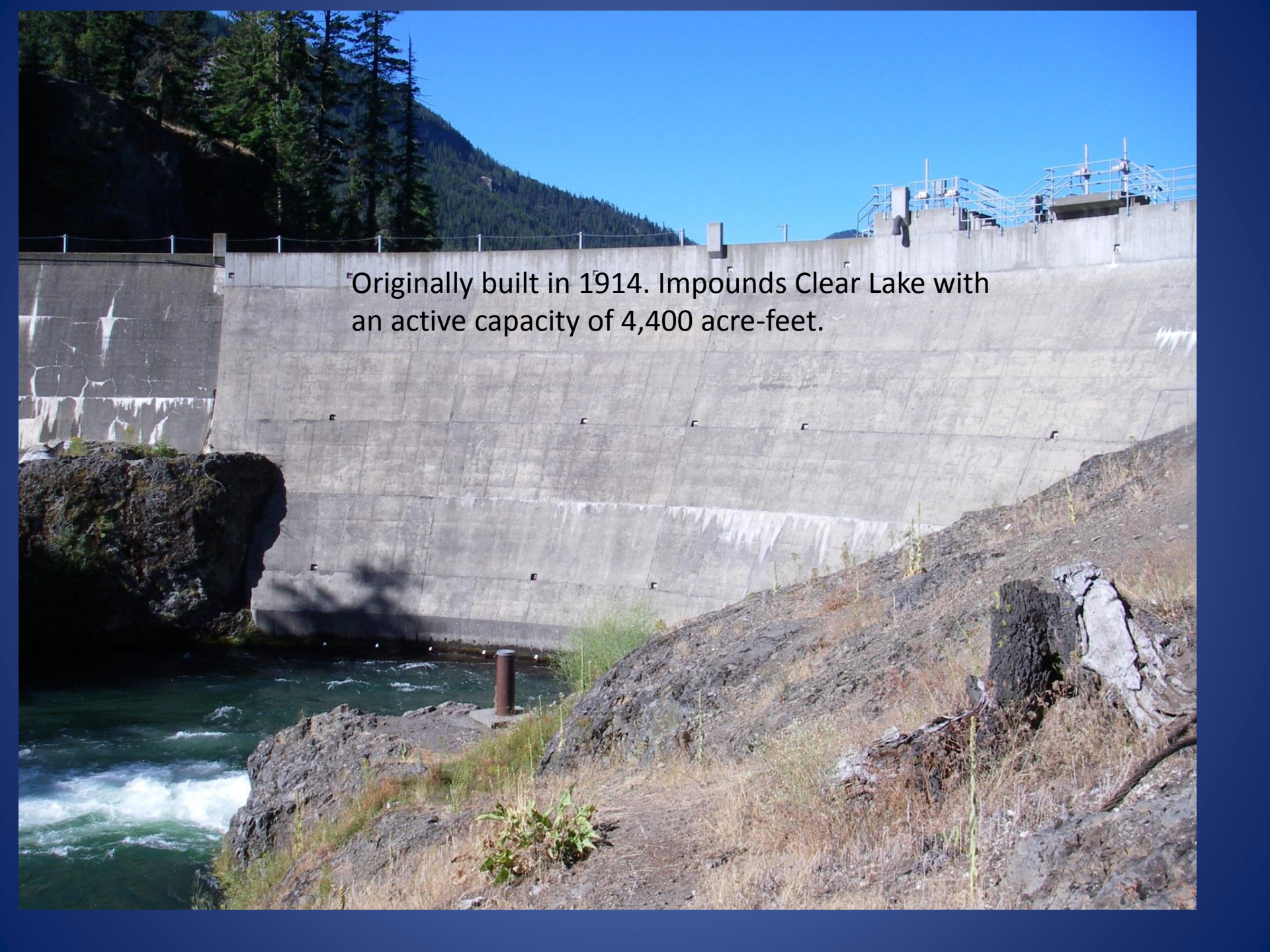# Clear Creek Dam Fish Passage Assessment

2012-2016

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USBR: Arden Thomas, YRBWEP

WDFW: Eric Anderson, John Easterbrooks

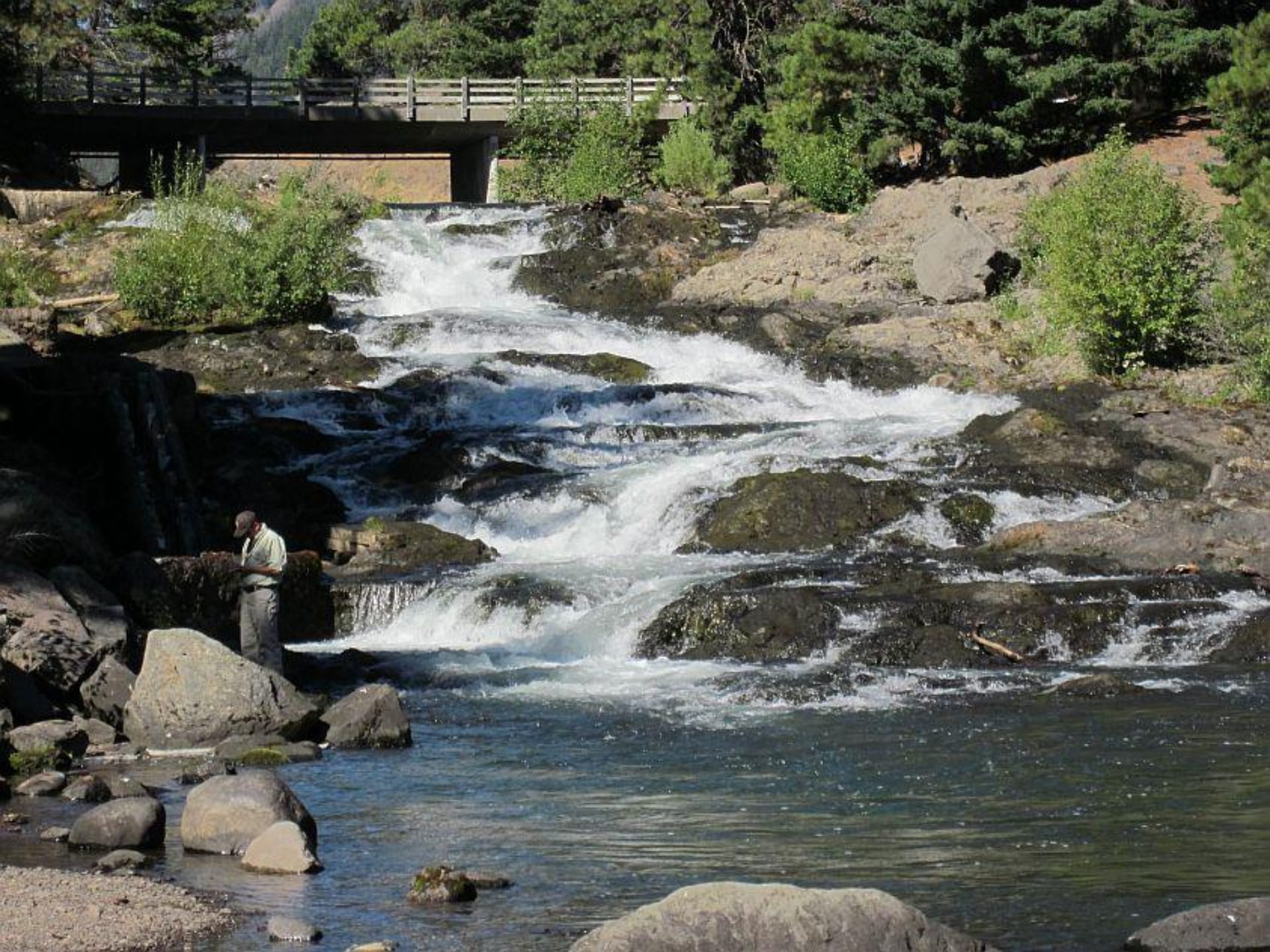Originally built in 1914. Impounds Clear Lake with an active capacity of 4,400 acre-feet.

Study Objectives

- Determine if and when bull trout attempt to migrate past Clear Creek Dam

- Assess passage success under various flow conditions

- Determine post-spawn migration timing and extent of Clear Lake use

Ancillary objectives include determining spawning frequency, collecting genetic samples, and estimating the size of the NF Tieton bull trout population

Study Methods

- Trap post-spawn fish in September in the NF Tieton River using a picket-weir box trap

- Surgically implant 23mm Half-Duplex PIT tags

- Obtain genetic samples and collect other data

- Construct PIT tag detection arrays at key locations

- Collect movement data

Trap located in the Goat Rocks Wilderness, 6.5 miles above Clear Lake

September 29, 2013

Oregon RFID

on

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MADE IN U.S.A

1 2 3

NO.R501-12

PIT-tagging results to date

- Trap was operated for three weeks in September for the last three years (2012-2014)

- 29 adult bull trout tagged (14 males, 15 females)

- In 2014, five bull trout were tagged; seven fish were captured that had been tagged in either 2012 or 2013

- 10 bull trout (four males and six females) were caught and PIT-tagged directly below Clear Creek Dam while angling on July 31, 2014 (a genetic sample was obtained from one other)

- A total of 39 adult bull trout have now been tagged

What Have We Learned So Far?

Status of tagged fish

- 24 of the 39 bull trout PIT-tagged in the first three years of the study were detected at least once in 2014

- Five of the 10 fish tagged in 2012 were not detected or recaptured in 2014; three of these were detected in 2013; two have not been re-encountered after tagging

- All but one of the 14 tagged in 2013 were detected in 2014

- All five of the bull trout tagged at the trap in 2014 were subsequently detected leaving the NF Tieton River

- Only one of the 10 fish tagged below the dam last July was later detected

Genetic Analyses

- Genetic samples from 40 adult bull trout captured between 2012 and 2014 were analyzed by the WDFW's Molecular Genetics Lab

- 34 of these fish were pure bull trout from the NF Tieton population

- Six were bull/brook trout hybrids, apparently first generation

- The analysis revealed that all 11 of the bull trout sampled below Clear Creek Dam in July, 2014 were pure bull trout from the NF Tieton population

Where do these bull trout live?

- 18 of the 24 bull trout tagged in 2012 and 2013 apparently never left Clear Lake as they were never detected either leaving or coming back, yet were all detected up the NF Tieton River in either or both 2013 and 2014

- One of the five fish tagged in 2014 was confirmed leaving the lake

- So most of this population resides in Clear Lake, right?

- This conclusion is confounded by the fact that the 11 fish captured below the dam in 2014 were all pure NF Tieton bull trout (a 12th fish captured below the dam was a recapture of a fish tagged in 2012)

Are bull trout unable to ascend the spillway channel?

- Have only detected three that have tried

- One was successful twice (2013 and 2014). This female, tagged in 2012, has been our most detected fish. We learned this past January that she is a hybrid

- Two, including one caught below the dam in 2014, tried and failed to make it up the spillway channel

- Caveats…

What is the size of the NF Tieton population?

- Don't really have an answer for that question yet but will be developing a mark-recapture estimate this year

- An estimate of the Effective Population Size (Ne) was calculated by WDFW's Molecular Genetics Lab from 40 genetic samples collected from 2012 and 2014

- For the three years combined Ne values ranged from 18-21 individuals (95% CI: 8-58)

- These numbers indicate that the NF Tieton population is relatively small and could be at risk of a loss of genetic variation

2015 Activities

- We will not be trapping any more bull trout this year

- We hope to capture 10-12 "new" bull trout below the dam. Genetic samples will be obtained from these fish and they will be PIT-tagged

- Keep all of our PIT tag detection arrays operating and collecting data as deep into the fall as is possible