



Independent Scientific Review Panel

for the Northwest Power & Conservation Council
851 SW 6th Avenue, Suite 1100
Portland, Oregon 97204
www.nwccouncil.org/fw/isrp

Memorandum (ISRP 2012-10)

July 19, 2012

To: Joan Dukes, Chair, Northwest Power and Conservation Council

From: Rich Alldredge, ISRP Chair

Subject: Review of a revised proposal and response for the *Yankee Fork Salmon River Restoration Accord* project (#2002-059-00), Pond Series 3

Background

At the Northwest Power and Conservation Council's June 18, 2012 request, the ISRP reviewed the Shoshone-Bannock Tribes' [response](#) to the ISRP qualifications for the *Yankee Fork Salmon River Restoration Accord project (2002-059-00)*. The qualifications were raised in the ISRP's latest review in which it was found that the proposal met scientific review criteria (qualified) (March 12, 2012, [ISRP 2012-5](#), also see [ISRP 2008-11](#)). The response includes a Taurus proposal titled [Yankee Fork PS3 Side Channel](#), which is the subject of this review.

The Yankee Fork of the Salmon River, located in central Idaho in the Salmon-Challis National Forest east of Stanley, is one of the larger watersheds (190 sq mi) within the Upper Salmon River Basin. The project proposal describes that the primary goal for the Pond Series 3 (PS3) Side Channel Project is to create and maintain high-flow refuge and year-round rearing habitat for juvenile Snake River Chinook salmon. The project is also intended to improve habitat for adult Chinook salmon, Snake River steelhead, bull trout, and westslope cutthroat trout.

Recommendation

Meets Scientific Review Criteria (Qualified)

The proposal for the Pond Series 3, habitat-specific actions appears adequate for construction to begin during the summer of 2012. The Qualification refers to several programmatic proposal elements that require future attention and discussion. As noted by the proponents, "The Tribes are in the process of preparing a programmatic proposal explaining their multi-year implementation plan. The programmatic proposal will further address the baseline status of the focal species, habitat, limiting factors, improvements in life-stage survival, and monitoring and

evaluation plans.” The ISRP looks forward to reviewing that document. Elements that the ISRP currently concludes need further development include biological objectives for focal species in terms of Viable Salmonid Population (VSP) parameters, physical habitat objectives developed in reach scale assessments consistent with the Tributary Analysis, and monitoring and evaluation sufficient to evaluate fluvial geomorphic conditions following habitat construction and fish population response.

Comments

General

The Shoshone-Bannock Tribes’ Yankee Fork response adequately addresses the ISRP qualifications, and the revised plan to modify habitat in Pond Series 3 is supportable at this time. The response was thorough with regard to critical, immediate technical issues and addressed the ISRP design concerns. Reviewers concur with proponents that this proposal is a logical action to continue remediation of a legacy of dredging in this drainage.

The ISRP recommends independent science review of multi-year, whole watershed restoration strategies for the Yankee Fork and for Panther Creek as well. These would be based on Tributary Analyses that include all sub-drainages and provide a more comprehensive synthesis of information. This process would allow a more comprehensive look at upslope areas and processes and potential needs/opportunities for restoration as well as possible changes in land/resource management that could provide long-term support for the ambitious, planned restoration effort. Development of restoration strategies for all drainages would hopefully include exploration of alternative treatment mixes and locations for future restoration actions.

Reviewers note that the projected benefits of the revised project are small in terms of annual use with an estimated increase of 500 Chinook salmon juveniles annually. A cost-benefit analysis of the project might be useful. Reviewers realize the difficulty of conducting such an analysis and also appreciate the inherent value of applying lessons learned from this project to future projects.

An enormous amount of work has gone into the planning of Yankee Fork habitat restoration efforts. The Shoshone-Bannock Tribes should be commended for engaging a broad base of partners, both private and government, in this effort.

Comments on the Responses to ISRP Qualifications

1. Develop a formal Fish and Wildlife Program proposal for the pond reconstruction actions.

In the Taurus form, the sponsors state:

“The current proposal is for one habitat improvement activity, the PS3 Side Channel, located in the current Pond Series 3. The Tribes request a funding recommendation from the Council to implement the PS3 Side Channel during the 2012 construction season. Future habitat improvement activities are being developed into a programmatic multi-year implementation plan. At a future date, a separate programmatic proposal with supporting documentation will be prepared and submitted to the Council for ISRP review.”

The proponents chose to submit a proposal for a side channel, and the supporting documents (Gregory and Wood 2012b) provide a good perspective on how it will relate to the overall restoration program on the Yankee Fork. As the Gregory and Wood (2012b) note, however, after 25 years of studies on this system, limiting factors are still not fully understood.

2. Pursue the reach-scale analysis and design work needed to develop justified actions. Do not implement the pond reconstruction elements until the necessary assessment is complete.

The response clarifies that the Tributary Analyses concludes that Yankee Fork reach 2 does not need additional reach level assessment before planning the pond reconstruction project. The proposal is now for a constructed side channel, and a reasonably good rationale is provided for the change in the Gregory and Wood (2012a) report. The environmental baseline and site specific analysis, supporting the design of the PS3 Side Channel, are provided in the PS3 Side Channel Basis of Design Report (CH2MHill 2012), which contains most of the bioengineering details for side channel construction.

Summaries, as completed by Gregory and Wood, of fish populations in the reach were provided. Although the summaries provide little critical new information, they give a better idea of juvenile Chinook and steelhead density and abundance over recent years. The summaries indicate a very low density (an average of about 5 per 100 m²) of juvenile Chinook in the mainstem Yankee Fork between Polecamp Creek and the mouth of the West Fork. This lends support to the current proposal to reconstruct Pond Series 3 to provide more suitable rearing habitat. Both natural- and hatchery-origin fish would be expected to use that habitat.

3. Make necessary modifications in design specifications for pond series habitat alterations so that they function primarily during base flow conditions in summer and during winter. Reconstruction of pond margins to hold juvenile Chinook salmon during high flow conditions in June is not biologically justified and should not be part of the proposed work.

Based on ISRP feedback, the Tribes have redesigned the habitat in PS3 for use by Chinook in periods of low, as well as high flow. This new design greatly increases the benefit of the proposed restoration work. As stated in the initial review, the ISRP believes the redesigned side

channel can, and should, provide winter habitat for juvenile salmonids and this aspect of the project should be incorporated and monitored. The quantities of Yankee Fork stream flow diverted into the PS3 channel, laid out in the PS3 Side Channel Basis of Design Report, for high and low flow periods seem reasonable.

The Basis of Design Report is still not very transparent with regard to selection of habitat criteria for juvenile Chinook salmon (velocity, depth, temperature, cover, etc) and hydraulic modeling. A reasonable likelihood that these desired conditions can be achieved has not been established. Such analyses may be in the appendices but were not included in the Basis of Design Report available through the proposal documents in TAURUS.

Other Comments (considerations for the programmatic document)

Objectives and risk assessment

Along with identification of major uncertainties, monitoring of the project needs to include fluvial parameters to establish that the project is functioning as designed. This appears to have been omitted from the project. While the project is designed to be self-sustaining, it has several engineered elements, including water level control structures that will require future maintenance. This makes the project more involved than returning the riverscape to a more, self-sustaining, normative state.

The project remains vague regarding physical habitat and biological objectives. Specific quantitative attributes that can be evaluated are needed. Objectives for fish populations should reflect VSP parameters.

One of the questions the ISRP posed in their initial review that lead to the Tributary Analyses was:

What are the benefits and risks associated with proposed actions to fish and wildlife populations/resources?

Uncertainty about risks of project failure or making the environmental baseline conditions worse have not been addressed in the proposal or Basis of Design Report. They should be included in the programmatic document.

Mercury and selenium

In the March 20, 2012 review of the project, the ISRP suggested addressing mercury and selenium issues associated with historical mining and related tailings. If any elements cannot be established at this stage because of inadequate information, the necessary information should be gathered, analyzed, and incorporated into the next project proposal.

In the latest proposal, Objective 3 (page 9) notes the intent to maintain water quality without detectable increases in mercury and selenium by reducing conditions conducive to methylation of mercury such as low dissolved oxygen, high organic carbon, and fine sediments, thereby reducing bioconcentration and biomagnification. These points all seem logical.

In addition, the ISRP suggests that monitoring for contaminants (especially mercury) in stream invertebrates be considered to obtain baseline data before construction to compare with data following construction. The construction activities will likely result in considerably more mercury becoming available for an unknown period of time. The concentrations in invertebrates could then be used to project any risks to juvenile fish in the system. This type of data collected over time also could be very useful for evaluating future similar projects.

Monitoring and Evaluation

A Yankee Fork monitoring plan that encompasses this habitat project, the Fish and Wildlife Program supplementation project, and Crystal Springs Hatchery seems reasonable to the ISRP. However, the proposal included performance standards and metrics that the ISRP identified as deficient in the last review, and the proponents made no comments about recognizing those ISRP concerns. Specific concerns were the increased use of reconstructed habitat versus reference locations and increased survival to Lower Granite Dam by fish from the pond site. The earlier comment from the ISRP was that the pond site needed to increase the total abundance of juvenile salmonids in Yankee Fork. Measuring the difference between the constructed site and a reference was interesting, but not sufficient as the difference might only be due to movement of fish from one location to another rather than an overall increase in juvenile abundance. Similarly, survival needs to improve for the aggregate population.

A two-tiered approach to effectiveness monitoring and evaluation is proposed. The proposal describes the approach as follows, "...includes monitoring fish habitat and population changes resulting from habitat improvement activities throughout the Yankee Fork watershed. To assess the effectiveness of habitat changes, biophysical baseline information will be collected and used to assess whether juvenile Chinook abundance increases relative to control areas after activity completion. Baseline information will be collected at the site scale for individual activities. Snorkeling will be conducted above, within, and below activity areas, as well as at control locations within the same strata."

Information on location of control sites is lacking. A comparison between the control and project areas that are monitored before and after modification is recommended. Given the huge natural variation likely to be present when trying to estimate parameters (e.g., density), detecting meaningful differences may not be successful if sample sizes are too small. Proponents might consider alternatives such as a simpler monitoring system where coarse

measurements are taken on a larger scale, for example, abundance classified as low, medium, and high (Marliave and Challenger 2009).

The proposal states, "To assess the effects on fish population, passive integrated transponder (PIT) tag interrogation systems will be installed to track movement in and out of project areas. Fish residence time can be determined from this monitoring, which will allow for determining whether survival is increased due to habitat rehabilitation actions."

This protocol will need control areas that will also be monitored, but these areas were not described in the documents provided. An important consideration is whether enough fish can be PIT tagged to provide useful information.

The proposal describes a PIT tag detection network as follows, "Tagging will also provide a means to tie fish movement into a larger PIT tag interrogation network that is being established at the subbasin scale on the mainstem Salmon River to help determine survival for fish on their route to Lower Granite Dam. At locations downstream of activity areas, several dual PIT tag arrays will be installed and operated year-round; including locations at the mouth of the Yankee Fork and at several locations on the mainstem Salmon River near Challis, and Salmon, Idaho."

This PIT tag detection network should be a very useful tool to assess survival to Lower Granite relative to (a) fish size when leaving Yankee Fork, (b) timing of that departure, such as early vs. late, and (c) hatchery vs. natural origin. Specific testable hypotheses should be framed and evaluated.

References

- CH2MHill. 2012. Yankee Fork Habitat Improvement Project: PS3 Side Channel. Intermediate (60 Percent) Basis of Design Report. For Bureau of Reclamation, 1150 North Curtis Road, Suite 100, Boise ID 83706-1234. Draft report. April 2012.
- Gregory, J. and C. Wood. 2012a. Evaluation of juvenile anadromous fish populations in Pond Series 2 and 3 and adjacent areas in the Yankee Fork drainage. Final report January 2012. For Bureau of Reclamation, 1150 North Curtis Road, Suite 100, Boise ID 83706-1234
- Gregory, J. and C. Wood. 2012b. Yankee Fork Drainage Fisheries Summary. Draft Report May 2012. For Bureau of Reclamation, 1150 North Curtis Road, Suite 100, Boise ID 83706-1234
- Marliave, J. and W. Challenger. 2009. Monitoring and evaluating rockfish conservation areas in British Columbia. Canadian Journal of Fisheries and Aquatic Sciences 66: 995-1006.