



Independent Scientific Review Panel
for the Northwest Power & Conservation Council
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Memorandum

April 19, 2007

To: Peter Paquet, Acting Fish and Wildlife Division Director, Northwest Power and Conservation Council

From: Eric Loudenslager, ISRP Chair

Subject: Review of Results Report for the *Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project* (1984-021-00)

Background

At the request of the Council, the ISRP reviewed the results report from Oregon Department of Fish and Wildlife for Project 1984-021-00, *Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project*. This is a follow-up review to the ISRP's review (appended below) and Council's recommendation for the FY 2007-09 project selection process. The ISRP recommended "Fundable in part (Qualified)... It is time for a comprehensive review of this project's biological results. One year of funding should provide time for this while continuing ongoing field projects. Future funding should be contingent on completion of a satisfactory document." The Council recommended that the "sponsor should complete [an] accomplishments report as called for in ISRP recommendation. Funding in FY08 and 09 contingent upon favorable review by ISRP and Council." The results report was provided to address the ISRP's comments and the Council's recommendation.

Review Summary and Recommendation

The sponsor made a conscientious effort to address the specific questions posed by the ISRP. However, the ISRP's larger concern from its last review of the project, which was the lack of a comprehensive analysis of project results, is not adequately addressed in the response. The previous ISRP review asked a series of specific questions but made the fundable-in-part recommendation contingent on the sponsor's development of a comprehensive reporting of results obtained through project monitoring. The sponsor produced a response loop type document to address the specific points raised by the ISRP but did not produce a comprehensive summary. It seems clear that project monitoring and analysis of results is minimal at this point in time. Certain elements in the response, however, suggest that the sponsor is amenable to conducting project effectiveness monitoring or coordinating with other Fish and Wildlife projects in the John Day subbasin to accomplish evaluation. For example, the sponsor indicated

that they will be working cooperatively with the John Day River Fish Research Project to develop a BACI design for effectiveness monitoring of the their habitat projects.

The ISRP recommends that a comprehensive summary of the habitat restoration taken by 1984-021-00 since 1984 is still needed. That report should identify:

- the locations where restoration has occurred;
- the location of these sites relative to spawning and rearing areas for the focal species;
- what monitoring data exists for these sites;
- an analysis and interpretation of the data; and
- an outline for monitoring in the future (this is the place to report the BACI design for effectiveness monitoring identified by the sponsors).

Currently, ongoing fencing projects within the John Day basin appear to be treated as independent entities with little consideration of their relative importance or how they interact. These projects, which all have a united goal, need to come together in a coordinated manner with positive use of the resulting synergy. Work on the various adverse habitat problems within the subbasin needs to be based on a holistic understanding of the system, the limiting factors, and how it all works together. We cannot hope to be successful in restoring habitats to the benefit of fish and wildlife by treating one reach at a time, piecemeal, in isolation from the remainder of the subbasin.

Specific Comments

The ISRP comments below are organized in the same manner as the project sponsor's results report. Four specific ISRP Final FY 2007-09 review comments are identified, and each is followed by the ISRP's current review comments on how well the project sponsor addressed those comments.

ISRP Comment #1 *“The 1991 and 2002 citations support continued fencing, but it is noted that sites studied by Kauffman et al. 2004 may not all be John Day sites and impacts on fish summarized from that paper are inconclusive.”*

The sponsor responded adequately to the question. The information provided by the sponsor provides a scientific rationale of why riparian fencing exclosures would be considered a reasonable strategy to improve stream habitat in the John Day River subbasin. Much of the response is a literature review of the relevant topics that is detailed and comprehensive. It is not a summary of what the project has accomplished but it does address the specific question posed by the ISRP. Based on what has been submitted, however, the ISRP could not report to Council on the scale or magnitude of benefits to fish and wildlife from pursuing this strategy.

In response to the ISRP's question, the sponsor shows that most of the sites included in the studies cited in the proposal were in the John Day subbasin. In addition to Kauffman et al. (2002; cited in the proposal), publications cited in the response, many of them peer reviewed (e.g., Bayley and Li, 2006; Keller and Burnham, 1982; Knapp and Matthews, 1996; Saunders and Fausch, 2006), found increased fish abundances and improved habitat conditions in

stream reaches within enclosures, although some of these studies were not conducted in the John Day basin. The studies discussed in the response provide convincing inferential evidence that enclosures in the John Day subbasin can benefit both stream habitat and salmonid fishes. In their response, the sponsor states that, in some cases, the lack of conclusive data is apparently a result of the size of the enclosure areas — the areas need to be larger to show desired results. This latter type of observation serves as the ISRP’s reasoning that just because livestock enclosures could be beneficial does not mean that they are. If they are of inadequate size, or in inappropriate locations, or not in critical locations, they are unlikely to be effective.

ISRP Comment #2 *“Citing preliminary analysis from project #199801600 might suggest that it would be wise to review project plans in terms of these more specific goals.”*

The sponsor cites some preliminary analyses that they maintain could provide indirect evidence for improved habitat conditions for Chinook salmon. The response includes information on the spring Chinook stock in the John Day River, after promising that, “During the next few months the ODFW Habitat Project will work with John Day River Fish Research (JDFR) personnel to develop a Before After Control Influence study (BACI) for short term effectiveness monitoring and further evaluate existing data collected by the Habitat Project.” The response presents data in support of the hypothesis that the Habitat Project will benefit Chinook production. For example, in referring to the relationship between smolt yield and brood year redds (a surrogate measure of escapement) shown in Figure 2 on page 5, they claim, “The curve shows that at about 1,000 redds (or about 3,000 adult salmon), recruitment reaches a plateau, suggesting that existing rearing habitat is limiting production (Figure 2). One way of increasing production is through enhancing fish habitat.” Later, in response to the question about what other changes have taken place resulting from efforts outside the project (page 9), the sponsor states, “There are a multitude of changes within the watershed that could have an effect on the Habitat Project, mostly for the better.” These claims all seem to be reasonable, given that there is very strong evidence from the John Day subbasin and elsewhere in the region that livestock enclosures are an effective means of improving fish habitat. From the general tone of the response, the project sponsor apparently feels that conditions in this subbasin are now more favorable for fish production than they were prior to the onset of the habitat restoration work in 1984. In spite of the circumstantial evidence provided, however, the sponsor’s contention that increases in salmon abundance within the John Day subbasin, at least in part, have been due to improved habitat conditions needs substantially stronger, more direct, empirical support at this point in time.

The sponsor has not yet sorted out all the possible reasons for improved adult returns that they maintain could result from improved habitat. For example, the increased adult returns since 2000 could be related to factors other than (or in addition to) improved habitat such as ocean conditions. The sponsor presents a stock-recruitment curve that they maintain indicates that rearing habitat is limited. The data used to construct the curve is limited and highly variable and, without the 1978 data point, the pattern appears linear not curvilinear. Furthermore, increased smolt abundance could simply be related to increased returns of adults since 2000’s and not necessarily to improved habitat (see comment and ISRP analysis of smolt survival below). Although the trends in adult returns and smolt production appear promising, much more data and data analysis is needed to make a convincing case that these responses directly relate to habitat improvement within the John Day. The sponsor clearly recognizes this need and has expressed

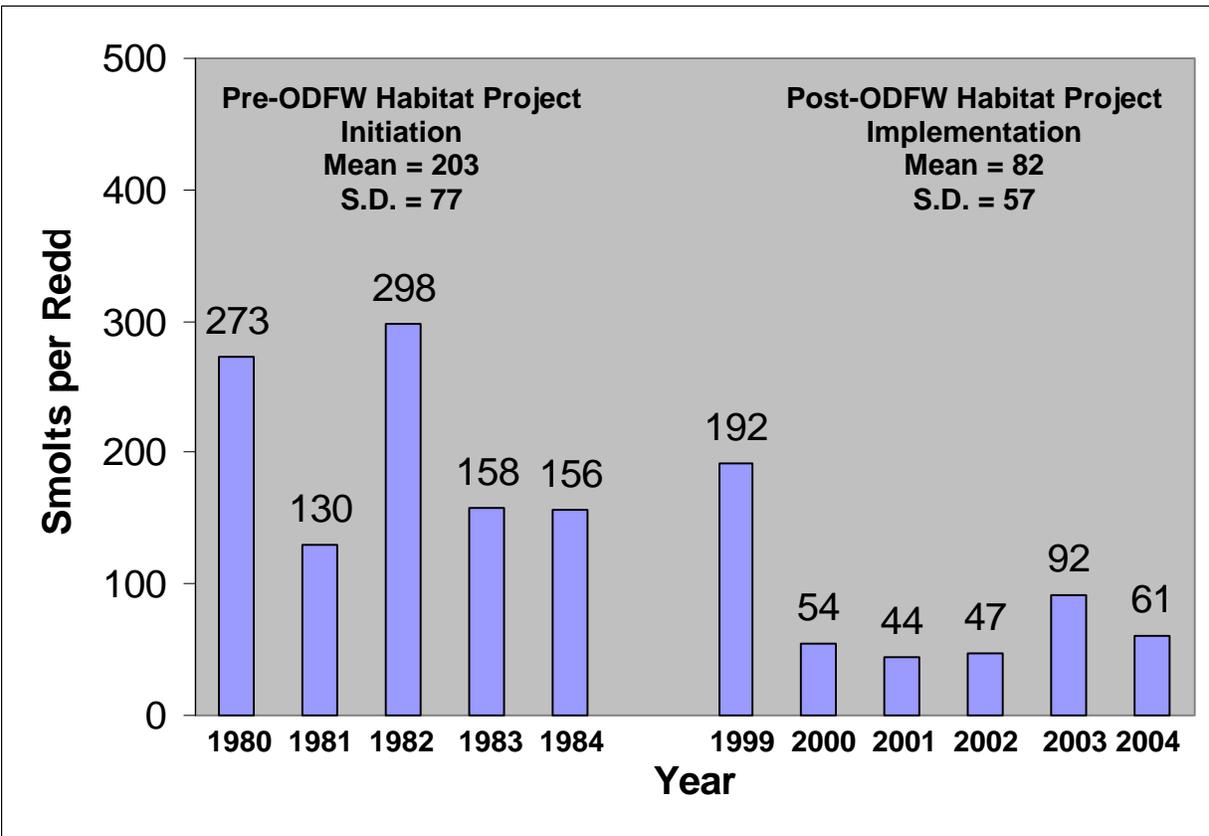
interest in being involved in this work. A promising development is the commitment of this project to work with The John Day River Fish Research Project (#199801600) to develop a BACI design to evaluate short-term effectiveness monitoring of the habitat projects.

The responses to the ISRP questions do not provide a completely clear picture of how future stream fencing sites will be selected, although selection will apparently be strongly influenced by landowner willingness to participate in the program. Without more detail, the ISRP wonders whether the most critical sites for restoration will ever get the attention they deserve, especially if the stream flows through a recalcitrant landowner's property. Furthermore, the response suggests that continued habitat degradation may be occurring in areas that have been treated (fenced). They state "Additional data collected by JDFR indicates there has been a gradual shift in spring Chinook spawner distribution to downstream reaches, which suggests spawning or adult Chinook holding habitat conditions have either improved below areas treated by the Habitat Project or spawning habitat conditions within the treated reaches have degraded." This observation leads to the question: are conditions in the John Day subbasin deteriorating faster than restoration can improve them?

This question makes the spring Chinook information in Table 1 (page 6) especially valuable. If conditions subbasin-wide are improving, there should be an increase in the ratio of smolts to redds as freshwater survival improves; that is, a greater percentage of fish will survive from egg to smolting if habitat is being restored faster than it is being lost. On the other hand, if the trend is for a net loss of productive habitat (more is degraded than is protected or restored), the smolt/redd ratio should decline. Unfortunately, this ratio is not given in Table 1 even though it is highlighted in the table heading.

However, it is possible to estimate the number of redds from the scatter of points in Figure 2, and from these numbers calculate the ratio of spring Chinook smolts (Column 3 in Table 1) to brood-year redds. This is plotted by the ISRP in the graph below. Surprisingly, the average number of Chinook smolts per redd declined by about 60% from the pre-treatment years 1980-1984 to the post-implementation period 1999-2004. This does not necessarily mean that the habitat restoration projects have been unsuccessful. The low numbers of smolts per redd from 2000-2004 may reflect the regional drought conditions that have prevailed during this interval, or some other unknown factor. With 1999 a good water year (best recent smolt year), and 2000-2004 drought years in much of the west (with partial recovery in 2003/2004), it seems like drought was most likely an overriding factor in smolts/redd ratios. The sponsor needs to evaluate the smolts/redd data in terms of river discharge at key times of the year (use USGS gauging station information) and perhaps other parameters. This type of data analyses is needed to understand the influence of habitat improvement on smolt production. The smolts/redd ratio, however, certainly does not demonstrate project effectiveness in this case.

Datasets such as these illustrate the difficulty of drawing conclusions about habitat restoration effectiveness at a large scale without a carefully considered study design involving suitable control sites and appropriate effectiveness metrics. The ISRP strongly encourages the sponsor to develop a spatially explicit study design for determining the effectiveness of fencing projects, including meaningful and measurable habitat and biological response metrics that will facilitate an evaluation of this important habitat improvement program.



ISRP Comment #3 *“Another question is, overall, how much progress has been made toward project implementation goals? For example what percentage of streambank miles needing rehabilitation has been rehabilitated to what extent?”*

The sponsor provides a reasonable response to the ISRP’s question concerning the number of stream miles rehabilitated. Nearly 150 miles of stream has been treated to date,¹ which amounts to only 8-9% of the estimated stream miles inhabited by the focal species within the John Day subbasin. They also present evidence that banks are stabilizing and the channel is narrowing at two project sites within the John Day basin over the last four years. The sponsor, however, did not address progress toward other implementation goals such as those related to bull trout and redband trout.

The sponsor does not state how many miles of stream need rehabilitation. The small percentage of the overall stream miles treated is an interesting insight. The question remains, how many of these miles need “treatment,” and how effective has the 144 treated miles been since the project sites are scattered throughout such a huge basin. How many of the projects are fencing projects? What are the sizes of the projects and on what type of land are the projects sited? Fencing riparian areas in pastures or on field edges where livestock are more easily managed is a different

¹ This is all projects together, not just the one under consideration.

level of practice than fencing streams on rangeland where no other means of livestock control may be feasible. Some of the former types of projects (conducted by the Habitat Project) may be beneficial to some degree, but perhaps may not be of very high priority. Off-stream water development has been very successful at moving cattle out of riparian areas, as has riding and other behavioral approaches, but the project seems to believe that only fencing is appropriate. As the sponsor notes, each site has its own potential, but rather than seeing this as an obstacle to monitoring (as they appear to), it is an opportunity to determine which situations yield the most results for the resources invested. After such a long period of activity, some conclusions must be obvious.

It would be ideal to have a basinwide riparian assessment, such as a Properly Functioning Condition analysis, and a prioritized plan as a basis for coordinated efforts in the basin. Efforts to protect properly functioning reaches may be more critical than efforts to restore non-functional reaches. Identifying reaches at risk proximate to functioning reaches would also contribute to a strategic approach.

ISRP Comment #4 *“What changes have occurred in the watershed outside these projects that contribute to the cumulative effects of this project, both positive and negative?”*

The sponsor discusses both positive and negative factors that could affect the projects. On the positive side, this project clearly is part of a larger effort directed at basinwide habitat restoration. Since inception of the project, the sponsor has been working cooperatively with counties to restore habitat and fish in the John Day subbasin. Their work complements efforts being conducted by Watershed Councils, Soil and Water Conservation Districts, the Confederated Tribes of the Umatilla Indian Reservation, and several other agencies and organizations. All of the coordinated activity in the basin is a plus and would certainly leverage the contributions of an effective habitat project. It is difficult, however, to decipher how many projects have been funded and by whom (e.g., BPA, OWEB), and what group implemented and monitored the projects (ODFW, County, Tribes, etc). A location-specific project inventory with results (perhaps a spreadsheet) would be an invaluable reference.

The sponsor asserts that negative impacts are largely administrative, involving the permitting process. The sponsor expressed some dissatisfaction with the direction of the research being conducted in the basin and maintained that much of the research is not directly relevant to habitat restoration priorities. This issue perhaps indicates insufficient coordination and cooperation between the researchers and project personnel. In addition, existing fish passage barriers and outdated screens on a large number of irrigation diversions could impede salmonid response to improved habitat.

As pointed out earlier in this review, there are several factors that could negatively affect the project that the sponsor could have addressed such as the status of ongoing habitat degradation in the basin and whether they think degradation is occurring more rapidly than restoration. They also could have addressed problems in gaining landowner cooperation. Is land use changing to any degree in the basin such as fragmentation and hobby ranching? What is the irrigation/allocation situation? How might such situations, if present, figure into an overall

strategy? This scale of analysis was the intent of the subbasin planning process, a tool whose use should be reflected in all 2007-09 project proposals.

Appendix. Final ISRP FY 2007-09 Review Comments

198402100 - Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project

Sponsor: Oregon Department of Fish & Wildlife (ODFW)

Province: Columbia Plateau **Subbasin:** John Day

Budgets: FY07: \$486,515 FY08: \$519,262 FY09: \$537,463

Short description: This project was initiated on July 1, 1984, (BPA) contract number DE A179-84 BP17460 and allows for initial landowner contacts, agreement development, project design, budgeting, and implementation for anadromous fish habitat on private lands.

ISRP final recommendation: Fundable in part (Qualified)

Comment (from response loop):

Three previous reviews have emphasized that future funding would be contingent upon providing analysis of project results based on quantitative monitoring of biological outcomes, specifically, habitat characteristics and presence of target species. The sponsor's response included excerpts from both a project-specific review from 1991 and a more general study from 2002, along with some example photopoint comparisons.

The sponsor has obviously conducted a locally popular program with results in re-vegetating of riparian corridors, as evidenced by the photopoint monitoring described in the response. After 22 years, the project should be showing changes in characteristics such as abundance of fishes, bank stability, and stream width-depth relationships. It is doubtful that before/after photopoint comparisons alone would be adequate for assessing some of the parameters listed in the proposal.

The 1991 and 2002 citations support continued fencing, but it is noted that sites studied by Kauffman et al. 2004, may not all be John Day sites and impacts on fish summarized from that paper are inconclusive. Citing preliminary analysis from project #199801600 might suggest that it would be wise to review project plans in terms of these more specific goals. Are current project proposals and priorities in line with these goals? Several project specific measurements are cited but not in the context of the watershed as a whole.

Another question is, overall, how much progress has been made toward project implementation goals? For example, what percentage of streambank miles needing rehabilitation has been rehabilitated to what extent? What changes have occurred in the watershed outside these projects that contribute to the cumulative effects of this project, both positive and negative? Project results must be assessed so that inferences can be drawn about changes observed in the John Day in the context of changes occurring in the larger region. Project 200301700, Integrated Status and Effectiveness Monitoring Program, includes a John Day pilot program that should be helpful in this, but is just getting organized. Close cooperation with the M&E project and sharing of results and experiences from this long-running project will maximize the benefits from both.

It is time for a comprehensive review of this project's biological results. One year of funding should provide time for this while continuing ongoing field projects. Future funding should be contingent on completion of a satisfactory document.

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