



Independent Scientific Review Panel
for the Northwest Power & Conservation Council
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Memorandum (ISRP 2010-16)

May 27, 2010

To: Bruce Measure, Chair, Northwest Power and Conservation Council

From: Eric Loudenslager, ISRP Chair

Subject: Review of CRITFC Accord Proposal, Tribal Pacific Lamprey Restoration Plan Implementation (2008-524-00)

Background

At the Northwest Power and Conservation Council's May 5, 2010 request, the ISRP reviewed a revised proposal for the Columbia River Inter-Tribal Fish Commission's Accord project titled, *Tribal Pacific Lamprey Restoration Plan Implementation* (2008-524-00). We reviewed an initial proposal in June 2009 ([ISRP 2009-24](#)). At that time the proposal was titled, *Pacific Lamprey Passage Design*. The title was changed to more accurately reflect the wide scope of the project, which is to improve adult and juvenile Pacific lamprey passage through mainstem and tributary blockages. It also will provide information and actions to reduce uncertainties with respect to mainstem lamprey distribution and abundance, habitat quality, habitat use, and genetic characteristics. The project is also intended to implement specific objectives of the Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin. The ISAB reviewed a draft of that plan in December 2009 ([ISAB 2009-3](#)).

This proposal is one of four new lamprey projects submitted to implement the Columbia River Fish Accords. Other lamprey proposals include the Warm Springs Tribes' lamprey monitoring project in the Fifteenmile Creek and Hood River Basins (2007-007-00); the Yakama Nation Lamprey Program (2008-470-00); and the Warm Springs Tribes' Willamette Falls Lamprey Escapement Estimate proposal (2008-308-00). The project is also coordinated with other regional lamprey efforts, such as the Corps AFEP program, the USFWS Lamprey Coastwide Initiative, and the CBFWA Lamprey Technical Working Group. CRITFC is attempting to take advantage of timely collaborative relationships with other agencies and groups for both funding and resources.

In the ISRP's June 2009 initial review of the proposal, we recommended *Meets Scientific Review Criteria – In Part*. Our review summary stated:

This is a proposal to implement four objectives of the *Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin*. To accomplish this, ten general sub-objectives are identified in this proposal. One task is to finalize the draft lamprey restoration plan. The ISRP believes strongly this objective should be

given a priority. Development of the overall tribal lamprey recovery program, including a prioritized list of actions and studies, should precede implementation of fieldwork.

The information in the proposal describing the methodology to undertake the remaining sub-objectives (and associated tasks) is too general to serve as a basis for scientific review. These sub-objectives need a response with additional details.

When viewed as a research and restoration plan, or part of a plan, the proposal could serve as a basis for designing meaningful project components. The proponents need to develop each specific objective from the *Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin* with the sub-objectives, addressing each of the major elements. As the proposal now stands, it is simply too general. It lacks specific, detailed methodology and study design to be considered scientifically justifiable. The proponents should give serious consideration to prioritizing (with rationale) the myriad conceivable projects that could fall under the broad “plan” as outlined in the present proposal. It would be helpful if the proponents culled those sub-objectives that would not be funded directly by this project and provided more details on the methods that will be used to address lamprey passage and distribution questions.

On April 29, CRITFC presented some elements of the revised proposal to the ISRP, highlighting the project’s ongoing Willamette River adult lamprey migration and habitat study by Dr. Carl Schreck and Ben Clements of Oregon State University. The ISRP appreciated this presentation.

The ISRP’s review of the revised proposal follows below.

ISRP Recommendation

Meets Scientific Review Criteria (In Part, Qualified) – Objectives 1 and 4 meet criteria (qualified). Parts of Objectives 2, 3, and 5 meet criteria, and other parts need separate sub-proposals. Objective 6 is premature – it should be based on the outcome of Objective 3.

Objective 1. Qualified. There is a dramatic coast-wide lamprey decline than is unexplained. The outreach and coast-wide collaboration components are likely of equal or even greater importance than the freshwater work. The list of key elements is presented without details on the science needed to implement them. Completing the plan should include basic data on the status of lamprey, a summary of what has been completed, what needs to be developed further, the work element deliverables, a road map to execute a restoration plan, and how the work is going to be evaluated.

Objective 2. In Part. Actions and tasks pertaining to coordination and participation in planning and design for research and structural improvements for lamprey passage (Action 2.1, Task 2.1A; Task 2.1B, subtask v; Task 2.1D, subtask ii and iii) meet scientific review criteria. The ISRP requests separate proposals for each of the following: Task 2.1B, subtasks 1-4, Task 2.1C, subtasks 1-4, Task 2.1D, subtask 1.

Objective 3. In Part. The Panel does support work to collaborate and share data with other entities conducting concurrent adult lamprey telemetry research in the Willamette, collaboration

with data bases on lamprey abundance and literature reviews on predation. Action 3.1, Task 3.1A, subtask iii and iv; Task 3.1B, subtask ii and v; Action 3.2; Action 3.4 meet scientific review criteria. The ISRP requests separate proposals for each of the following: Task 3.1A, subtasks 1 and 2, Task 3.1B, subtasks 1-4, Task 3.3A, subtasks 1 and 2, Task 3.3B

Objective 4. Qualified. Protocols for monitoring and evaluating the effectiveness of outreach programs should be specified in contracting. Development of indicators may be a worthwhile approach (see the ISRP report, Input on Evaluation of Regional Coordination Projects, [ISRP 2007-14](#)).

Objective 5. In Part. Actions and tasks to evaluate existing data and literature on lamprey contaminants and environmental parameters –Action 5.1, Task 5.1A, and Action 5.2 – meet scientific review criteria. The ISRP requests a separate proposal for Action 5.1, Task 5.1B.

Objective 6. Does Not Meet Review Criteria. The ISRP concluded that this objective is incomplete and premature and could be a future project element or preferably a separate proposal after completion of Objective 3.

The ISRP's requests for proposals for subcomponents can be handled like the individual projects in the Wenatchee complexity project or the ISEMP project (where individual designs were provided and reviewed for the Lemhi, John Day, and Wenatchee components). In other words, individual designs for the subcomponents of the lamprey program should be sufficient, and BPA contract numbers and full narratives would not be needed for each subcomponent.

ISRP Comments

1. Overall Comments - Benefit to F&W

The proponents have responded to many of the ISRP's recommendations and comments in the previous review and many obvious improvements have been made to the proposal. If implemented, the project will provide worthwhile benefits to Pacific lamprey, especially as there is so little information available on the life history and population status of this species. The proposal and response contain the components for an effective large-scale program to address extremely critical issues. However, as with the original proposal, four of the six objectives (i.e. 1, 4, 5, and 6) lack specific detailed methods for accomplishing the objectives or are premature pending results of planned or ongoing studies (Objective 6). Also Objectives 2 and 3 are really broad goals, and the true objectives are hidden within the Actions, Tasks, and Subtasks. The text for these two "objectives" needs to be reorganized and rewritten (see comments in section F).

The ISRP concluded that the proposal includes more topics than can be reasonably evaluated under one title. More organization, prioritization, and timelines are necessary to see how the subcomponents can fit into a sequence of projects. The Panel strongly suggests that the proponents abandon their effort to structure a single, umbrella proposal covering multiple projects and focus instead on timely completion of a basinwide lamprey restoration plan and submission of detailed, scientifically credible proposals (individual designs) for work needed to implement the plan.

In addition as mentioned in reviews of other lamprey restoration proposals ([ISRP 2009-45](#)) and emphasized by the ISAB ([ISAB 2009-3](#)), a better balance needs to be struck between possible

limiting factors for this species in the ocean and freshwater. The proponents do mention a literature review and possible use of climate models in this regard, but more emphasis is required for the marine component, given the apparent coast-wide decline of lamprey. We recognize that marine work is expensive and complex, but collaborative efforts could be made with NOAA and other marine agencies. Collaboration could also be formed with lamprey biologists working on other river systems along the northeast Pacific coast to investigate common limiting factors.

2. Technical Justification, Program Significance and Consistency, and Project Relationships (sections B-D)

The ISRP notes the title has been altered to better reflect the multiple goals of the proposed project. Additional references have been added/updated, which improve the technical justification for the project. The proposal adequately describes how this project will address a number of goals in several regional programs including the Council's Fish and Wildlife Program, the Accords agreement, the 2004 Lower Columbia River Mainstem Subbasin Plan, and the Columbia River Treaty Tribes' anadromous fish restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (1995). The proposal also does a good job of describing how this project will relate to and coordinate with other projects in the region doing lamprey work.

However, the ISRP found an incomplete logic path from the data that established the current "at risk" status of Pacific lamprey and the broad subjects addressed by this project to the specific approaches that will be used to tackle the status and trends, limiting factors, and uncertainties, that this project is to address. The actual implementation is vague and not well linked to the existing body of knowledge on lamprey. Much of the proposed work is in fact coordination.

3. Objectives, Work Elements, and Methods (section F)

This section of the proposal has been significantly revised and the original four objectives have been completely altered or deleted (except for Objective 4 - education and outreach) and two new objectives have been added (see #s 5 and 6, below).

Revised Project Objectives

Objective 1. Finalize the Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin.

As the ISRP recommended, the proponents have added this as a first objective but their response to our recommendation is incomplete. More detailed information is required on each of the Action items of this objective.

The Panel remains concerned that the proponents have not provided a focused plan as suggested in our last review. What they have provided is a list of key elements that are likely to be in a final plan, presented without details on the science needed to implement them. The final plan is to be released in the latter part of 2010. It would seem that the plan could be completed sooner, perhaps no later than the end of summer. From the information presented in the proposal, it appears that much of the work supporting the plan has already been completed. Our previous review gave suggestions for completion and ISAB (2009- 3) also provided the proponents with a detailed review of the draft plan.

At the minimum the proponents should detail a process for completing a list of prioritized projects and ways and means of pursuing regional buy-in. The proposal for the plan should include basic data on the status of lamprey, a summary of what has been completed, what needs to be developed further, the work element deliverables, a road map to execute a restoration plan, and how the work is going to be evaluated.

However, because of the regional importance and precarious situation of lamprey populations in the Columbia River Basin we concluded that some key elements of the draft plan should proceed, but many of the sub-objectives need separate proposals, as described below.

The Panel appreciated the efforts the proponents have made to show the interrelationships of the various CRITFC lamprey projects in the flow diagrams of the proposal. Developing a restoration plan for a species with a complex life history is a challenge, especially when so little is known about the life history of the animal.

Objective 2. Assess and improve mainstem and tributary lamprey passage efficiency and survival.

The ISRP supports objectives pertaining to coordination and participation in planning and design for research and structural improvements for lamprey passage (Action 2.1, Task 2.1A; Task 2.1B, subtask v; Task 2.1D, subtask ii and iii).

Several tasks propose installation of structures and implementation of methods for passage improvement and enumeration of adult and juvenile migrants following development and testing (e.g., Task 2.1 C, subtask 1). The design and tests of structures and methods should be reviewed by the ISRP before a costly commitment to installation and implementation is approved. In general the objectives would be improved by addition of detailed information, including specific objectives, clear research design, detailed methods, and means for data analysis. Specifically, ISRP requests separate proposals for each of the following:

- Task 2.1B, subtasks 1-4
- Task 2.1C, subtasks 1-4
- Task 2.1D, subtask 1

Objective 3. Monitor and evaluate, collect and disseminate information on lamprey population status, life histories and mainstem habitat.

The ISRP found similar organizational problems as with objective 2. Several disparate specific objectives are diffused within the text: (1) migration behavior, (2) determine habitat preference/use (migrating, holding, spawning) (3) vulnerability to predators, and (4) determine genetic structure, gene flow. The proposal would be improved by focusing on key objectives, and this section should clearly separate “status and trend monitoring” and uncertainties research.

The ISRP does support work to collaborate and share data with other entities conducting concurrent adult lamprey telemetry research in the Willamette, collaboration with data bases on lamprey abundance and literature reviews on predation. We recommend acceptance of Action 3.1, Task 3.1A, subtask iii and iv; Task 3.1B, subtask ii and v; Action 3.2; Action 3.4.

The ISRP requests separate proposals for each of the following:

- Task 3.1A, subtasks 1 and 2
- Task 3.1B, subtasks 1-4
- Task 3.3A, subtasks 1 and 2
- Task 3.3B

The proposal would be improved by clearly distinguishing between “resource selection/preference” by lamprey and resource association. The proponents plan to evaluate correlations between habitats and location and lamprey residency, and from these data interpret habitat selection and preference and perhaps limiting factors. It could be, however, that the sites are not preferred and still limiting, because preferred and adequate sites are not reasonably available for “selection.” Thus, the animal “selects” a suboptimal option because an adequate one is not detectable. There is a growing literature on animal resource selection, and the proponent does not appear to have fully developed methods consistent with contemporary standards. See the special issue of the Journal of Wildlife Management, Volume 70, 2006.

Objective 4. Establish and coordinate public education and other outreach programs.

This worthwhile objective would be improved by giving more details on how the programs would be developed and specifically who would be reached. Protocols for monitoring and evaluating the effectiveness of these programs should be specified.

Objective 5. Evaluate contaminant accumulation and other water quality impacts on lamprey.

This is an important addition to the proposal, and the ISRP supports, in principle, the sampling of lamprey for contaminants in the Willamette River. Unfortunately, the proposal does not provide sufficient information for adequate review (i.e. no sample design, locations, sample sizes, list of contaminants to analyze, etc.). The ISRP is concerned that pharmaceuticals and personal care products are apparently not being considered but without a list it is difficult to say. In addition, analytical methods are not provided. The Panel therefore requests a separate proposal for Action 5.1, Task 5.1B).

The ISRP is in favor of the literature reviews on toxics (Action 5.1, task 1A and Action 5.2) as they affect lamprey as these fish have a very high lipid content that can lead to significant bioaccumulation of legacy contaminants and other recent chemicals such as flame retardants. The Panel recommends Geeraerts and Belpaire (2009) for a discussion of the problem in detail. The preliminary proposal by Schreck to develop methods for culture/rearing of lamprey could lead to controlled laboratory studies to help understand the effects of various toxics (see Objective 6).

One of the attachments (Tissue Investigation) with the current submission is a Quality Assurance Project Plan (QAPP) that is required for toxics studies. It provides details for another CRITFC study funded by EPA on handling samples, analytical techniques with precision and accuracy reported, and the toxics being analyzed. Composites of 5-7 adult lamprey (of a specific size) will be analyzed for various legacy contaminants (which were listed) and various PBDE (flame

retardant) congeners at Willamette Falls (2 composites), John Day Dam (3 composites), and the Deschutes River at Shear's Falls (1 composite).

Details like those above are missing in the current document, and the rationale/logic for the various type of analyses and collections need to be reported. The analyses of juveniles are indicated in the proposed study, but no information is provided on the size to collect or analysis of individuals or composites. Perhaps different size classes (ages) of young should be evaluated at various locations to estimate accumulation rates over time, etc. More details are needed for the proposed study. Pharmaceuticals and personal care products were not mentioned in the QAPP and should be considered.

Objective 6. In collaboration with CRITFC member tribes and other regional entities, plan, develop, and, if appropriate, implement an experimental conservation artificial production facility.

Artificial culture is being used for a number of imperiled species – delta smelt, Rio Grande silvery minnow, Gila topminnow, razorback suckers, and Colorado pikeminnow – so beginning to develop the technology is appropriate. Any artificial culture should focus on restoration/conservation and possibly use for experiments with contaminants, not production for harvest of released individuals (ISAB 2009-3).

The ISRP concluded that this objective is incomplete and premature and could be a future project element or preferably a separate proposal after completion of Objective 3. Only then should planning for a facility (Action 6.1, Task 6.1A through 6.1E) proceed. Another separate proposal is required for Action 6.2. Results of population status and life history studies should be provided that indicate/justify the need for a conservation hatchery.

4. M&E (section G, and F)

The response has not included an M&E section. Objectives 2 and 3 do have some specific monitoring tasks or elements included in section F, so there is planned and ongoing monitoring of lamprey in the tributaries and at mainstem dams and collaboration with other agencies is proposed. For example, in Objective 2, Subtask (iv), the proponents indicate, “The Corps and the PUDs have invested significant resources in telemetry and PIT tag monitoring of adult Pacific lamprey at mainstem dams but there has been relatively little effort to monitor these same tagged fish in tributary streams of the Columbia River.” The proposal suggests additional tributary PIT tag detection arrays for lamprey, but it was not evident that this was being coordinated with the expanded and coordinated anadromous salmon and steelhead effort.

The response would be improved by development of a monitoring framework. The proposal does describe some of the elements of a broad monitoring plan in cooperation with other Columbia River Basin tribes, so this information could be put into a monitoring framework in this section for lower Columbia River tributaries.

Literature Cited

Geeraerts, C. and C. Belpaire, 2009. The effects of contaminants in European eel: a review. Ecotoxicology DOI 10.1007/s10646-009-0424-0