

## Upper Salmon River Hatchery Program - Sawtooth Fish Hatchery

### **IDFG Response to the ISRP Comments**

The primary intent of this report was to describe the history and performance of the hatchery program relative to meeting the mitigation objectives for the program. Many of the comments provided by the ISRP were related to providing additional detail about the management objectives and status of the natural population. Addressing the recovery of listed natural Chinook salmon populations goes well beyond the LSRCP mitigation program and the IDFG is fully engaged in this process through the development of HGMPs, TRT viability assessments, consultations with NOAA Fisheries, and incorporating adaptive management actions to the hatchery programs.

One thing that is apparent from the ISRP comments is the misunderstanding that the management objective for the hatchery program is to restore the natural population. While the IDFG statewide management objectives include maintaining and restoring natural populations, this hatchery program has been managed primarily to meet harvest mitigation objectives. As a result of declining hatchery and natural populations of spring Chinook salmon populations and the impending listing of the Snake River spring Chinook salmon in the early 1990s, IDFG developed a multigenerational experiment to evaluate the use of a supplementation strategy to increase the number of naturally produced adults. The initiation of this study was based on the uncertainty of supplementation effectiveness and its impacts to natural populations. At the beginning of this evaluation (BY1991), IDFG implemented mass-marking of hatchery produced Chinook that allowed the differentiation of hatchery and natural fish. At the same time, IDFG also implemented the use of segregated broodstocks to reduce potential impacts to the natural populations.

More recently, IDFG has implemented changes in the hatchery program that resulted from two regional hatchery review processes. These reviews reflect the current state of knowledge regarding best management practices for anadromous hatchery programs. As part of the recommendations, IDFG has implemented the development of an integrated broodstock and a weir management that is based on a sliding scale of natural origin adult abundance.

***ISRP comment #1 from the Introduction*** *The broodstock history and AP strategy for the USR has changed several times since the program's inception. This has made it impossible to estimate the contributions of the USR and Rapid River founding stocks and difficult to evaluate the program. Prior to 1995 the program was a de facto integration/supplementation program with both hatchery- and natural-origin adults incorporated into the broodstock and also released above the weir to spawn naturally. In recent years, the program has swung from focusing on segregated hatchery origin broodstock (1995-2009) to an integrated stepping-stone broodstock protocol, which was initiated in 2010.*

**IDFG Response to Comment #1-** Detail has been added to this section in the body of the report to better describe this broodstock history and direction. To be clear, the "broodstock history" has not changed

since the program's inception. The LSRCP mitigation program in the USR began in 1981 with adult collections from a temporary weir at the current site of Sawtooth Fish Hatchery. Since 1981, broodstock for the USR hatchery program has been exclusively from USR returns. The proportion of hatchery- and natural-origin adults contributing to broodstocks has varied over the years, for reasons explained in the narrative, but has consistently been of USR stock. The original program strategy was more similar to what today managers refer to as an integrated program. Actual SARs experienced by both hatchery and natural fish were far less than those modeled to establish the original program strategy. Declines in all stocks as a result of poor SARs and ESA listing in 1992 resulted in the adaptive management shift to a segregated hatchery program for the harvest mitigation program.

***ISRP comment #2 from the Management and Monitoring/Evaluation Objectives section-*** *It is not clear how the actions in this program contribute to the objective "restore and maintain natural populations of Chinook salmon in the USR," or how the program is being implemented to "minimize the impact of the hatchery program on the natural Chinook populations in the USR."*

**IDFG Response to Comment #2-**Additional detail was added to the report to clarify "management objectives" for the hatchery and natural populations. The statewide management objective is to maintain and restore natural Chinook salmon populations in Idaho. The management objective of the Sawtooth Fish Hatchery is to meet established mitigation goals and to maintain both recreational and tribal fisheries in the USR while minimizing impacts to the natural population. IDFG is confident that best management practices have been and will continue to be implemented in this program. In response to declines in natural-origin abundance the supplementation evaluation was implemented in 1991 to evaluate the use of hatchery strategies to rebuild natural populations. Other management decisions are made to reduce or minimize the potential impacts of hatchery fish on the natural populations, i.e. to maintain the natural population.

***ISRP comment #3 from the Management and Monitoring/Evaluation Objectives section in the introduction-****The sentences on monitoring and evaluation do not identify the individual metrics that are being used to evaluate the various program objectives. Some are self-evident (e.g., adult abundance, harvest) but other objectives are not (e.g., restore and maintain natural populations and minimize impacts). It would be helpful to identify how the information is being gathered. For example, are estimates of adult abundance determined from CWT data collected at LGD or the hatchery rack? Is there representative PIT tagging and CWT tagging?*

**IDFG Response to Comment #3-** As mentioned earlier, the intent of this report was to describe the history and performance of the hatchery program funded through the LSRCP program. While the statewide management objectives include maintaining and restoring the natural populations, the hatchery program has been managed primarily to achieve harvest mitigation objectives. An ongoing supplementation evaluation study that is funded through the BPA Fish and Wildlife program is evaluating the use of a supplementation strategy to increase the number of naturally produced adults (Bowles and Leitzinger, 1991). While we did not provide results from the ISS evaluation, we did provide some data (adult abundance, and life history characteristics) for the natural population in the USR to

show the synchrony in the variability observed for the hatchery and natural populations with respect to survival and life history characteristics.

With regards to how information is being gathered, a key metric provided in this review that allows the monitoring of production and productivity is the estimate of annual adults abundance by age (prior to human exploitation). For the hatchery population, estimates are derived by summing up returns to the hatchery trap, escapement estimates (above and below the weir), and terminal and mixed stock harvest estimates. Determination of age is based on the recovery of CWTs in the escapement and in fisheries. For the natural population, annual adult abundance estimates by age are derived from summing up escapement estimates from spawning ground surveys and redd counts and the collection of biological data from carcasses.

***ISRP comment #4 from the Broodstock History section in the introduction-*** *This section notes that broodstock collected in 1981 (and 1982) likely included adults from Rapid River smolts released into the upper Salmon River in 1979. It appears to be appropriate and necessary to provide an expanded explanation of Chinook salmon smolt releases in the upper Salmon River in the years preceding the development of this program.*

**IDFG Response to Comment #4-** Additional detail was added to the Broodstock History section to address this comment.

***ISRP comment #5 from the Status of the Natural Population section in the introduction-****Additional specific details would enhance this section. The section states that the USR mainstem is part of a USR major population group that has nine independent populations. The sponsors should identify the ESU, the names and number of MPGs in the ESU, and then name USR MPG independent populations, and provide a map with their geographic distributions. There should be a description of where the USR hatchery program interacts with other spring Chinook populations, and the nature of the interaction. For example, genetic interactions may occur in tributaries where hatchery fish stray. It would be helpful to include a figure showing the trends in abundance of natural stocks and the viability assessment/recovery plan thresholds for viability.*

**IDFG Response to Comment #5-** We agree that such detail is informative. This document describes the history and performance of the hatchery program. The natural program status information and potential impacts of the hatchery program on natural populations are described in NOAA-Fisheries Draft Recovery Plan (<http://www.idahosalmonrecovery.net>), NOAA Status Reviews (<http://www.nwr.noaa.gov/ESA-Salmon-Listings/5-yr-review.cfm>) and the USR Hatchery and Genetic Management Plan (<http://www.fws.gov/lsnakecomplan/Reports/HGMPreports.htm>).

***ISRP comment #6 from the Data Section-****Methods were not described, but key metrics were presented. Greater detail, or references to key documents where the methods are adequately described, would be of benefit to the report.*

**IDFG Response to Comment #6-** Detailed descriptions of the methods used to estimate the metrics presented are described in the IDFG annual Monitoring and Evaluation Reports and are available from IDFG.

***ISRP comment #7 from the Data Section-****An explanation of how adults at LGD are partitioned into the different Snake/Salmon river MPGs and independent populations; whether they are these based on CWT or PIT tag data, and the precision of the estimates would improve the report. How robust are the estimates?*

**IDFG Response to Comment #7-** The estimated returns to Lower Granite dam that we provided were developed by summing the hatchery returns, escapement data and the harvest information. Information to directly estimate escapement by stock at Lower Granite dam was not available for the time series presented in this report.

***ISRP comment #8 from the Key Findings Section-****Like many of the LSRCP hatcheries, the USR hatchery has made admirable progress over its 26-year history toward solving in-hatchery production problems and achieving within-hatchery survival, and occasionally, production goals, depending upon broodstock availability. The mixed pedigree of the broodstock and the shifting nature of the supplementation strategy (from segregated to integrated stepping-stone over the last few years) create uncertainty about what we can expect to learn from the USR hatchery program, as well as uncertainty about its future performance. A constantly shifting program becomes difficult to track and assess due to shifting goals and shifting data baselines.*

**IDFG Response to Comment #8-** We believe that there was some confusion about the history of the broodstock and the broodstock management of this program that was likely due to an insufficient amount of information we provided in the Broodstock History section of the initial report. We have since added detail to this section that better describes the broodstock and management strategy. This is also addressed in our response to the ISRP Comment #1 above.

To reiterate, the management strategy from the onset of this program has been focused on mitigating for lost harvest opportunity. During the brood years 1991-2002, a statewide supplementation experimental design was conducted to evaluate the utility of using a supplementation strategy to increase the number of naturally produced adults. A portion of the production capacity for the Sawtooth Fish hatchery program was dedicated for this effort. During this period, integrated broodstock was differentially marked from the segregated mitigation production. This marking strategy allowed for the evaluation of both broodstock components.

***ISRP comment #9 from the Key Findings Section-****It would be helpful if the data reporting were summarized as explicit statements reflecting the managers' self-evaluation of how well the program is achieving the objectives established in the background.*

**IDFG Response to Comment #9-** Narrative was added to the Summary section to address this comment.

***ISRP comment #10 from the Key Findings Section-Smolt Survivals.*** *Why is release to LGD survival higher here for natural versus hatchery smolts, a pattern that is opposite that for the South Fork?*

**Adult timing.** The high degree of synchrony of hatchery and natural Chinook return timing suggests that time cannot be used to reduce bycatch of natural Chinook. Harvests of hatchery Chinook were presented (Note: two Figure 10s were shown). How many natural Chinook were harvested?

**Straying.** Are the presented values the percentage of hatchery fish on the spawning grounds or fraction of hatchery return that were found in streams? If the former, it would be good to present information on the locations sampled and level of effort. If the latter, it is surprising that only 0.59% of the spawners were hatchery origin given that hatchery fish tend to stray, harvest rates are low, and natural fish abundance is very low.

#### **IDFG Response to Comment #10-**

**Smolt Survival-** We have observed higher rates of survival from release to Lower Granite Dam for releases from other hatcheries relative to natural-origin smolts in the same area even though SARs for hatchery releases are consistently lower than those for natural-origin smolts. There appears to be some advantage gained in the hatchery environment that favors early survival subsequent to release and is likely associated with hatchery fish over wintering in a relatively benign environment and the additional energy reserves gained from artificial feeding prior to release. Because SARs of natural fish are consistently higher, this advantage at some point is lost. Why we see increased early survival (release to Lower Granite) relative to natural smolts in one hatchery group and not another could be the focus of future evaluations and investigations. At this point in time, one hypothesis might be that there is a time/distance component to post-release survival of hatchery smolts. The upper Salmon River smolts, because of their longer migration distance, may have experienced this effect before arriving at LGD whereas the SFSR fish may not be subject to the effects until after passing LGD.

**Adult Timing-** this issue is not isolated to the USR. Run timing of all our hatchery stocks show a high degree on synchrony with natural returns. All recreational fisheries in Idaho are mark selective so there is no bycatch with the exception of catch and release mortality. All Chinook salmon fisheries are managed not to exceed take limitations established through consultation with NOAA Fisheries.

**Straying-** The stray rates we report represent the fraction of the entire return that strayed from the USR. As noted in the report, this is considered a minimum estimate because there are places that fish could stray where they would not be recovered. However, for the USR hatchery program, representative tagging with CWTs has been used from the inception of the program and intensive spawning ground surveys are conducted in the USR drainage, throughout Idaho, and the Snake River basin. If straying of USR hatchery fish was significant, CWT recoveries would likely reveal this. Through the implementation of a PBT marking program currently underway, any stray recovered from this program would be identifiable (i.e. PBT would result in a 100% tagging rate).

***ISRP comment #11 from the Outlook and Recommendations section-***The TRT concluded that the natural population was not viable. The “Summary and Outlook for the Future” section of the written

report describes in broad brush the future direction of the program including the implementation of Parental Based Tagging (PBT), which, along with CWTs, will be used to monitor catch contribution and stock identification. This section should also include a brief summary of the findings from the USFWS hatchery review and the HSRG review, and how the program is addressing those findings. The project sponsors also indicate that development of an HGMP is underway. It is our recommendation that the USR HGMP be reviewed by the ISRP or an equivalent body when it is available.

**IDFG Response to Comment #11-** The major programmatic recommendation from the HSRG was the implementation of the integrated broodstock which is also consistent with the approach recommended by the USFWS Hatchery Review Team (HRT). Responses to all of the HSRG and HRT comments and suggestions are in the draft HGMP. The draft is available on the LSRCP website:  
<http://www.fws.gov/snakecomplan/Reports/HGMPreports.htm>

***ISRP comment #12 from the Outlook and Recommendations section*** The Summary section also describes the integrated stepping-stone approach to supplementation that includes maintaining two broodstocks (integrated and segregated). Returns from the integrated brood will be used to supplement the natural-origin population above the hatchery weir and produce the next generation of integrated broodstock. Weir and broodstock management will be based on a sliding scale approach. There is text indicating that this program will initiate supplementation above the existing weir. The management and monitoring of that program should be summarized.

**IDFG Response to Comment #12-** The management and monitoring for this program is described in the draft HGMP mentioned above.