



U.S. Fish & Wildlife Service - Pacific Region
Columbia Basin Hatchery Review Team

Idaho Lower Snake River Compensation Plan
State Operated Facilities
Snake, Salmon, and Clearwater River Watersheds



**Clearwater, Magic Valley, McCall, and Sawtooth Fish
Hatcheries**
Assessments and Recommendations

Draft Report, Summary
April 2009

DRAFT

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Summary

Long-term conservation needs of natural salmonid populations and their inherent genetic resources require a reexamination of the role of hatcheries in basin-wide management and conservation strategies. Hatcheries must be viewed as part of the environmental and ecological landscape to help achieve both conservation and harvest goals. These goals need to be part of a holistic and integrated strategy that combines habitat, hydropower and harvest needs for conserving and managing fishery resources. These strategies must establish short- and long-term goals for both hatchery-propagated and naturally-spawning populations.

To ensure that its hatchery programs are best meeting conservation and harvest goals, the US Fish and Wildlife Service (Service) began, in October 2005, a four-year review of 21 salmon and steelhead hatcheries that the Service owns or operates in the Columbia River Basin. The review was expanded in 2008 to include three National Fish Hatcheries on the Olympic Peninsula of Washington State. The goal of these reviews is to ensure that Service hatcheries are operated in accordance with best scientific principles, and contribute to sustainable fisheries and the conservation of naturally-spawning populations of salmon, steelhead and other aquatic species. The Service's review process is modeled after the Puget Sound and Coastal Washington Hatchery Reform Project which was completed in 2005 and subsequently expanded to the Columbia River¹. The Service plans to complete its reviews by the end of 2009.

The report presented here provides benefit/risk assessments and recommendations for salmon and steelhead propagation programs conducted at Clearwater, Magic Valley, McCall and Sawtooth Fish Hatcheries (FH). Clearwater FH is located within the Clearwater River watershed in north central Idaho. Sawtooth FH is located in the Salmon River watershed near Stanley, Idaho. McCall FH is located in the upper Payette River watershed in McCall, Idaho, and Magic Valley FH is located in the Thousand Springs area of the Snake River near Filer, Idaho. All four hatcheries are operated by Idaho Department of Fish and Game (IDFG). Programs at these four hatcheries operate cooperatively as part of the Lower Snake River Compensation Plan (LSRCP), a federally funded program to mitigate for fish losses associated with four "run-of-the-river" hydroelectric and transportation dams on the lower Snake River in Washington State. The report presented here complements a report for Dworshak, Kooskia, and Hagerman National Fish Hatcheries (NFHs) that are also located within Idaho and the Snake River Basin.

The Review Team considered, as a foundation for its assessments, four characteristics of each salmonid stock in the Clearwater and Salmon River watersheds of the Snake River: *biological significance*, *population viability*, *habitat* conditions, and *harvest* goals. The Review Team attempted to use both short- (15 years) and long-term (50–75 years) goals for each salmonid stock, as identified by the fishery comanagers², as a foundation for assessing the benefits and risks of the reviewed hatchery programs. Source documents not readily available to the general public, including appendices and background documents for this report, are accessible via the Service's hatchery review website.³

¹ www.hatcheryreform.us

² LSRCP comanagers in Idaho are the U.S. Fish and Wildlife Service, IDFG, Nez Perce Tribe, Shoshone-Bannock Tribes, with comanaging input from the National Marine Fisheries Service (NOAA Fisheries).

³ www.fws.gov/Pacific/fisheries/HatcheryReview/

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Clearwater Fish Hatchery

Facility overview: Clearwater Fish Hatchery (FH) is located at river mile 41 of the Clearwater River at the confluence of the North Fork Clearwater River, 76 miles upstream from Lower Granite Dam, and 526 miles upstream from the mouth of the Columbia River. The hatchery was constructed under the LSRCP Program to offset fish losses caused by the construction and operation of four hydropower dams on the lower Snake River. The hatchery was completed and became operational in 1990. The hatchery includes three satellite facilities within the Clearwater River watershed for releasing juvenile fish and capturing adult fish for broodstock: Powell Satellite Facility, located within the Lochsa River subbasin, and Red River and Crooked River satellite facilities, both of which are located on respective tributaries to the South Fork Clearwater River. Clearwater FH does not have the capability to release fish or capture adult fish for broodstock and must rely on other facilities to obtain eggs or fish for rearing. The principle water source for rearing fish at Clearwater FH is the reservoir behind Dworshak Dam. This water is provided to the hatchery by a gravity-feed pipeline that can access water in the reservoir at two different depths and temperatures.

Summer Steelhead (B-run)

Program overview: The program operates primarily as a *segregated harvest* program within the Clearwater River watershed. Approximately 1.4 million eyed eggs of the Dworshak NFH B-run steelhead stock are obtained annually from Dworshak NFH. Eggs are hatched and the resulting fish reared on station for approximately one year. Approximately 266,000 yearling smolts (100% with clipped adipose fins) are outplanted annually into the lower South Fork Clearwater River at the “Red House” site, approximately 19.1 miles upstream from the confluence of the Middle Fork. Yearling smolts are also outplanted into the following areas of the upper South Fork Clearwater River:⁴ (a) 233,000 smolts (83,000 with unclipped adipose fins) are released into Crooked River; (b) 250,000 smolts (150,000 with unclipped adipose fins) are released into Red River; (d) 25,000 smolts (100% with unclipped adipose fins) are released into Meadow Creek; (e) and 25,000 smolts (100% with unclipped adipose fins) are released into Mill Creek. In addition, 50,000 yearling smolts (100% with unclipped adipose fins) are released into Lolo Creek, a tributary to the Clearwater River approximately midway between the North and Middle Forks. Clearwater FH also receives approximately 1.3 million fertilized green eggs (water hardened) for incubation to the eyed stage. The hatchery then transfers approximately 215,000 eyed eggs to Hagerman NFH and 830,000 eyed eggs to Magic Valley FH for hatching and grow-out to the yearling smolt stage for subsequent outplanting in the Salmon River basin.⁵ The benefits and risks associated with these latter outplants into the Salmon River are discussed with the evaluations of Magic Valley FH (this report) and Hagerman NFH (complementary NFH report for the Snake River).

Benefits: Comanagers believe that the hatchery program confers significant sport and tribal harvest benefits. IDFG estimated that for run years 2001 thru 2006, an average of 3,443 (range = 1,265 to 7,600) adult steelhead originating from Clearwater FH steelhead were harvested annually. Based on coded-wire tag data from Dworshak NFH, approximately 28% of returning adult steelhead are captured in Columbia River gillnet fisheries – caught primarily in fisheries targeting fall Chinook (*O. tshawytscha*) - and 27% percent are caught in sport fisheries in the Columbia and

⁴ Natural populations of steelhead in the upper South Fork of the Clearwater River are believed to have been extirpated by Harpster Dam, constructed at river mile 22, which blocked all upstream passage of steelhead and other fish species from 1911 to 1935 and from 1949 to 1963. A fish ladder was installed at the dam in 1935, and it provided some passage opportunity until 1949 when it was destroyed by high river flows.

⁵ The transfer of 215,000 eyed eggs to Hagerman NFH will be discontinued in 2009, and the number transferred to Magic Valley FH increased to approximately 1.0 million eyed eggs.

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Snake River basins. The Team expects a similar recovery and distribution pattern for the B-run steelhead reared at Clearwater FH and released into Lolo Creek and South Fork Clearwater tributaries. From 2001 to 2006, the sport fishery harvested 17,849-30,111 fish per year in the Clearwater River, and the tribal fishery harvested an estimated 1,000–1,470 fish per year in the North Fork of the Clearwater River, derived from releases and outplants from both Clearwater FH and Dworshak NFH. Tribal harvests also confer cultural benefits to tribal members. The program also confers a minor conservation benefit to the Dworshak B-run steelhead stock by reducing the risk of a catastrophic brood year losses resulting from a disease outbreak or pump failure at Dworshak NFH.

Risks: Crowding and loading of fish onto trucks for transportation to release sites poses risks to the transported fish that do not occur with on-station releases. The continued outplanting of Dworshak B-run steelhead at sites near natural spawning areas of the upper South Fork Clearwater River and Lolo Creek poses genetic risks to natural populations and inhibits long-term local adaptation of both hatchery-origin and natural-origin fish. Outplanting approximately 800,000 Dworshak B-run steelhead smolts annually in the South Fork Clearwater River poses ecological (food and space competition) risks to natural populations of steelhead. The high concentration of anglers in the South Fork Clearwater River targeting hatchery-origin steelhead poses a demographic risk to natural populations in the upper watershed via incidental harvest and mortality. The Review Team concluded that the overall management strategy for steelhead in the South Fork Clearwater River, coupled with the absence of well-defined conservation goals or plan, creates conflicts between harvest and/or recovery of natural populations.

Recommendations for current program: The Review Team identified 18 specific recommendations to reduce risks and/or improve benefits of the current summer steelhead program at Clearwater FH. These recommendations include: (a) establishment of a long-term conservation and fishery management plan for steelhead in the South Fork Clearwater River and Lolo Creek; (b) the phase-out of direct outplanting of Dworshak NFH B-run steelhead into the upper South Fork Clearwater River and Lolo Creek where returning adults that escape fisheries cannot be recaptured; (c) evaluation of the abundance and productivity of natural populations of steelhead in Lolo Creek and tributaries of the South Fork Clearwater River; and (d) development of one or more localized broodstocks of steelhead for the South Fork Clearwater River to meet specific harvest and/or conservation goals (to be defined and described in the recommended conservation and fishery management plan under “a” above). The Team concluded that a comprehensive management plan for steelhead in the South Fork Clearwater River, with specific short-term and long-term conservation goals for natural populations, is needed to resolve conflicts with current harvest goals for hatchery-origin fish.

Alternatives to current program: The Review Team considered the pros and cons of six alternatives to the existing B-run summer steelhead program at Clearwater FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Clearwater FH and decommissioning the facility (Alternative 6). The Review Team recommends continuation of the existing program with implementation of all recommendations (Alternative 1) and Alternative 4: reduce the number of outplanted steelhead in the South Fork Clearwater River by up to 315,000 smolts and outplant those fish directly into the Little Salmon River from Clearwater FH instead of from Magic Valley FH and Hagerman NFH. These recommendations include termination of Dworshak B-run steelhead outplants into Crooked River, Red River, Meadow Creek, Mill Creek, and Lolo Creek, continuation of the current outplanted release of 260,000 smolts at the Red House site in the lower South Fork Clearwater River, and the release of an additional 268,000 smolts at the Red House

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site or into the N.F. Clearwater River to support tribal and recreational fisheries. The Review Team noted several merits of rearing only steelhead or spring Chinook at Dworshak NFH (see below) and rearing the other species at Clearwater FH (Alternatives 2 and 3, respectively), but the absence of smolt-release and adult-recapture capabilities at Clearwater FH precluded further consideration of those alternatives. The Review Team also recommends development of a long-term management and recovery plan for South Fork Clearwater River steelhead population(s), including the potential use of the Crooked River and Red River facilities to develop localized broodstocks.

Spring Chinook

Program overview: The program is intended to operate currently as two *segregated harvest* programs within the Clearwater River watershed: (1) Powell-Lochsa River program with adult spring Chinook collected for broodstock at the Powell Satellite Facility in the Lochsa River watershed, and (2) South Fork Clearwater River program with adults collected for broodstock at the Crooked and Red River satellite facilities. Broodstocks for the two programs are currently considered *segregated* with returning hatchery-origin adults used for broodstock; however, the long-term goal is to ultimately transition the two programs to integrated broodstocks as natural populations in the respective watersheds rebuild⁶. Adult spring Chinook returning to each of the three satellite facilities originated ancestrally from several reintroduction releases of juvenile fish representing the Rapid River FH stock and, to a lesser degree, the Carson NFH stock. Releases of hatchery-origin spring Chinook at the satellite facilities began in 1977 at the Red River facility and in 1989 at the Powell and Crooked River facilities. The broodstock goal is to spawn 944 (472 females) spring Chinook trapped at the Powell facility and a combined total of 1,070 adults (535 females) trapped at the Crooked and Red River facilities. Release objectives for South Fork spring Chinook include 400,000 yearling smolts (100% with clipped adipose fins) into the Red River and 700,000 yearling smolts (100% with clipped adipose fins) into the Crooked River. Release objectives for Lochsa River spring Chinook include 400,000 yearling smolts (100% with clipped adipose fins) at the Powell Satellite Facility, 300,000 yearling smolts into the lower Selway River, and 300,000 young-of-the-year parr (66.7% with clipped adipose fins) released in July into the upper Selway River. Considerable transfer of eggs and fish has occurred between the two programs in the past, including backfilling of broodstock needs with eyed eggs from Dworshak NFH and Rapid River FH. Adults collected in excess of broodstock needs for the two programs, including broodstock needs for the Nez Perce Tribal Hatchery, have been outplanted to various sites within the Selway, S.F. Clearwater, and Lochsa rivers. Spring Chinook in the Clearwater River are the product of recent reintroduction efforts and are excluded by NOAA Fisheries from the ESA-listed *Snake River spring/summer Chinook salmon ESU*.

Benefits: Harvest benefits from spring Chinook reared at Clearwater FH have been highly variable, ranging from zero to 1,901 fish (mean \approx 1,500 fish) per year for 1997-2005. However, ascertaining harvest benefits has been impeded in the past by a general lack of adequate tagging (e.g., with CWTs). The program has provided no quantified conservation benefits and has no specific conservation goals, although hatchery-origin adult fish have been outplanted to assist with reestablishing naturally spawning populations. The Powell satellite facility participates in the

⁶ *Native populations of spring Chinook in the Clearwater River were extirpated in the mid-1900's by Lewiston Dam (1927-1973) which blocked all upstream migration of Chinook salmon into the Clearwater River.*

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Idaho Supplementation Studies on Crooked Fork Creek to assess the productivity effects of hatchery fish spawning naturally, thus providing a research benefit.

Risks: The continued use of Rapid River FH and Dworshak NFH stocks to backfill broodstock shortfalls of adults trapped at the three satellite facilities, including the outplanting of adults and the transfer of eggs or fish between the Lochsa and South Fork Clearwater River populations, prevents the development of locally adapted broodstocks and natural populations, thus reducing optimum productivity and survival. Transportation of juvenile fish from Clearwater FH to release sites poses a demographic risk to the stock during transport and unknown physiological (stress) risks during transport and following release. Due to the remote locations of the three satellite facilities, icing of water intakes can occur, thus posing demographic risks to juvenile fish during acclimation prior to release. The physical design and location of the acclimation facilities poses some human safety risks during periods of high flow

Recommendations for current program: The Review Team identified 21 specific recommendations to reduce risks and/or improve benefits of the current spring Chinook program at Clearwater FH. These recommendations include: (a) establishment of a long-term, agreed-upon Master Plan for reintroducing spring in the Clearwater River basin that includes specific goals and objectives for reestablishing naturally spawning populations; (b) discontinuation of backfilling practices for the Powell-Lochsa and S.F. Clearwater stocks with spring Chinook from Rapid River and Dworshak NFH - including termination of exchanging eggs or fish between broodstocks and/or watersheds - so that two locally adapted broodstocks for the Lochsa and South Fork Clearwater rivers can be established; (c) construct shade covers for the adult holding ponds at the Red River Satellite facility to provide temporary relief from warm water temperatures during the summer; and (d) work with engineers to retrofit the satellite facilities to reduce demographic risks to fish and safety risks to personnel.

Alternatives to current program: The Review Team considered the pros and cons of seven alternatives to the existing spring Chinook program at Clearwater FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Clearwater FH and decommissioning the facility (Alternative 7). The Review Team recommends Alternative 5 which focuses on reestablishing naturally spawning spring Chinook in the Lochsa, Selway and South Fork Clearwater rivers and emphasizes harvest augmentation in the North Fork and Lower Mainstem of the Clearwater River, rather than trying to achieve both harvest and conservation goals at each release site simultaneously. The Team recommends that comanagers develop a Spring Chinook Master Plan for the Clearwater River to define and optimize achievement of conservation goals and development of localized broodstocks at the satellite facilities while increasing harvest opportunities on hatchery-origin fish in the North Fork and lower mainstem of the Clearwater River. Smolt releases in the lower areas of the Middle, South, and/or North Fork Clearwater rivers should be explicitly to support harvest, while releases at the satellite facilities should be exclusively for the conservation and the reestablishment of naturally spawning populations in the upper portions of the respective watersheds until conservation goals are achieved. The Review Team concluded that the overall management strategy for spring Chinook in the Clearwater River, coupled with the absence of well defined conservation goals or plan, creates conflicts between harvest and restoration and/or recovery of natural populations.

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Magic Valley Fish Hatchery

Facility overview: Magic Valley FH is located in the the Thousand Springs area of the Snake River, seven miles northwest of Filer, Idaho. The hatchery is operated by IDFG though a cooperative agreement with the Service under the LSRCP. Magic Valley FH was authorized under LSRCP through the Water Resources Development Act of 1976, Public Law 94-587, to mitigate for fish losses caused by the construction and operation of four hydropower dams on the lower Snake River. The hatchery diverts water from Crystal Springs (59°F water), which is part of the Thousand Springs located on the north shore of the Snake River. The output of this spring is greatly diminished and continues to decline due to water level decline in the Eastern Snake Plain Aquifer. The primary purpose of the hatchery is mitigate for steelhead losses in the Salmon River and its tributaries associated with four “run-of-the-river” hydroelectric and transportation dams on the lower Snake River in Washington State.

B-run Steelhead

Program overview: The program operates as a *segregated harvest* outplanting program within the Salmon River watershed. Magic Valley FH receives 830,000 Dworshak B-run steelhead eyed eggs annually from the Clearwater FH. Adult steelhead are trapped and spawned at Dworshak NFH. The fertilized eggs are transferred from Dworshak NFH to Clearwater FH for incubation to the eyed stage prior to transfer to Magic Valley FH. Fish are hatched and reared to the yearling smolt stage at Magic Valley FH. The hatchery transports and releases 215,000 Dworshak B-run smolts (100% with clipped adipose fins) into the Little Salmon River, 191,000 smolts (100% with clipped adipose fins) into Squaw Creek in the upper Salmon River, 60,000 smolts into Squaw Creek Acclimation Pond, and 225,000 smolts (100% with clipped adipose fins) into the lower East Fork Salmon River. An additional objective of the program is to release 60,000 Upper Salmon River B-run steelhead smolts (100% with clipped adipose fins) that are the progeny of hatchery-origin adults returning to Squaw Creek, but this latter objective has never been achieved because of the low numbers of returning adult fish resulting from the outplanting of smolts derived from adult broodstock collected at Dworshak NFH.

Benefits: The program appears to provide limited, quantified harvest benefits based on data currently available. Smolt-to-adult return rates and harvest contributions for B-run steelhead released into the Salmon River are approximately 10-15% of the return rates and contributions for A-run steelhead. For broodyears 1992 through 1999, Dworshak B-run steelhead released from Magic Valley FH into the Little Salmon River and upper Salmon River averaged 197 harvested fish/year (range = 0-331 fish/year) and 649 harvested fish/year (range 132-2,040 fish/year), respectively, for broodyears 1992 through 1999. The primary perceived benefit from the program is the sport fishery contribution of adult Dworshak B-run steelhead that are assumed to be a larger mean size when compared to adult A-run steelhead returning to the Upper Salmon River basin. Shoshone-Bannock Tribal members also harvest Dworshak B-run steelhead from Squaw Creek (5 per year) and in the lower East Fork Salmon River (up to 200 fish per year)⁷. However, the Shoshone-Bannock Tribes lack funding to properly monitor and evaluate the fishery benefits associated with releasing Dworshak B-run steelhead in the Upper Salmon River basin⁸. The operation of this program may reduce tribal harvest benefits relative to the number of fish that otherwise might be available if A-run steelhead were produced instead.

⁷ Pers. comm. L. Denny, Shoshone-Bannock Tribes, 2009.

⁸ *Ibid.*

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Risks: Dworshak B-run steelhead reared at Magic Valley FH are susceptible to a host of fish health issues, including, “sore-back”, bacterial cold water disease, and an endemic strain of IHN virus. Dworshak B-run steelhead outplanted in the Salmon River basin pose a genetic risk to ESA-listed natural populations in the Salmon River basin. This risk is particularly acute in the East Fork Salmon River where IDFG conducts a conservation hatchery program for the native population of steelhead and, at the same time, outplants 225,000 Dworshak B-run steelhead in the lower portion of the East Fork with little opportunity to recapture returning adults that escape fisheries. The Team was told that considerable natural spawning of B-run steelhead does occur in the lower East Fork Salmon River downstream from the permanent weir (RM 18) where natural-origin broodstock are collected for the “East Fork Naturals” hatchery program (see below). The Team also concluded that the continued importation and outplanting of Dworshak B-run steelhead in the upper Salmon River, without the ability to trap and remove un-harvested returns was inconsistent with the development of a localized upper Salmon River steelhead broodstock and was a significant risk (particularly in the East Fork), to naturally spawning listed steelhead populations in the upper Salmon River. The Team also concluded that the risks of releasing Dworshak B-run steelhead in the Little Salmon River were substantially lower than in the East Fork and upper Salmon rivers because (a) the Little Salmon River mainstem is high gradient with little spawning habitat available and (b) the highest quality habitat within the watershed occurs in the Rapid River which is protected from stray hatchery fish by a barrier weir used to collect spring Chinook broodstock for the Rapid River FH.

Recommendations for current program: The Review Team identified 34 specific recommendations to reduce risks and/or improve benefits of the current B-run steelhead program at Magic Valley FH. These recommendations include: (a) either extensively modify the existing Squaw Creek pond and trapping facility to facilitate broodstock collection and development of a localized broodstock or abandon the facility and relocate smolt releases and broodstock collection to another location (e.g., Pahsimeroi FH) with a higher likelihood of trapping sufficient numbers of returning adults for developing a localized upper Salmon River broodstock; (b) terminate releases of Dworshak B-run steelhead into the East Fork Salmon River and resume only if an adequate weir can be constructed near its mouth; (c) properly mark and identify Dworshak B-run steelhead released into the Little Salmon River to assess straying risks to natural populations; (d) continue to assess return rates, contributions to harvest, and size-class distributions of adult B-run steelhead returning to the Salmon River to test management assumptions and document presumed benefits; (e) develop protocols (sampling, marking, etc.) for estimating and monitoring the abundance and productivity of natural populations of steelhead in the Salmon River basin so that the risks and benefits of the hatchery program can be better assessed; (f) increase testing for the prevalence of *Nucleospora salmonis* at Magic Valley FH; and (g) investigate the source of IHN virus at the hatchery and take preventive measures to reduce fish health risks (e.g., disinfection of the water supply to the incubation building, enclosing Crystal Springs to prevent access by birds and mammals, and additional precautionary measures to inhibit transmission of the virus into the water supply).

Alternatives to current program: The Review Team considered the pros and cons of seven alternatives to the existing B-run steelhead program at Magic Valley FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Magic Valley FH and decommissioning the facility (Alternative 7). The Review Team recommends either (a) Alternative 2, terminate the transfer and outplanting of Dworshak B-run steelhead in the upper Salmon River and develop a locally adapted broodstock for maintaining a segregated harvest program for B-run steelhead in the upper Salmon River, or (b) Alternative 5, terminate the B-run steelhead program and increase the size of the A-

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run steelhead program at Magic Valley FH to a size comparable to the current combined sizes of the A-run and B-run programs. The Review Team concluded that the direct release of Dworshak B-run steelhead in the East Fork Salmon River - under current conditions - creates significant biological risks to other populations of steelhead in the Salmon River and directly conflicts with the management goal of maintaining a native population in the East Fork (see East Fork Naturals program below). The Team accepts the current management rationale and comparatively low risks of releasing Dworshak B-run steelhead into the Little Salmon River; however, the Team recommends the rearing of those fish at Clearwater FH rather than Magic Valley FH or Hagerman NFH to reduce fish health risks, improve smolt quality, and reduce risks associated with transportation.

A-run Steelhead

Program overview: The program operates as a *segregated harvest* outplanting program within the Salmon River watershed. Magic Valley FH receives a combined total of nearly 1.0 million eyed eggs from Sawtooth FH and Pahsimeroi FH, but the relative numbers received from each hatchery can vary from year to year. For broodyear 2007, Magic Valley FH received 480,000 eyed eggs from Sawtooth FH and 480,000 eyed eggs from Pahsimeroi FH. From eyed eggs obtained from Sawtooth FH, Magic Valley FH transports and releases 90,000 smolts (30,000 with unclipped adipose fins) into the Yankee Fork Salmon River and 50,000 smolts (all with unclipped adipose fins) into Valley Creek. From eyed eggs obtained from Pahsimeroi FH, the hatchery transports and releases 90,000 smolts into Slate Creek (30,000 smolts with clipped adipose fins), 200,000 smolts (100% with clipped adipose fins) into the mainstem Salmon River upstream and downstream of the Lemhi River (divided between two sites), and 30,000 smolts (100% with clipped adipose fins) into the Pahsimeroi River at the hatchery. From eyed eggs obtained from either Sawtooth or Pahsimeroi fish hatcheries, Magic Valley FH releases 320,000 smolts (100% with clipped adipose fins) into the mainstem Salmon River upstream (2 sites) and downstream (1 site) of the Pahsimeroi River (smolts are divided among three sites). None of the fish reared at Magic Valley FH and outplanted into the Salmon River are required for broodstock at either Sawtooth or Pahsimeroi hatcheries when those fish return to the Salmon River as adults.

Benefits: Data on harvest contributions of A-run steelhead reared at Magic Valley FH and released into the Salmon River are limited. Pahsimeroi A-run steelhead reared at Magic Valley FH and released into the upper Salmon River yielded a mean harvest of 2,667 fish/year (range = 566-4,815 fish/year) for broodyears 1992 through 1999. Sawtooth A-run steelhead reared at Magic Valley FH and released into the upper Salmon River yielded a mean harvest of 2,884 fish/year (range = 2,704-3,063 fish/year) for broodyears 1997 and 1999. Pahsimeroi A-run steelhead reared at Magic Valley FH and released into the Little Salmon River yielded a mean harvest of 107 fish/year (range = 82-132 fish/year). Sport fisheries during the 2001-2002 steelhead season (both A and B-run) resulted in approximately 22,000 angler-days on the Snake River, 15,000 angler-days on the Little Salmon River, and 148,000 angler-days on the Salmon River. For the 2002-2003 season, those numbers were 18,000, 18,000, and 145,000 angler-days, respectively. Potential conservation benefits can result from the natural spawning of hatchery-origin A-run steelhead in Slate Creek, Valley Creek, and Yankee Fork Salmon River if reproduction is successful.

Risks: Adult steelhead trapped and spawned at Sawtooth FH and Pahsimeroi FH have a common ancestry, but the two groups of fish are now managed as two distinct populations and are largely self-sustaining with adults returning to the respective facilities. In the past, egg shortages at one facility have been backfilled with surpluses at the other facility, or with surpluses at Oxbow FH (Idaho Power facility) on the mainstem Snake River. If backfilling occurs in the future, then it

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would pose a genetic risk to the recipient population by impeding development of locally-adapted characteristics that are expected to maximize viability and productivity. In addition, outplanting Sawtooth FH steelhead into mainstem areas of the Salmon River downstream from the Pahsimeroi River poses additional genetic risks to maintenance of a locally adapted broodstock at Pahsimeroi FH because of the high likelihood that returning adults escaping fisheries will stray into the Pahsimeroi River. These outplants also pose straying risks to ESA listed natural populations in the upper Salmon River (e.g., Lemhi River). The outplanting of large numbers of steelhead smolts (both A-run and B-run) poses competition risks to natural-origin steelhead in the Salmon River. The rearing of multiple stocks of steelhead at Magic Valley FH (Sawtooth A-run, Pahsimeroi A-run, Dworshak B-run, and “East Fork Naturals”) imposes culture risks at a facility not designed to rear multiple stocks of fish.

Recommendations for current program: The Review Team identified 12 specific recommendations to reduce risks and/or improve benefits of the current A-run steelhead program at Magic Valley FH. These recommendations include the following: (a) establish measurable, numeric conservation goals for rebuilding natural populations of steelhead in Slate Creek, Valley Creek, and Yankee Fork Salmon River, and develop an HGMP9 for those programs that includes a monitoring and evaluation plan for assessing progress towards those goals; (b) discontinue rearing Sawtooth A-run steelhead at Magic Valley FH (approximately 400,000 smolts), rear all Sawtooth A-run steelhead released in the Salmon River at Hagerman NFH, and transfer the responsibility of rearing 200,000 Pahsimeroi A-run steelhead from Hagerman NFH to Magic Valley FH; (c) preclude backfilling egg take shortages at Sawtooth or Pahsimeroi hatcheries that involves releasing at each facility the progeny of adults trapped at the other facility, or backfilling broodstock shortages at Sawtooth or Pahsimeroi hatcheries with eggs from adults trapped at Oxbow FH; (d) discontinue the release of Pahsimeroi A-run steelhead in the mainstem Salmon River where opportunities to recapture unharvested adults are not present and where unharvested hatchery-origin fish have a high likelihood of straying into natural reproduction areas (e.g., Lemhi River); and (e) mark or tag all A-run steelhead reared at Magic Valley FH and released in the Salmon River basin.

Alternatives to current program: The Review Team considered the pros and cons of four alternatives to the existing A-run steelhead program at Magic Valley FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Magic Valley FH and decommissioning the facility (Alternative 4). The Review Team recommends implementation of Alternative 1: retention of the current A-run steelhead program with implementation of all program-specific recommendations. This recommendation includes rearing only Pahsimeroi A-run steelhead at Magic Valley FH and rearing all Sawtooth A-run steelhead at Hagerman NFH. Advantages of this alternative improves local adaptation of the broodstock, improves fish culture efficiency, decreases disease risks, and maintains the existing level of fishing opportunity for A-run steelhead in the Salmon River and in downriver fisheries.

East Fork Salmon River “Naturals” Steelhead

Program overview: The program operates as an *integrated conservation* program to help maintain and recover the native population of steelhead in the East Fork Salmon River. Fishery biologists believe that the East Fork Salmon River historically supported the highest elevation and farthest

⁹ *Hatchery and Genetic Management Plan, as required by NOAA Fisheries, for assessing the biological risks of hatchery programs on ESA listed populations of Pacific salmon and steelhead.*

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upstream native population of anadromous steelhead within the Salmon River basin. The hatchery program was initiated with brood year 2000, with smolts first released in 2001 and adult returns beginning in 2003. Up to 30 natural-origin (unmarked and untagged) steelhead are trapped annually with the intent of spawning 10 females and ultimately producing 50,000 smolts. Adults are trapped and spawned at a permanent weir located at RM 18 of the East Fork Salmon River. Eggs are fertilized at the weir and transported to Sawtooth FH for incubation to the eyed stage. Eyed eggs are transported from Sawtooth FH to Magic Valley FH where the eggs are hatched and the resulting fish are reared to the smolt stage. All fish are tagged with coded-wire tags but not marked (no adipose fin clips) prior to transport and release as yearling smolts at the weir trap on the East Fork Salmon River. Recent (1984-2001) returns of natural-origin steelhead to the East Fork Salmon River weir have ranged from 0 to 40 natural fish/year. A mean of 28 natural-origin adult steelhead per year were trapped at the weir, 1987-2007. The program participates in the Idaho Supplementation Studies to determine whether hatchery propagation can be used to increase the abundance of natural-origin steelhead in the East Fork Salmon River.

Benefits: The hatchery program reduces the risk of extinction of the steelhead population native to the East Fork Salmon River by providing a demographic buffer to stochastic variations in abundance and survival. The program will confer a conservation benefit to the natural population if supplementation spawning by hatchery-origin fish is successful and the number of natural-origin adult steelhead returning annually increases. However, the program has struggled to achieve its release objective of 50,000 smolts because of the generally insufficient numbers of natural-origin adults trapped at the East Fork weir each year. However, in 2007, high numbers of adult steelhead at the East Fork trap resulted in 150,000 hatchery-origin smolts in 2008. Fish in excess of the program objective (50,000 smolts) were outplanted into Slate and Valley creeks.

Risks: Although the program provides a demographic benefit to the East Fork population of steelhead, it also poses a demographic risk via “broodstock mining” (removing adult fish from a natural population already at low abundance), including the possibility for a catastrophic loss of all the hatchery produced eggs or fish of a particular brood year during incubation, rearing, or transportation. The transfer and release of approximately 100,000 hatchery-produced smolts to Slate and Valley creeks outside the watershed - when those smolts represented the progeny of natural-origin adults trapped in the East Fork - is inconsistent with the conservation goals for the program, thus increasing genetic and demographic risks to the population compared to the alternative approach of releasing all smolts in the East Fork. Significant numbers of steelhead spawn below the weir; consequently, the current location of the weir and trap at RM 18 prevents adequate conservation management of a listed natural population below the weir, the habitat for which is believed to be of higher quality than the habitat upstream of the weir. The staff quarters at the East Fork Salmon weir and trap do not comply with National Fire Protection Association standards; therefore, staff cannot reside at the site which poses a security risk to the facility and, during periods of broodstock collection, a poaching risk to fish trapped and held at the facility.

Recommendations for current program: The Review Team identified seven specific recommendations to reduce risks and/or improve benefits of the current East Fork Naturals steelhead program at Magic Valley FH. These recommendations include the following: (a) release hatchery-origin smolts further upstream to promote upstream migration and spawning with the natural population above the weir; (b) determine the feasibility of constructing a new weir or moving the existing weir to near the mouth of the East Fork; and (c) construct adequate staff quarters that comply with current regulations, and (d) install a water flow and security alarm system capable of notifying staff on site or off site.

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Alternatives to current program: The Review Team considered the pros and cons of four alternatives to the existing “East Fork Naturals” steelhead program at Magic Valley FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Magic Valley FH and decommissioning the facility (Alternative 4). The Review Team recommends implementation of Alternative 3: expand the East Fork Naturals program to include a 2nd, “stepping stone broodstock” for producing fish that can replace (a) the Dworshak B-run steelhead released in the lower East Fork and (b) the Sawtooth and Pahsimeroi A-run steelhead that are released in the mainstem Salmon River downstream from the East Fork and upstream of the Pahsimeroi River. Advantages of this alternative are: (a) reduces genetic risks and allows increased numbers of hatchery-origin fish to serve as a genetic reserve for the listed East Fork Salmon River population; (b) contributes to sport and tribal harvest on hatchery-origin fish with low straying risks; and (c) is consistent with population designations of the Interior Columbia Technical Recovery Team (ICTRT) for the Salmon River Major Population Group. Implementing this alternative would be enhanced if a new weir is constructed closer to the mouth of the East Fork Salmon River.

Sawtooth Fish Hatchery

Facility overview: Sawtooth FH is located on the Salmon River five miles south of Stanley, Idaho adjacent to State Highway 75. The hatchery was constructed in 1985 as part of the LSRCP to mitigate for fish losses associated with the construction and operation of four mainstem dams on the lower Snake River. Sawtooth FH consists of an incubation and early rearing room, six small outside raceways, 14 large outside raceways, and an adult spawning facility. The Salmon River and three production wells supply fish culture water to the hatchery. River water is distributed to indoor vats, outside raceways and the adult spawning facility. Well water is used for egg incubation and early-rearing of hatched fry. In addition to the two LSRCP programs described below, the facility also traps and rears sockeye salmon as part of the ESA recovery plan for the endangered *Snake River Sockeye Salmon ESU*. Catchable rainbow trout and native westslope cutthroat trout are also held at the hatchery for stocking into lakes and streams.

Spring Chinook

Program overview: The program operates primarily as a *segregated harvest* program to support recreational and tribal fisheries in the Salmon River. The current population of spring Chinook propagated at Sawtooth FH was derived from fish native to the upper Salmon River. Trapping and spawning of adults, and all hatching and rearing occurs on station at the hatchery. The original intent of the program was to release a total of 2.3 million yearling smolts: 1.3 million smolts at Sawtooth FH, 700,000 smolts in the East Fork Salmon River, and 300,000 smolts in Valley Creek, each maintained by separate broodstocks. However, rearing capacity at the hatchery is limited by the quantity of pathogen free well water available during early rearing, and the Valley Creek component was never initiated. Adult spring Chinook were collected for broodstock from the weir on the East Fork Salmon River (RM 18), 1984 to 1993, but the East Fork program was terminated in 1998 due to poor adult returns, with the last release of smolts occurring in 1995. The current stated objective is to release 1.0 million spring Chinook yearling smolts at 15 fish per pound (fpp) into the upper Salmon River at Sawtooth FH (as per the current US v OR agreement). This release objective was modified by agreement of Idaho Fish and Game, the Shoshone-Bannock Tribes, and the Service to 1.7 million smolts (for brood year 2008 only) based on a reassessment of the capacity at Sawtooth FH and availability of returning adults during the 2007 adult return season. To meet the 1.7 million smolt release objective, the hatchery must trap and retain 450 females and

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450 males for broodstock to have sufficient numbers of adults for pairwise spawning. These latter numbers include jacks (age 3 males) and accounts for pre-spawning mortality. These broodstock numbers have only been achievable recently. From 1998 through 2007, an average of only 118 males greater than age 3 (range = 3-375 males), 30 jacks or age 3 males (range = 2-84 jacks), and 160 females (range = 12-434 females) were spawned annually at Sawtooth FH. No specified conservation goal has been identified for this hatchery program, although the hatchery participates in the Idaho Supplementation Studies to assess the natural-spawning productivity effects of hatchery-origin spring Chinook released upstream of the weir at the Sawtooth FH.

Yankee Fork Salmon River program: Pending a management agreement under US v Oregon, spring Chinook smolts at 15 fpp are released into Yankee Fork Salmon River as part of a supplementation project of the Shoshone-Bannock Tribes to restore a naturally spawning population and support harvest by the Tribes. In 2006, approximately 136,000 spring Chinook smolts (BY 2004) from the Sawtooth FH were released into Yankee Fork Salmon River. Due to low adult returns, no smolts were (or will be) released in Yankee Fork Salmon River from 2007 through 2009. The parties have agreed to complete an approved Hatchery and Genetic Management Plan (HGMP) for Yankee Fork Salmon River prior to collection of BY2009 broodstock. This HGMP will define the Yankee Fork Salmon River spring Chinook program and address its relationship to the Sawtooth FH spring Chinook program.

Benefits: The upper Salmon River was open for sport fishing of spring Chinook salmon in 2008 for the first time since 1978. Preliminary 2008 sport harvest data from IDFG estimated anglers fished a total of 13,744 hours in the upper Salmon River, caught 994 spring Chinook, kept 388 adults and 282 jacks, and released 324 Chinook. For 2008, a total of 4,355 spring Chinook had been trapped at Sawtooth FH through August 19. Preliminary 2008 harvest estimates by the Shoshone-Bannock Tribes were 28 natural-origin and 400 hatchery-origin spring Chinook in the upper Salmon River. Adult returns of hatchery-origin spring Chinook to Sawtooth FH have averaged 724 fish per year (range = 26-1,535 fish/year), and unmarked adults returns - assumed to be natural origin fish - have averaged 420 fish per year (range = 121-863 fish/year) for brood years 1997 through 2005. The hatchery program acts as a genetic repository and demographic buffer for ESA-listed, upper Salmon River spring Chinook. Tribal harvest provides subsistence and cultural benefits to the Shoshone-Bannock Tribes

Risks: Continued propagation of Sawtooth FH spring Chinook as a genetically-segregated hatchery population poses a domestication risk to the population as a genetic repository for the naturally spawning upper Salmon River population. This risk coupled with the continued outplanting of smolts into the Yankee Fork Salmon River inevitably will pose long-term genetic and ecological risks to the naturally spawning population. Early rearing densities in the indoor nursery tanks exceed guidelines for spring Chinook (DI = 0.3), posing a fish health risk to the propagated stock. The capacity of the diesel fuel supply tank for the electric generator at Sawtooth FH (50 hours) is insufficient to meet potential needs because of the remote, high elevation location of the hatchery and susceptibility to prolonged power outages from winter storms; a demographic risk of catastrophic fish or egg losses thus exists at the hatchery. The water intake for the hatchery is prone to icing in the winter, confounding the risk of catastrophic fish losses if a power failure occurs and well water is not available for de-icing.

Recommendations for current program: The Review Team identified 34 specific recommendations to reduce risks and/or improve benefits of the current spring Chinook program at Sawtooth FH. These recommendations include the following: (a) consider re-implementing the East Fork Salmon River program if it has potential conservation or harvest merit under current

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return rates for spring Chinook in the upper Salmon River; (b) develop conservation and escapement goals for the upper Salmon River upstream of the Sawtooth FH weir to meet ESA and comanager goals and objectives; (c) preclude adult, hatchery-origin spring Chinook from the current segregated broodstock from passage upstream of the hatchery weir, even after the Idaho Supplementation Studies are complete in 2012; (e) increase the well water supply and number of nursery tanks in the incubation room, or reduce the number of spring Chinook salmon reared at Sawtooth FH, to comply with recommended density index guidelines; (f) consult with engineers to evaluate several structural or operational problems associated with the water intake and weir; (g) increase the capacity of the diesel fuel storage tank for the emergency generator; and (h) adopt annual operations plans (AOPs) more similar to those used in Oregon and Washington to deal with unexpected contingencies that may conflict with stated goals and objectives.

Alternatives to current program: The Review Team considered the pros and cons of five alternatives to the existing spring Chinook program at Sawtooth FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at Sawtooth FH and decommissioning the facility (Alternative 5). The Team recommends Alternative 3: development of a two-broodstock, stepping stone program with (a) an *integrated* spring Chinook broodstock to meet conservation goals and reduce genetic domestication risks and (b) a second, significantly larger broodstock - based on returning adults from the first broodstock - to meet harvest goals. Progeny of the first broodstock would be tagged but unmarked, while progeny of the second broodstock would all be marked with adipose fin clips.

Yankee Fork Salmon River program: The Review Team also considered the pros and cons of four alternatives to the existing spring Chinook program for the Yankee Fork Salmon River, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of support for the program (Alternative 4). The Team recommends Alternative 1: continuation of the current program with implementation of all recommendations. The Team believes that the current management strategy for spring Chinook in the Yankee Fork Salmon River, as prescribed under Alternative 1, is a sound approach for developing and maintaining tribal harvest opportunities in the area and achieving long-term conservation goals. This program is expected to transition to a locally-adapted broodstock as appropriate collection facilities and adequate adult returns become available.

A-run Steelhead

Program overview: The program operates primarily as a *segregated harvest* program to support recreational and tribal fisheries in the upper Salmon River watershed. The current stock of steelhead propagated at Sawtooth FH was derived from the Pahsimeroi FH stock which, in turn, was derived from natural-origin adults trapped at Hells Canyon Dam, 1966-1970. The hatchery attempts to trap and spawn 525 pairs of hatchery-origin adult steelhead annually with the goal of producing 2.13 million eyed eggs. Eyed eggs are shipped to Hagerman NFH and Magic Valley FH for hatching and rearing of the resulting fish to the yearling smolt stage. In 2008, Hagerman NFH and Magic Valley FH were scheduled to receive 1.15 million and 480,000 eyed eggs, respectively. In addition, Sawtooth FH provides 500,000 eyed eggs to the Shoshone-Bannock Tribe for streamside incubator projects in Yankee Fork Salmon River and other tributaries to the upper Salmon River. Sawtooth A-run steelhead reared at Hagerman NFH are released (a) at the weir adjacent to the hatchery (810,000 smolts) in the upper Salmon River (100% with clipped adipose fins) to support fisheries in the upper basin and provide adult returns for broodstock and (b) the Yankee Fork Salmon River (240,000 smolts) to support fisheries (100,000 with clipped adipose

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fins) and a natural-spawning supplementation program (200,000 with un-clipped adipose fins) of the Shoshone-Bannock Tribes. Sawtooth A-run steelhead reared at Magic Valley FH are outplanted at several sites in the mainstem Salmon River (up to 320,000 smolts) to support fisheries and in Yankee Fork Salmon River (90,000 smolts) and Valley Creek (50,000) to further support natural spawning supplementation projects of the Shoshone-Bannock Tribe.

Benefits: Benefits of the A-run steelhead program at Sawtooth FH have been described partially under the A-run steelhead programs for Magic Valley FH (this report) and Hagerman NFH (companion National Fish Hatchery report for the Snake River). As noted previously, quantified data on harvest benefits from these programs are limited. Sawtooth A-run steelhead reared at Magic Valley FH and released into the upper Salmon River yielded a mean harvest of 2,884 fish/year (range = 2,704-3,063 fish/year) for broodyears 1997 and 1999. Estimated number of hatchery-origin A-run steelhead returning to the upper Salmon River (harvest + escapement) from releases at Sawtooth FH (Sawtooth and Pahsimeroi stocks combined) averaged 5,098 adults (range = 2,504-11,612 adults) for brood years 1992 through 1999. Of these latter adult returns, the number of adult steelhead harvested averaged 3,371 fish (range = 1,503-7,405 fish). This program confers harvest and cultural benefits to the Shoshone-Bannock Tribes for subsistence. The natural-spawning supplementation project in the Yankee Fork Salmon River further supports the historical and cultural practices of the Shoshone-Bannock Tribes. These supplementation projects also provide research benefits and have the potential of conferring conservation benefits – if successful - by establishing naturally spawning populations in tributaries of the upper Salmon River. Operation of the weir at Sawtooth FH provides a research benefit via monitoring and evaluation assessments of upstream migrating salmonids (e.g., bull trout). Stanley, Idaho is a recreational and tourist destination, and the hatchery has a well developed visitors' center and receives up to 50,000 visitors per year.

Risks: Genetic and ecological risks of outplanting A-run steelhead in the mainstem Salmon River have been described previously under the A-run steelhead programs for Magic Valley FH. The release of large numbers of non-native, hatchery-origin steelhead smolts at the hatchery weir and in the Yankee Fork Salmon River poses some genetic risks to native populations of resident rainbow trout in the upper Salmon River basin. These releases may also pose ecological risks to native populations of resident fishes. An intense recreational fishery occurs on adult steelhead immediately downstream of the hatchery at the time smolts are released at the weir, thus posing an incidental harvest-mortality risk on downstream migrating smolts. The presence of pathogens (e.g., IHN virus) in the Salmon River pose a disease risk to steelhead during egg incubation. A redundancy in the water supply allows a safety valve to open and divert river water to the incubation room to keep the eggs and fry alive when standby power fails and no longer can delivery well water.

Recommendations for current program: The Review Team identified two specific recommendations to reduce risks and/or improve benefits of the current A-run steelhead program at Sawtooth FH not described previously for the spring Chinook program at Sawtooth FH or for the A-run steelhead programs at Magic Valley FH and Hagerman NFH. These recommendations include the following: (a) implementation of emergency fish health discussions and actions if IHN virus - which is present in the water supplies in the Hagerman Valley - is detected among A-run steelhead during pre-release examinations at Hagerman NFH or Magic Valley FH; and (2) evaluation of the impact of recreational fisheries and incidental harvest mortality on steelhead smolt outmigrants and the overall smolt-to-adult survivals of steelhead released in the Salmon River, including potential impacts of those fisheries on meeting LSRCP adult return goals.

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Alternatives to current program: Alternatives to the current A-run steelhead program at Sawtooth FH are covered under the corresponding Alternative sections for A-run steelhead programs at Magic Valley FH (this report) and Hagerman NFH (companion National Fish Hatchery report for the Snake River).

McCall Fish Hatchery

Facility overview: McCall FH is located on the south side of the city of McCall, Idaho on 15 acres of land approximately 1/4-mile downstream of Payette Lake adjacent to the North Fork of the Payette River. The hatchery was renovated by the U.S. Army Corps of Engineers in 1979 to propagate summer Chinook salmon for the LSRCP. Payette Lake is the water source for McCall FH. Two water intakes are available, which provide limited water temperature control through mixing. The surface intake is located at Lardo Dam at the outlet of Payette Lake. The subsurface intake is located approximately 1/4-mile into the lake at a depth of 50 feet. A 2-foot diameter constriction in the 3-foot diameter mainline limits maximum flow. A satellite adult trapping facility, about 50 miles from McCall, Idaho near Cabin Creek on the South Fork Salmon River (the “South Fork Salmon River Satellite Facility”), was reconstructed in 2007 and is used to trap summer Chinook adults for the hatchery program at McCall FH. Funding for the salmon (anadromous fish) program is obtained via the LSRCP. The facility also rears and outplants 55,000 “catchable” rainbow trout to the local waters and up to 250 high-mountain lakes annually. Funding for the rainbow trout program is obtained from the sale of sport fishing licenses.

Summer Chinook

Program overview: The summer Chinook program at McCall FH began in 1978 under the LSRCP. The program currently operates primarily as a *segregated harvest* program to support recreational and tribal fisheries in the South Fork Salmon River. The current population of summer Chinook propagated at McCall FH was derived from fish native to the South Fork Salmon River supplemented with adult salmon trapped at the lower Snake River dams during the first three years of the program. Trapping and spawning of adults occurs currently at the South Fork weir. The program attempts to trap and retain approximately 450 females and 900 males for broodstock each year with the goal of spawning 385 females. Eggs are fertilized at the satellite facility, water-hardened, and then transported to McCall FH for incubation. Eggs are hatched and the resulting fish are reared to the yearling smolt stage at the hatchery. Yearling smolts are then transported and released directly into the South Fork Salmon River at the Knox Road Bridge, approximately 1 mile upstream of the weir. The program objective is to release 1.0 million yearling smolts annually in the S.F. Salmon River. McCall FH also provides fish rearing space for the Johnson Creek summer Chinook supplementation program of the Nez Perce Tribe.

Benefits: Summer Chinook reared at the McCall FH and released into the S.F. Salmon River contributed the following estimated number of harvested adult fish in 2004 based on recovery of coded wire tags: 1,168 fish in tribal fisheries on the mainstem Columbia River, and 2,591 sport-caught and 982 tribal-caught fish in the lower Salmon and S.F. Salmon rivers. In addition, 356 hatchery-origin fish (carcasses) were recovered above the South Fork Salmon River weir during spawning ground surveys, and 5,594 fish were recovered at the South Fork weir in 2004. Sport fisheries for summer Chinook on the South Fork Salmon River occurred in 1997, and 2000 through 2008. During those fisheries (excluding 2008), an average of 36,017 angler-hours/year (range = 9,289-80,948 angler-hours) resulted an average catch of 5,579 fish/year (range = 531-14,292 fish) with an average harvest of 2,722 fish/year (range = 364-6,843 fish). McCall FH

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summer Chinook contribute to Nez Perce and Shoshone-Bannock tribal fisheries in the South Fork Salmon River, nearly all of which occurs downstream of the weir. Tribal harvests confer subsistence and cultural benefits to the Nez Perce Tribe and Shoshone-Bannock Tribes, and tribes that fish the mainstem Columbia River.

Risks: Continued propagation of McCall FH summer Chinook as a genetically-segregated hatchery stock poses a domestication risk to the population, thus reducing the potential of hatchery-origin fish to serve as a genetic repository for the native South Fork Salmon River population. The high proportion of summer Chinook composed of hatchery-origin fish spawning downstream of the S.F. weir poses a genetic risk to the natural population. “Recycling” hatchery-origin summer Chinook trapped at the weir to downstream locations to support fisheries further increases genetic risks to the natural population. The location of the South Fork satellite facility weir between the two primary spawning areas for summer Chinook (Poverty Flats and Stolle Meadows) poses a demographic risk to the natural population by potentially shifting the distribution of natural spawners in the South Fork Salmon River. The high proportion of naturally-spawning fish composed of hatchery-origin adults downstream of the weir may be masking the true viability status of the natural population, thus posing a demographic risk. Hatchery-origin fish representing strays compose greater than 5% of the naturally spawning summer Chinook in the Secesh River (a tributary to the S.F. Salmon River), thus posing a genetic risk to the Secesh River Chinook population. Trapping and holding adult summer Chinook in excess of the rated pond capacity of the South Fork satellite facility poses a fish health risk to the fish held for broodstock. Incubating fertilized eggs from multiple Chinook salmon females in a single incubation tray at McCall FH increases fish health risks associated with bacterial kidney disease (BKD).

Recommendations for current program: The Review Team identified 25 specific recommendations to reduce risks and/or improve benefits of the current summer Chinook program at McCall FH. These recommendations include the following: (a) develop conservation and escapement goals for the natural population of summer Chinook in the South Fork Salmon River to meet ESA and comanager goals for recovery; (b) discontinue passing hatchery-origin summer Chinook upstream of the S.F. weir, even after Idaho Supplementation Studies are complete in 2012; (c) maximize selective harvest of hatchery-origin summer Chinook in the South Fork Salmon River, consistent with ESA incidental take limits, and discontinue the recycling of hatchery-origin fish below the weir and, instead, provide those fish directly to the tribes or other potential user groups (e.g. food banks, community); (d) modify spawning protocols and improve record keeping to minimize the use of males more than once, and better document their individual contributions to fertilizations; and (e) incubate the fertilized eggs from each female in separate trays prior to pathology tests for BKD to minimize disease risks.

Alternatives to Current Program: The Review Team considered the pros and cons of six alternatives to the existing S.F. Salmon River summer Chinook program at McCall FH, ranging from (a) the current program with full implementation of all program specific recommendations (Alternative 1) to (b) termination of all programs at McCall FH and decommissioning the facility (Alternative 6). The Team recommends Alternatives 3 or 4: either (a) development of a two-broodstock, stepping-stone program with the integrated first broodstock derived from natural-origin fish trapped at the South Fork weir and integrated with the Stolle Meadows natural population upstream of the weir (Alternative 4) or (b) a stepping-stone program with the integrated first broodstock derived from natural-origin adults trapped at the weir and in the natural spawning area below the weir at Poverty Flats. The Review Team believes that Alternative 4 best serves the conservation goals of preserving the native stock of the South Fork Salmon River

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(upstream of the weir) while meeting the mitigation goals of Lower Snake Compensation Plan and supporting Tribal and recreational fisheries. Alternative 5 requires broodstock collection downstream of the South Fork weir, which the Team assumed would be very difficult as it would likely require additional trapping facilities below Poverty Flat, while Alternative 4 implicitly assumes that gene flow between the Poverty Flats and Stolle Meadows sub-populations is sufficient to allow collection of natural-origin, summer Chinook adults at the existing weir only and still allow achievement of conservation goals for summer Chinook in the SF Salmon River.

Conclusions

The Review Team concluded that a general conflict exists among harvest and conservation goals, and the hatchery programs intended to achieve those goals, for many of the LSRCP programs in Idaho. These conflicts are best exemplified by the spring Chinook and South Fork Clearwater steelhead programs at Clearwater FH, and the B-run steelhead program in the upper Salmon River, particularly in the East Fork. The Review Team strongly recommends that separate “Master Plans” be developed for each hatchery-propagated species in each watershed (e.g., spring Chinook in the Clearwater River; steelhead in the South Fork Clearwater River) where conflicts between harvest and conservation goals occur. These conflicts appear to be most acute in areas representing reintroduction programs (spring Chinook in the Clearwater River; steelhead in the South Fork Clearwater River) and areas where critical, untested assumptions are used to justify programs and management actions (e.g., B-run steelhead program in the upper Salmon River).

For example, the continued release of Dworshak B-run steelhead in the upper Salmon River for over 20 years appears to be based exclusively on the assumption that those fish – when they return to the Salmon River - are significantly larger than “A-run” steelhead released from Pahsimeroi and Sawtooth hatcheries. Although this assumption may indeed be true, the Review Team was unable to obtain data quantifying the extent to which the assumption *is* true. Perhaps more importantly, the Team was unable to obtain data demonstrating that the *absolute number* of Dworshak B-run steelhead exceeding a specified size threshold in the Salmon River is greater than the *absolute number* of A-run fish exceeding that same threshold. Indeed, the Team concluded that the release of Dworshak B-run steelhead in the upper Salmon River most likely impedes attainment of LSRCP mitigation goals and reduces overall fishery benefits because of the substantially lower smolt-to-adult return rates (SARs) of Dworshak B-run steelhead vs. A-run steelhead released in the upper Salmon River. This is not to say that the B-run steelhead program does not have “value” or provided benefits; the Team only concluded that implementation of the program and actions to maintain it appear to be based primarily on undocumented assumptions rather than documented benefits.

The Team further concluded the B-run steelhead program in the upper Salmon River - which is based on the annual transfer of eyed eggs originating from hatchery-origin adults trapped each year at Dworshak NFH on the N.F. Clearwater River - directly conflicts with a conservation hatchery program for native steelhead in the E.F. Salmon River, thus creating significant risks. From a benefits-risk perspective, the Team recommends either (a) termination of Dworshak B-run steelhead releases in the upper Salmon River or (b) immediate transfer of smolt releases to an *existing facility* with the demonstrated capability to recapture sufficient numbers of returning adults with high probability for developing a localized broodstock. The Team suggests that the Pahsimeroi FH may be the best location for achieving this latter goal.

In general, the Team recognizes that the current LSRCP programs in the Clearwater and Salmon River basins are making significant, and very important, contributions toward tribal and recreational harvests

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in those terminal areas. However, those programs are not without conflicts or significant risk to existing natural populations or the goals associated with conserving or reestablishing natural populations. The Team recommends that separate Master Plans be developed for each species and each watershed where hatchery propagation is intended to be a tool for achieving harvest and/or conservation goals. The Nez Perce Tribe's original Master Plan for reintroducing coho salmon into the Clearwater River, although it needs updating, may serve as a model document for generating similar plans for other species in the Clearwater and Salmon rivers. Hatchery and Genetic Management Plans for each hatchery program could be developed simultaneously as partial components of each species Master Plan.

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