

SALMON TECHNICAL TEAM REPORT 2
SALMON METHODOLOGY REVIEW-FINAL TOPIC SELECTION
COMMENTS ON CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
EXPERIMENTAL PARENTAGE-BASED TAGGED HATCHERY RELEASES

The Salmon Technical Team (STT) discussed the California Department of Fish and Wildlife (CDFW) report that identifies potential future methodology review items resulting from experimental releases of unmarked/untagged fry and initial efforts to implement Parentage-Based Tagging (PBT) for Sacramento River fall Chinook (SRFC). The STT provides the following comments.

The STT has been made aware of recent hatchery releases of unmarked (no adipose fin clip) and untagged (no coded-wire tag, CWT) SRFC fry into the Sacramento basin. It is our understanding that some of these releases will be genetically tagged which could allow for tag recovery using PBT. By sampling the genetics of the parent pair, the DNA of the resulting offspring is known and can be identified upon recovery using genetic tools. While the stock and age data provided from PBT can be generally comparable to the stock and age data currently provided from CWTs, at this point it is unclear how this new data can be incorporated and what new sampling procedures may need to be developed for PBT to play a role in the Council's salmon management regime.

To date, unmarked/untagged PBT fry releases of SRFC have consisted of approximately 1.8 million fish released in 2022, and more than 3 million fish released in 2023. There are proposals to substantially increase such releases to values in the tens of millions. While the benefit of releasing fish as fry with no visual or internal marks instead of smolts with visual marks or CWTs may allow hatchery managers to increase overall production and have greater flexibility in release strategies, this new tagging strategy can have substantial implications for the Council's salmon stock assessment and management.

The STT has not had the opportunity to fully evaluate the feasibility of incorporating PBT data into existing models used for assessment and fishery planning. Furthermore, it is unclear if coordinated monitoring plans can be in place to recover and process data associated with PBT. A very initial assessment of potential issues with incorporating a PBT tagging program follows.

1. *Abundance forecasting:* Abundance forecasts for SRFC (i.e., the Sacramento Index) could become less accurate if maturation rates change markedly as a result of expanded fry releases.
2. *Estimation of exploitation rates:* The release of unmarked and untagged fry releases may hamper the ability to implement cohort reconstructions for SRFC. If a comprehensive PBT sampling plan is not in place for all relevant marine and freshwater areas, the ability to distinguish between hatchery and natural origin fish is reduced, which complicates the development of cohort reconstructions.
3. *Ocean and Inland Monitoring:* Genetic samples of unmarked fish must be collected at every recovery location that is currently sampled for SRFC CWTs. This would require extensive changes to sampling methodology in California and Oregon's ocean

fisheries, as well as sampling programs inland sport fisheries, hatcheries, and natural escapement surveys throughout the Central Valley.

4. *Lab Processing:* The high volume of genetic samples resulting from comprehensive monitoring would need to be processed on an extremely tight timeline to be available for the beginning of the fisheries planning process in January.
5. *Database Management:* Either a new database would need to be created, or existing data structures augmented, to support the collection, synthesis, and sharing of these data.

Since unmarked/untagged PBT fish have already been released into the system, these fish would have likely appeared in 2023 ocean harvest had fisheries been executed (acknowledging that there are 2023 ocean fisheries allowing Chinook retention in Oregon). It is unclear whether adequate sampling plans for PBT are in place for inland sampling for the 2023 return.

The STT has had very little time to discuss the assessment and management implications of unmarked/untagged and unmarked/PBT releases of SRFC. More work will need to be done to fully assess the effects on the Council salmon management process.

PFMC
09/09/23