

**Pelton Round Butte Fish Committee**

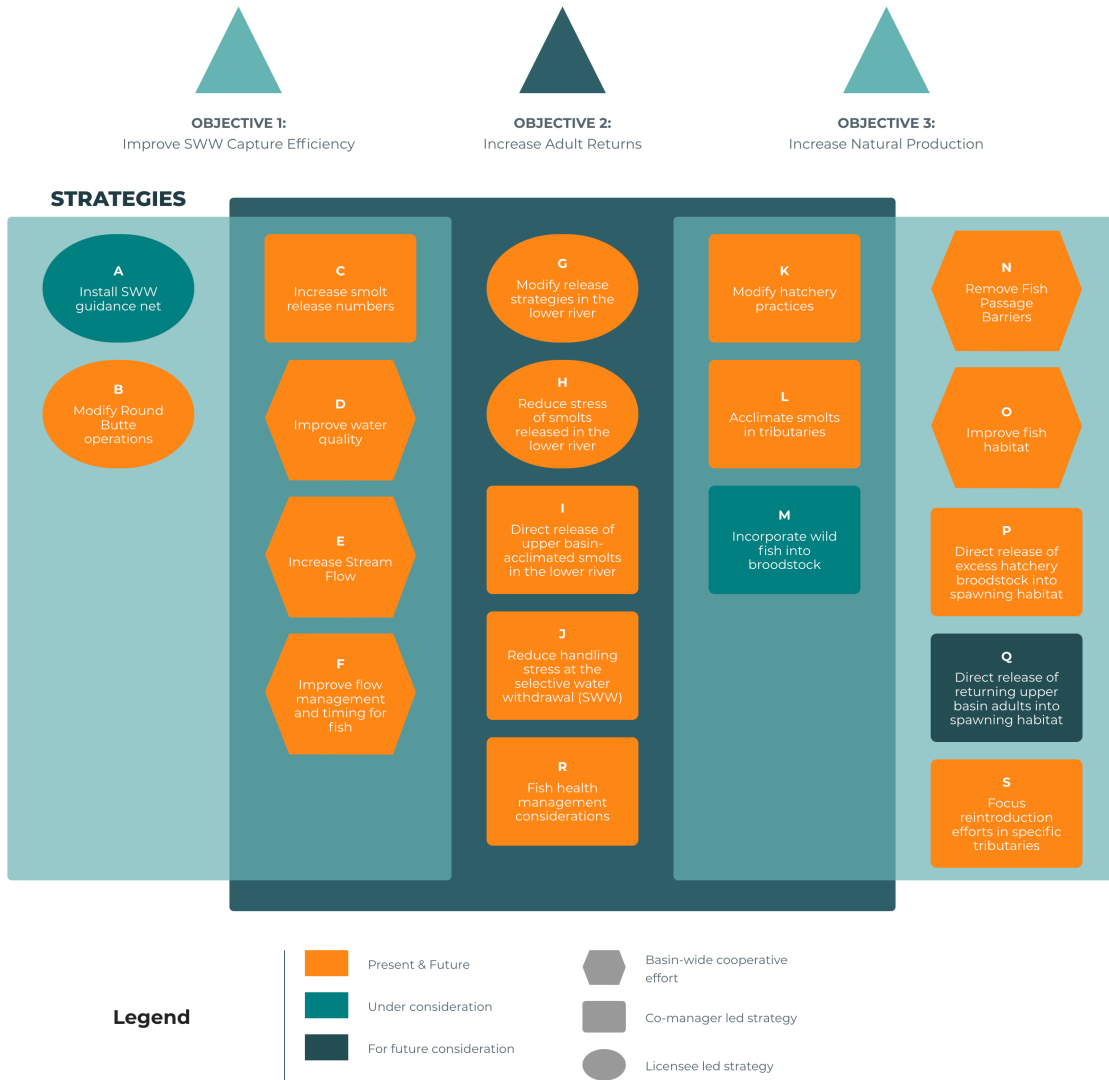
# **Reintroduction Road Map**

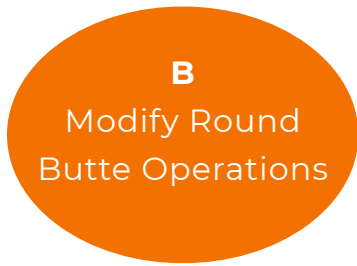
The reintroduction road map is a high level guide to strategies current and future, to impact the goal of returning self-sustaining and harvestable runs of spring Chinook, sockeye and summer steelhead to the Upper Deschutes Basin. Learn more about the history and purpose of our work in the [Executive Summary](#).

The road map is organized by objectives with each strategy represented by a shape that indicates who is responsible and a color to illustrate whether strategies are current or planned.

# Overview of Reintroduction Road Map

Goal: self-sustaining and harvestable runs of Chinook, sockeye, and steelhead.





## STRATEGY

# B: Modify Round Butte Operations

**Description:** The same water used for generation also serves as fish attraction water; therefore, by changing generation timing and level, we can affect Selective Water Withdrawal (SWW) collection efficiency. Analysis of fish collection data from 2010-2016 revealed a strong correlation between fish capture and generation levels with more fish collected when flow exceeded 5,000 cfs (Pyper 2016). A strong diurnal effect was also documented, with more fish collected during the early morning and evening hours (Pyper 2016). As a result, throughout the 2017 – 2020 migration seasons, the project operated consistently with increased nighttime flows, at a minimum of 4,500 cfs from 9:00 pm to 4:00 am, from March 15 to June 15, and captured a record number of smolts. Although this strategy is expected to continue into the future, flow levels and specific timing of nighttime generation may be changed based on future data collection and other considerations. For example, timing of 2021 nighttime generation flows were modified based on results of 2020 USGS sonar study. Additionally, low 2021 reservoir inflows did not allow continued release of 4,500 cfs during the nighttime generation period.

**Anticipated Outcome:** Reservoir passage efficiencies increase by 10-15%. Note: The fish response could change as smolt quality increases through hatchery changes, if there is a switch to wild broodstock or if a guidance net is constructed.

**Evaluation Method:** The evaluation period for this strategy has largely concluded and the strategy is now in the implementation phase. The Licensees will continue with annual monitoring of the percentage of PIT-tagged fish collected at the SWW from releases at the upper ends of the reservoir for comparison to the percentage collected before SWW

installation. In addition, fish passage/flow relationships will be quantified as described in Pyper 2017; initial analysis suggests a positive response in collection efficiency, especially with summer steelhead smolts, to the nighttime generation program. More in-depth studies may be designed if large-scale changes are made to the reintroduction program.

**Timeline:** Present and Future – Started in 2017 and anticipated to continue into the future. Specific timing and flow levels may be changed based on future data collection and other considerations.

**Lead Organization/Agency:** Licensees.

**Fish Committee Role:** Information is brought to the Fish Committee for input.

**Related Studies/Actions/Decisions:**

**2020 – 2021** – Portland General Electric (PGE) contracts with USGS to conduct baseline acoustic studies to determine fish behavior in the vicinity of the SWW without the presence of a guidance net. Results of initial study leads to efforts to “fine tune” hours of nighttime generation (Smith, C.D., Hatton, T.W., and Adams, N.S. 2021, Monitoring Fish Abundance and Behavior at a Selective Water Withdrawal Structure in Lake Billy Chinook, Deschutes River, Oregon, Using Multi-Beam Acoustic Imaging Sonar, Draft 2020: U.S. Geological Survey Open-File Report 2021)

**2016** – Pilot testing of fish passage/flow model. PIT-tagged fish were released under varying conditions and their collection efficiency was measured. Collection showed a positive response to increased nighttime flow (Pyper 2017).

**2015 - 2016** – Physical reservoir studies. Studies show that flows change with the SWW as predicted but flow magnitudes are very low. Zone of influence shifts with changing generation (Nugraha and Khangaonkar 2017, Stillwater Sciences 2015).

**2014 - 2015** – Statistical model relating fish passage to generation is developed. This shows that more flow at night will likely improve fish passage collection (Pyper 2015, Pyper 2016).

**2010 - 2015** – SWW Avoidance studies. Noise evaluation conducted by Bureau of Indian Affairs (BIA) determines not likely a deterrent. Lights turned off when the SWW personnel are not present. Experimental sprinklers are installed to break up the surface at the SWW fish entrances. These actions don't improve collection.

**2010 - 2013** – Juvenile migration studies. Initial passage rates looked good; Licensees met the Phase 1 goal in year one of SWW operations. Radio-tagging studies show that most fish enter the forebay, but many fail to enter the SWW, indicating an issue with 1) SWW avoidance and/or 2) guidance. Acoustic studies in the forebay show long residence times (Hill et al. 2014, Thompson et al. 2013).

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