

5.7 Coleman National Fish Hatchery

Coleman National Fish Hatchery (NFH) was completed by the USBR in 1943 to partially mitigate for habitat and fish losses caused by construction of two Central Valley Project features, Shasta and Keswick dams. The hatchery is funded by the USBR and operated by the USFWS. Coleman NFH occupies 75 acres adjacent to Battle Creek, a tributary to the Sacramento River, about 20 miles southeast of Redding.

Shasta Dam blocks 187 miles of salmonid spawning and rearing habitat. Fall Chinook, late-fall Chinook and steelhead are produced to mitigate for this habitat loss, to contribute to ocean and river harvest, and to provide adequate escapement to the hatchery for broodstock. These three programs are summarized below, followed by the California HSRG's major recommendations that apply to all Coleman programs and then sections presenting program-specific recommendations.

The Central Valley fall/late fall-run Chinook salmon ESU was classified as a federal Species of Concern in 2004. This ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin rivers and their tributaries, east of the Carquinez Strait.

The Central Valley steelhead DPS was classified under the ESA as threatened in 1998. The DPS includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in the Sacramento and San Joaquin rivers and their tributaries, east of the Carquinez Strait, and the Feather River Hatchery and Coleman National Fish Hatchery steelhead programs.

Coleman NFH Fall Chinook Program

The fall Chinook salmon program is integrated with the natural spawning populations in Battle Creek and the Sacramento River. Program broodstock include returning hatchery-origin fish collected from the hatchery fish ladders, and natural-origin fish collected at the Battle Creek weir. Managers also use the barrier weir to block the movement of hatchery-origin fall Chinook into upper Battle Creek in order to protect the ESA-listed spring Chinook salmon spawning in that area, although the weir is ineffective during high flow events.

The program annually releases 12 million fall Chinook in April at a size of 90 fpp, which are expected to contribute a total of 120,000 fish to harvest and escapement over the life of the brood (60-75 percent for harvest). Released fish are constant fractionally marked at a rate of 25 percent (adipose fin-clipped

and coded wire-tagged). Ninety percent of program fish are released at or near the hatchery in Battle Creek; ten percent are released into San Pablo Bay.

Coleman NFH Late-Fall Chinook Program

Late-fall Chinook salmon have been managed distinctly from fall Chinook salmon at Coleman since 1973. The late-fall Chinook salmon program is integrated with the natural spawning populations in Battle Creek and the Sacramento River. Program broodstock include returning hatchery-origin fish collected from the hatchery fish ladders and Battle Creek weir, and natural-origin fish collected at the Keswick Dam fish trap. Managers also use the barrier weir to block the movement of hatchery-origin late-fall Chinook into upper Battle Creek in order to protect the ESA-listed spring Chinook salmon spawning in that area, although the weir is ineffective during high flow events.

The program annually releases 1 million late-fall Chinook in December at a size of 13 fpp, which are expected to contribute a total of 10,000 fish to harvest and escapement over the life of the brood (50 percent to harvest). All released fish are adipose fin-clipped and coded wire-tagged, and released at or near the hatchery in Battle Creek.

Coleman NFH Steelhead Program

Until recently, the steelhead program was operated in an integrated fashion, incorporating into the broodstock natural-origin Sacramento River fish from 1947–1986, and natural-origin Battle Creek fish from 1952–2009. The use of natural-origin fish in the program was discontinued in 2009 due to the low abundance of Battle Creek natural-origin fish. If the abundance of the Battle Creek population recovers to sufficient levels in the future, the program will be re-integrated with this population.

The program annually releases 600,000 steelhead in January at a size of 4 fpp, which are expected to contribute a total of 3,000 fish to harvest and escapement over the life of the brood (33 percent for harvest). All released fish are adipose fin-clipped, and released into the Sacramento River at Bend Bridge (about 15 miles downstream of the Battle Creek confluence) to reduce predation on newly emerging Chinook in the upper Sacramento River and Battle Creek. Managers use the Battle Creek barrier weir to block the movement of hatchery-origin steelhead into upper Battle Creek, although the weir is ineffective during high flow events.

The adult return goal to the hatchery has been met in 7 of the last 11 years. Creel survey data indicate that approximately 500 steelhead are harvested annually in the upper Sacramento River, and that the majority of these fish were likely Coleman NFH steelhead since only adipose fin-clipped steelhead can be retained as harvest.

5.7.1 Recommendations for All Coleman Hatchery Programs

- Transporting and releasing juveniles to areas outside of Battle Creek should be discontinued. Juvenile fish should be released at the hatchery to reduce adult straying and increase the number of adult fish returning to the hatchery. Consider necessary facility modifications or equipment purchases that will facilitate on-site releases. Release locations for steelhead may take into consideration ecological and predation effects on other fish populations but should not compromise homing of adults to the hatchery.

- Performance standards for each phase of the fish culture process should be established and tracked annually. Summaries of data collected with comparisons to established targets must be included in annual hatchery reports.
- The emergency backup water intake (#2) should be screened to prevent fish entrainment.
- The USFWS should develop a Hatchery Procedure Manual for each program at Coleman NFH that includes performance criteria and culture techniques presented in IHOT (1995), Fish Hatchery Management (Wedemeyer 2001) or comparable publications.

5.7.2 Coleman Fall Chinook- Major Program Recommendations

The major recommendations of interest to resource managers for the Coleman NFH fall Chinook salmon program are provided below. Those selected for presentation may represent major changes in operations, changes in approach or outcomes towards achieving harvest or conservation goals, or will require substantial investment of resources. The California HSRG's evaluation of program compliance with standards and guidelines and the group's comments about this program are presented in their entirety in Appendix VIII.

- Program fish should be 100 percent coded wire-tagged and 25 percent adipose fin-clipped.

5.7.3 Coleman NFH Late-Fall Chinook – Major Program Recommendations

The major recommendations of interest to resource managers for the Coleman late-fall Chinook salmon hatchery program are provided below. Those selected for presentation may represent major changes in operations, changes in approach or outcomes towards achieving harvest or conservation goals, or will require substantial investment of resources. The California HSRG's evaluation of program compliance with standards and guidelines and the group's comments about this program are presented in their entirety in Appendix VIII.

- It is recommended that managers investigate the feasibility of collecting natural-origin adult fish at alternate locations, including collecting and retaining fish from Battle Creek.

5.7.4 Coleman NFH Steelhead- Major Program Recommendations

The major recommendations of interest to resource managers for the Coleman steelhead hatchery program are provided below. Those selected for presentation may represent major changes in operations, changes in approach or outcomes towards achieving harvest or conservation goals, or will require substantial investment of resources. The California HSRG's evaluation of program compliance with standards and guidelines and the group's comments about this program are presented in their entirety in Appendix VIII.

- Adult steelhead holding facilities should be upgraded and/or expanded to provide adequate space, water flows and temperature regimes to hold the number of adults required for broodstock at high rates of survival (greater than 90 percent).
- This program should be converted back into an integrated program with a minimum pNOB of 10 percent which thus requires 40-50 natural-origin adults. In recent years, due to the current low abundance of Battle Creek natural-origin steelhead and the concern that collecting these fish for natural-origin broodstock is likely to negatively affect population viability (Standard 1.13), no

natural-origin fish have been incorporated into the spawning matrix. It is recommended that managers investigate the feasibility of collecting natural-origin adult fish at alternate locations (e.g., Keswick Dam fish trap) until the abundance of natural-origin steelhead returning to Battle Creek has sufficiently increased to resume their incorporation into the program.

- Current efforts should be expanded to determine the cause of low smolt-to-adult returns for this program. Possible residualization, high in-river mortality, high mortality in the delta/estuary or the ocean, straying as adults, and under-reported catch may be factors.
- Hatchery-origin adult steelhead returns to the hatchery should be treated as follows: (1) unspawned males should be extended reconditioned and released; (2) unspawned females should be stripped of eggs, extended reconditioned and released; and (3) spawned fish should be removed from the system, or extended reconditioned and released.
- Natural-origin adult steelhead returns to the hatchery, whether spawned or unspawned, should be released. Fish may be reconditioned prior to release.