The Lower Snake River Compensation Plan (LSRCP) thanks the Northwest Power and Conservation Council (NPCC) for their interest in the LSRCP Program, and the Independent Science Review Panel (ISRP) for their recently completed Program Review and Report of the Lower Snake River Compensation Plan's Spring Chinook Program (ISRP Report). We support the ISRP conclusion that the symposium format used to facilitate LSRCP cooperator review and independent retrospective evaluation of LSRCP accomplishments worked well and we remain committed to implement this process for the steelhead and fall Chinook program components.

We interpret ISRP's statement that "Overall, the performance and practices within the hatchery were acceptable and met stated goals" to mean the LSRCP program fulfills the Congressional mandate that projects must be based on sound scientific principles, benefit wildlife, have clearly defined objectives and outcomes, and have adequate provisions for monitoring and evaluation of results. LSRPC believes the LSRCP program provides benefits to treaty and non-treaty fisheries, benefits to Snake Basin spring Chinook salmon populations, has clearly defined objectives, and is adequately monitoring and evaluating the results. We feel the symposium and associated reports helped identify areas which can be improved. We are committed to modifying the program in ways that move us closer to achieving LSRCP goals while enhancing or incurring only minimum impacts to ESA listed fish.

Comments in the ISRP Report have been incorporated into the final reports for the LSRCP 2010 Spring Chinook Program Review where appropriate. Comments in the ISRP Report have been and will continue to be useful as LSRCP develops the Steelhead Program Review for scheduled for March 19 and 20, 2012. LSRCP has incorporated ISRP comments on individual programs into the final reports for those individual programs, and the ISRP Report and this response are included with the final Spring Chinook Program Proceedings on the LSRCP website at http://www.fws.gov/lsnakecomplan/Reports/HGMPreports.htm.

Since the November 2010 LSRCP Spring/Summer Chinook Program Review, Draft Hatchery Genetic Management Plans have been produced by program Cooperators and submitted to NOAA, and are available on the LSRCP website. It is unfortunate that these documents were not available at the time of the Program Review because they address in detail many of the comments and recommendations made in the ISRP report. Information in HGMPs addresses many of the ISRP comments and recommendations on original program goals and subsequent cooperator management goals, program change over time, broodstock goals, harvest goals and harvest levels, parent-progeny ratios, and response to hatchery reform (HSRG and USFWS Hatchery Review) recommendations, and will not be specifically addressed.

While planning and organizing the review, LSRCP and Cooperators spent a significant amount of time standardizing format presentations for the individual programs for both oral presentations and written reports. As ISRP observed at the review overall program objectives were established initially in the COE Special Report. Subsequent to the establishment of program objectives, each cooperator incorporated additional objectives into individual programs. As a result, each program is quite different. The roll-up was our initial effort at standardizing reporting of metrics. We felt that the roll-up was effective, however, understand that it can be improved. We have begun the process of incorporating ISRP suggestions and a modified Table 1 (from the ISRP Report) into the planning of the Steelhead Program Review Process. We plan to have a fully filled out Table 1, specific to the steelhead program, available at the beginning of the Steelhead Program Review. We are hopeful that will lead to improved standardization of metric reporting and a more useful roll-up.

ISRP commented that LSRCP primary mitigation goals established in the COE Special Report were based on overly optimistic survival assumptions. In the COE Special Report mitigation goals were based on an

assumed 0.87% survival from smolt release back to the project area as adult, and that for each adult returning to the project area, four would be harvested in fisheries downstream of the project area. This equates to a smolt-to-adult survival of 4.35%. This smolt-to-adult survival is within the 2-6% survival range established by the NPCC as being necessary to restore fish populations affected by development of the hydrosystem. If the COE 0.87% survival to the project area is optimistic, then so is the NPCC goal. The reality of existing conditions does not invalidate the original program goals or mitigation obligation.

In their report, ISRP spent significant time on issues related to impacts of hatchery produced fish on naturally produced fish populations. LSRCP recognizes that this is an important issue. Since the beginning of the program, the LSRCP has focused on accounting for adults produced by the program. Much (but not all) of the work evaluating the impacts of hatchery releases on natural populations has been direct funded by BPA through the NPCC's Fish and Wildlife Program. Perhaps this was not made as clear as it could have been at the LSRCP Program review. For example, Idaho Supplementation Studies (ISS) funded through the Fish and Wildlife Program has been evaluating supplementation effects since the early 1990's. Many of the programs being evaluated by ISS use LSRCP produced fish. ISS did not report at the LSRCP Program Review. On the other hand, the Relative Reproductive Success study reported on by NOAA at the LSRCP review is not funded by LSRCP. The 'spider web' of interconnected studies evaluating effects of LSRCP produced fish and multiple funding sources caused difficulty in deciding what to include and what to exclude in the LSRCP review. The common thread between the presentations was juveniles produced and adults returned.

ISRP recommended that the BACI (Before/After/Control Impact) analysis be used to evaluate supplementation effects. LSRCP agrees that the BACI approach is useful. Where appropriate, we will incorporate BACI analysis into LSRCP evaluation. Conducting BACI analysis will require additional coordination with the NPCC Fish and Wildlife Program, BPA, and perhaps others who fund the evaluation of impacts of LSRCP produced fish on naturally produced fish.

ISRP commented that fresh water carrying capacity needed to be evaluated periodically to minimize effects of density dependence. Addressing carrying capacity issues has both ESA and US v. OR fish management implications and will require participation by NOAA, US v. OR parties, BPA, and NPCC. The impact of hatchery releases on listed natural populations is addressed as part of the development of Hatchery Genetic Management Plans and the ESA Hatchery permitting process.

ISRP recommended that LSRCP and managers take action to rapidly establish natural populations that are viable. Much work is being done to supplement natural populations. However, as ISRP notes in several locations in their report, efforts to increase naturally spawning population size must not lead to decreased productivity of those populations. Work will continue to accomplish this, but how to do that is currently not clear.

LSRCP was disappointed at the lack of emphasis of harvest and harvest opportunity provided by the LSRCP program in the ISRP Report. The LSRCP was developed to replace fish lost as a result of the hydrosystem. Over 80% of the adults that were to be provided were specifically for harvest. At the time of the previous LSRCP review ocean conditions were so poor program emphasis had shifted to increase abundance of ESA listed populations to prevent local extinctions, and little harvest opportunity was being provided. Since then ocean productivity has improved, adult returns (particularly hatchery origin adults) have increased and reasonably consistent annual sport and tribal harvest opportunity is being provided. We believe that the LSRCP Program has taken significant steps toward achieving LSRCP Program goals. While adult return goals remain far from being met, in-hatchery survival goals are being

met currently, broodstock and smolt production goals are close to being met in recent years, and harvest opportunity, particularly above the project area, has increased in the last 10 years. LSRCP acknowledges that, natural populations are not currently viable.

ISRP Findings, Conclusions, and Recommendations

1. Review and approach and LSRCP Report Comments (pp.10-11)

LSRCP plans a similar format for the upcoming Steelhead and Fall Chinook Program Reviews. Planning is underway and efforts are being made to strengthen weaknesses and fill gaps noted by ISRP from the Spring Chinook Program Review. One of the obvious improvements will be preparation of a table similar to Table 1 from the Spring Chinook Review. We intend to use that table to guide preparation of the roll-up/summary presentation. Preparation of a peer reviewed article is under discussion with no decision at this point.

2. How are the project fish performing in the hatchery? (pp. 11-12)

ISRP notes that smolt release goals have never met the original LSRCP objectives. There are three reasons for that. First, few facilities currently have a release size goal of 15 fish per pound. Desire to increase SAR, precosity, mimicking the size of natural fish, and water temperature of hatchery water are all factors influencing hatchery manager decisions to adopt size of release goals different from 15 smolts per pound. Second, real world limitations at some hatcheries prevented achieving smolt production goals. For example, raceway ice cover over winter at Sawtooth Fish hatchery reduces rearing area and mandated a reduction in the hatchery production goal from 2.3 million to 1.3 million (subsequently increased to 1.7 million); inadequate water supply at Clearwater Fish Hatchery prevents operating the hatchery at full production. Clearwater Hatchery increased Chinook production at the expense of steelhead production, which meant leaving steelhead raceways dry because adequate water has never been available to operate the hatchery at full production. Third, broodstock availability has limited production at some facilities some years. For example, Sawtooth Fish Hatchery often struggles to return enough adults to achieve full production; ODFW management objective changes at Lookingglass Hatchery from Rapid River and Carson stock to endemic stock for releases in Lostine, Upper Grande Ronde, and Catherine Creek required rebuilding broodstock sources. While original goals have not been met, LSRCP believes significant progress has been made toward providing adequate brood at each facility to achieve egg and smolt production goals. Changes noted above suggest the need for additional metrics to monitor individual hatchery production goals.

ISRP noted the lack of a summary of differences between hatcheries and years. LSRCP became aware of this shortcoming while putting the roll-up presentation together. We found that the complexity of the program and changes to the program during the last 12 years makes difficult making meaningful comparisons across hatcheries. LSRCP efforts will continue to develop meaningful metrics to compare hatcheries over time.

3. How well are project fish performing once released? (pp. 12-13)

ISRP suggested that better understanding of smolt survival to Lower Granite Dam could lead to increased adult return. LSRCP notes that the number of PIT tagged fish has increased significantly in recent years. LSRCP cooperators currently Pit tag ~140,000 annually to better understand smolt survival

to Lower Granite Dam and to the adult stage. Significant effort is on-going elsewhere in the NPCC Fish and Wildlife Program to install additional Pit Tag detection arrays and to analyze smolt survival (e.g., CSS study) in the Snake River (and Tucannon River) basin to better understand Chinook life cycle survival.

4. What are demographic, ecological, and genetic impacts of programs on wild fish?

ISRP noted that there is "an absence of empirical evidence from the ongoing projects to assign a conservation objective other than preventing extinction". As noted above in 1998, following the last LSRCP Program, ocean productivity had crashed and preventing extinction of local stocks was high priority. Captive broodstock programs were implemented in cooperation with NPCC to increase the number of returning adults to prevent local extinctions. Subsequently, ocean productivity has improved and the number returning adults has increased. HGMPs address management of hatchery origin adults in hatchery and natural production.

5. How are programs being modified and problems achieving objectives being addressed?

Responses to specific hatchery reform (HSRG and USFWS Hatchery Reform) recommendations are contained in HGMPs referenced above.

ISRP suggested additional emphasis be put on evaluating smolt survival from release to the ocean. As noted above, significant effort to evaluate smolt survival within the Columbia Basin is currently occurring. In addition to studies mentioned above, studies the effect of pinnepeds, terns, introduced and native fish on smolts occur. Study on tributary and estuary rearing conditions also occur. LSRCP will coordinate with BPA and NPCC on additional study in these areas as gaps in current information are identified.

Conclusions and Recommendations

1. Develop realistic harvest mitigation levels that might be attainable at some time in the future.

The smolt survival-to-adult goals (4.35%) that underlies the LSRCP Program is consistent with the NPCC goal of 2-6%. If this goal is unrealistic, the entire Columbia River basin adult return goal should be reevaluated also. The reality of existing conditions does not invalidate the original program goals or mitigation obligation.

2. Take action necessary to rapidly establish natural populations that are viable.

Following the previous Program Review in 1998, actions were taken to prevent extinction. Those efforts were generally successful, and extinction was avoided. Now, efforts need to turn to natural population recovery. NOAA is currently in the process of developing hatchery production permits that incorporate attempts to rebuild natural production based on recently submitted HGMPs. Those permits will incorporate natural population protection and rebuilding efforts as approved for the LSRCP Program.