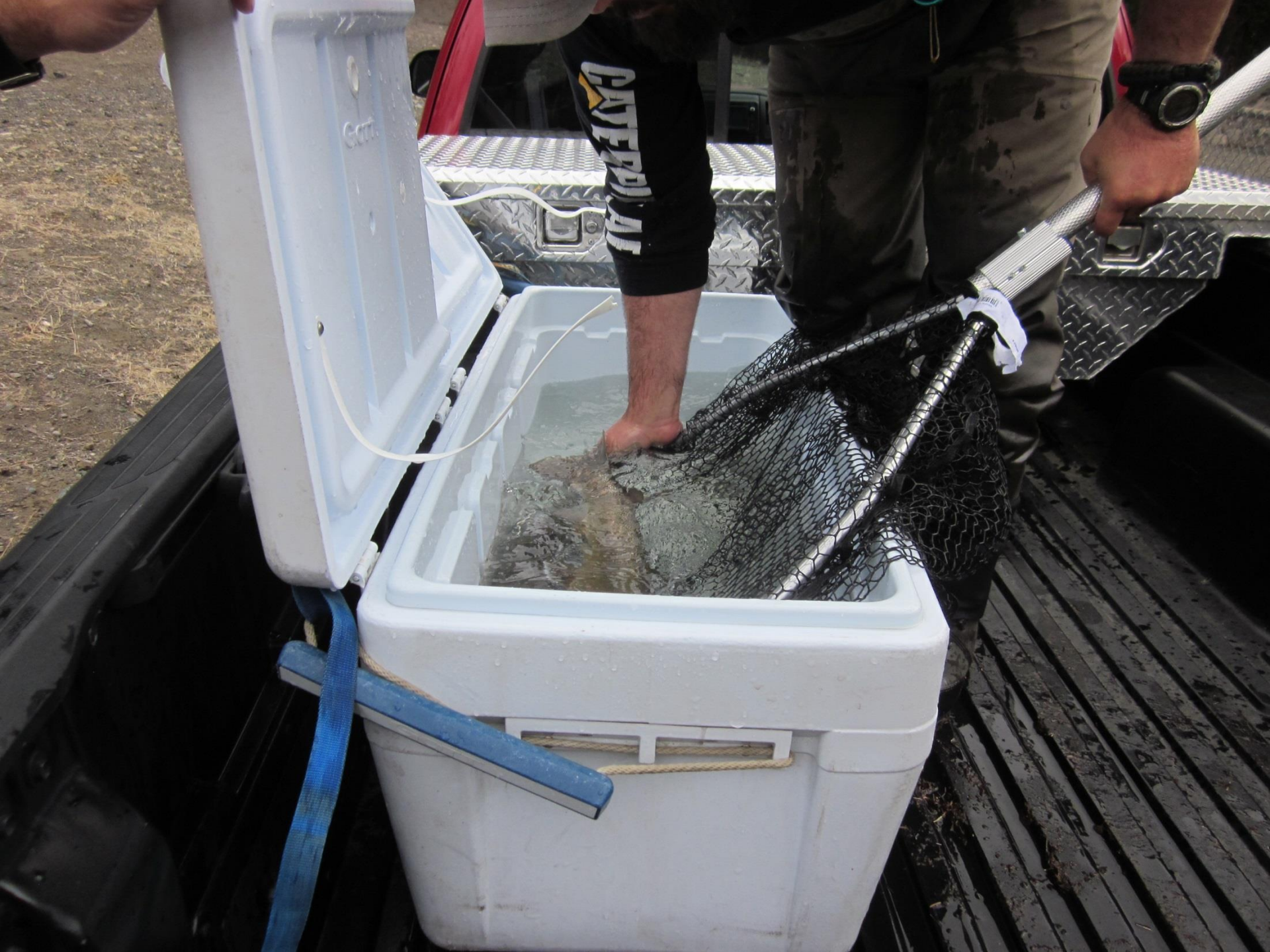


Suspected hybrid (Indian Creek)





Suspected hybrid (same fish)



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

- Only one of the 22 fish transported and subsequently detected was not detected up the North Fork; it was detected in Clear Creek just once (September 16)

PIT tag detections (emigration)

Three 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. One other fish may have left but it was detected only at the upper ladder detection array. This fish was detected on October 18 and 30 so it obviously did not leave on the earlier date. Since it showed up again we believe it probably did leave on that occasion but we did not have the capability to detect it further downstream at that time because we had decommissioned the lower ladder antenna on October 26

Genetic Analysis

- Genetic analysis recently competed by Mo Small indicates that 13 of the 30 fish tagged did not belong to the NF Tieton population. BIG SURPRISE!

- Five were pure SF Tieton bull trout and eight were from Indian Creek. All but one were transported, it being an Indian Creek fish that we suspected of being a hybrid (it was not)

- The other suspected hybrid which was not transported turned out to be a pure NF Tieton bull trout

- Only one hybrid was captured. It's bull trout genes were from the NF Tieton and it was transported

Only confirmed hybrid

Where did the 12 foreign transported fish go?

- Three of the five SF Tieton bull trout and two of the seven Indian Creek bull trout were among the eight which 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
- The last of the five Indian Creek bull trout which were detected after release was detected only in the NF Tieton
- Of the four bull trout which appear to have left Clear Lake after the spawning period, two were Indian Creek bull trout and two were NF Tieton fish

The fish kill

On a visit to our PIT tag interrogation site in the outlet channel of Clear Creek Dam on September 20 it was observed that a fish kill had occurred. Three adult bull trout carcasses were collected, one from the stilling basin and two others about 0.5 mile downstream.

The exact cause of the kill has not been determined but it is expected that anoxic conditions occurred in the depths of Clear Lake when the lake turned over. This anoxic water would have been released through the outlet works of the dam. This phenomenon had not been previously observed over the course of our four-year fish passage assessment.

The three dead bull trout genetically keyed to the Indian Creek population.

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