Deschutes River Basin Adult Salmonid Passage

Future of Our Salmon Technical Workshop
Presenter: James Bartlett
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Location of Pelton Round Butte Hydroelectric Project
Pelton Round Butte Hydro Project
Adult Passage History

- **1956** - Temporary adult passage facilities constructed to pass adult salmonids around Project while constructing Reregulating Dam and Pelton Dam.

- **1957** – Permanent upstream fish passage facilities became operational.

- **1964** – Round Butte Dam completed with adult passage facilities.

- **1968** – Adult passage was discontinued due to low juvenile capture efficiency and delayed adult migration.

- **1973** - Permanent fish hatchery supplementation.

- **2005** – Licensees receive new 50 year Project License.

  - License’s required to construct, maintain, and operate fish passage facilities for reintroduction consistent with Fish Passage Plan.

- **2011** – Returning adults are passed upstream above Project.
Buckley Adult Processing Facility
Design and Operations

- Buckley Trap originally conceived 1930 by Bureau of Reclamation and Fish and Wildlife Service.
- Named from original prototype built near town of Buckley Washington.
Adult Salmonid Transport

Hatchery Broodstock and Reintroduced Adults
Adult Release Strategies
Round Butte Forebay

Round Butte Dam

Hypolimnic Release

Surface Release
Hypolimnic Adult Release
Stratified Reservoir

- 13-ft X 9-ft wide concrete vault (3,300gal).
- 4-ft X 3.5-ft release pipe entrance.
- 60-ft long / 20-inch diameter HDPE release pipe.
- 30-foot deep release pipe exit.
- Solar array and pump (0.4fps @ 300gpm).
Hypolimnic Adult Release Objectives

- Prevent thermal shock to adult salmonids during months when the reservoir is thermally stratified.
- Replace warm surface water with cool hypolimnic water.
- Volitional adult release below the thermocline.
Warm Water Evacuation Process and Timing

TIME = 0:00

PUMP BEGINS TO PULL WARM WATER OUT OF VAULT & RETURN TO LAKE.

DIFFERENTIAL HEAD DEVELOPS INSIDE VAULT RELATIVE TO POOL ELEVATION.

WATER FROM BELOW THERMOCLINE ENTERS PIPE AT ELEVATION 1910 (APPROX.)
PIPE VOLUME = 696 GALLONS
696 GAL/260 GPM = 3:00 MIN

ALL WARM WATER IN PIPE IS EVACUATED AND BEGINS TO DISPLACE WARM WATER IN VAULT
Fish Evacuation Time: ≤1 hour

Total Evacuation Time = 16:00

Temperature Goal: ≤18°C/64.4°F

VAULT VOLUME = 3322 GALLONS
3322 GAL/260 GPM = 13.00 MIN

ALL WARM WATER HAS BEEN EVACUATED FROM SYSTEM AND TEMPERATURE IS APPROXIMATELY THE SAME AS AT ELEVATION 1910.0 FT.
READY TO RECEIVE FISH FOR RELEASE.
Round Butte Dam Forebay
Surface Temp Compared to Adult Release Vault Temp at Time of Release 2013

Date

Temperature (°F)

Adult Release Vault Temp 2013
Forebay Surface Temp 2013
Questions?