

Council Document ISRP 2000-4

**Independent Scientific Review Panel  
for the Northwest Power Planning Council**

**Review of  
The Confederated Tribes of the Umatilla Indian Reservation's  
"Restoration Plan for Pacific Lampreys (*Lampetra tridentata*)  
in the Umatilla River, Oregon"**

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## **ISRP Review of the CTUIR's "Restoration Plan for Pacific Lampreys (*Lampetra tridentata*) in the Umatilla River, Oregon"**

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) have provided a useful draft of a restoration plan for Pacific lamprey. The plan nicely summarizes considerable background and historical information on the lamprey and points to areas where little information presently exists. However, the technical and editorial quality of the plan needs improvement. The study design lacks specificity and technical details, for example no specific index reaches or plots are identified either in tables or maps, yet they are a critical part of the study design. Similarly, the monitoring and evaluation portion of the study design fails to identify specific restoration benchmarks, such as numbers of returning adult lamprey or larval lamprey densities in index plots, that could be used to judge program progress or success.

The draft will require considerable revision if it is to be a clear and persuasive document justifying and guiding the restoration program planned by the CTUIR and the Council. Although funding to begin this work has been assured, development of a high-quality plan and rigorous study design are essential for the project's success, including continued successful competition for Fish and Wildlife Program funds, defense of restoration of a non-salmonid species, and justifying both the concept and decision criteria for moving toward artificial production, which remains technically and socially controversial. Toward that end, we provide advice for improvement below. This advice is directed to the project sponsors rather than policy-makers.

### ***General Comments:***

1. The introduction, background, and historical analysis sections are well written and informative. They include information necessary for developing and understanding a plan.
2. The conceptual foundation is appropriate. However, it is easy to misinterpret Table 1 as the preferred conceptual foundation. A better text description is needed to contrast the old foundation from the preferred one. Great length is not needed, but enough words to clarify the intent. Further, it is not clear in the remaining text and plan that the new conceptual foundation was actually used. Some references to it in the plan would have better tied the concepts to the plan.
3. The plan uses the term "significant increases" many times, sometimes implying statistical significance and other times implying perhaps, something biologically meaningful. More precision with the text language would help clarify the intent.

In the same vein, do not base a decision on solely statistical significance. Rather the use of point estimates and confidence intervals (see D.J. Johnson, Wildlife Mgt., 1998) may prove helpful. Do not depend so heavily on tests of hypothesis, the results of which depend primarily on the sample size. Rather, estimate the increase (or decrease) of parameters and compute confidence intervals on them.

4. The recommendations for recovery listed in Chapter 5 seem unrealistic in tone, if not in intent. These actions are not, in fact, what the plan recommends. This section could be restructured to first note what is probably needed but not realistic (much of p. 37) followed by Table 3 with its prioritization, concluding with **recommended actions** at the end of the table. This chapter can lay out the ideal action plan and then present the logic and rationale for the recommendations of the recovery plan.

Accomplishing what is listed in Table 3 would certainly increase normative conditions in the Umatilla basin and provide an ecological boost to lamprey and salmonid populations there. However, much of what is listed may not occur due to biological or social constraints. One way to make the activities in Table 3 more realistic, and more directly link these activities to lamprey restoration, would be to rely on existing analyses of these limiting factors on salmonids. For example, has a watershed assessment been completed for the Umatilla Basin? If so, this should be integrated into the lamprey restoration plan. The watershed assessment would address some of the factors listed in Table 3, assess likely progress for each of the factors, and identify areas of improvement in each of these areas.

If a watershed assessment is not available, then some of the same analyses could likely be found or inferred from sources listed in the plan's bibliography (e.g., Boyce 1986; CTUIR 1990a, 1990b; Jackson et al. 1996, 1997; Kan 1975). The CTUIR references may prove to be the most helpful.

5. Chapter 6 (the restoration plan itself) is poorly presented and in need of the most revision and further development. It lacks a clear strategy; the existing plan summary on p. 4-42 is not a statement of strategy. The strategy appears to be to stock spawning adults obtained from the John Day River to augment spawners in the Umatilla River, monitor juveniles in the Umatilla for increases, monitor the John Day and Columbia Rivers for depletion, while conducting research to prepare for a possible artificial production program if it should be needed. If the plan is not more persuasive, it is likely to be viewed as an attempt to justify a hatchery. The primary goal of the plan is to restore lampreys to the Umatilla River. A well designed study and monitoring and evaluation protocol will help determine whether artificial production is needed as part of the restoration program.

A clear statement of strategy should precede a listing of objectives and any text describing the detailed plan. The bulleted objectives are then easily recognized as the key elements of that strategy.

6. With the exception of Objective 2, the objectives listed are tasks, rather than outcomes expected to result from the work. A clear statement of strategy would frame the objectives. The objectives seem to be the following: to increase the larvae in the river, as well as adults migrating into the river to numbers sufficient to sustain a harvested population; to test an artificial production scheme for potential use; to prevent damage to the remaining lamprey in the John Day or Columbia rivers.

To achieve these objectives one first must have some idea of the numbers of fish desired. The tasks and subtasks related to attaining these numbers include surveying the larvae and

adults before and after transplants, estimating reproductive success, experimenting with and evaluating artificial production approaches, and monitoring lamprey in the John Day and Columbia Rivers for detrimental effects. The plan would be informed by the use of baseline data from the 1998 and 1999 surveys. It will be extremely difficult to set useful recovery benchmarks for monitoring and evaluation without first identifying current abundance and distribution of adult and larval lampreys.

7. The draft guidelines in Attachment 3 are a strength of the plan but do not seem to have been used explicitly in the text. The guidelines should be the backbone of the strategy and detailed plan. The plan's text should demonstrate explicitly that the requirements of the guidelines are satisfied.
8. The last three chapters need careful attention to composition, grammar, and proofreading. They read as if done in haste without internal editorial review. These problems distract from the technical evaluation of the plan for a long term research and management program
9. Missing from the plan are any quantitative benchmarks for when artificial production will be needed. What numerical criteria will be used to determine that not enough larvae or adults are being produced from the inter-basin stocking program? Conversely, what numerical criteria will be used to determine whether enough young are being produced so that there is no need for a hatchery? What specific formulas and methods will be used to set numerical criteria upon completion of the first phases of this project?

***Detailed Comments:***

1. The map (Figure 1) does not contain most of the features named in the text. Locating these features is essential to the logic of the plan. For example, Three Mile Dam (referred to on page 14), Westland (p. 16), Cold Springs Reservoir (p. 31), McKay Reservoir (p. 31), Hermiston Dam (p. 32), Furnish Reservoir (p. 32), Coe Dam (p. 32), Echo (p. 32), and Yokum (p. 33) need to be shown.
2. What are attachments 1 and 2 (missing from the reviewed copy)? These should be integrated into the plan as tables or added as appendices, whichever is most appropriate.
3. The methods for mark and recapture are not clear, beginning on page 43 (Approach) and continuing into Methods (p. 44). What are "portable assessment traps?" If they are deployed at Three-mile Falls Dam, why the need for portability? Is capture at the dam the mark location, recapture location, or both? What is "the facility" noted on page 44? If lampreys are to be counted at the dam, why is a mark-recapture study necessary? A better description is needed.
4. How will index plots for larval collections be selected? Randomly? Habitat specific? How often will sampling be done? Will a multiple-pass system of electroshocking be used or single pass? What statistics will be used for estimating numbers from the samples? (pp. 43 & 44). The plan should describe how the index plots will be selected, and identify plot

locations with maps and UTM coordinates.

5. For the recently metamorphosed larvae, where and what is the trap noted on page 44? Is it the screw trap mentioned later? Where will that trap be located? Is it to be used in one spot only in the river, or moved to sample several locations?
6. The migratory pheromone paragraph (p. 45) suggests that the whole sub-project is based on three samples collected in 1999 that have not yet been analyzed. This appears to be unrealistic. A better description is needed.

In the same vein, substantial importance is placed on the role of the migratory pheromone as a stimulant to increase adult lamprey entries into the Umatilla River. Can the pheromone be synthesized and used to attract adult lampreys in addition to the pheromone production by juvenile lamprey?

7. As a stylistic matter, separation of the data analysis from the rest of the methods results in a choppy report that is hard to follow. It would be better to include data analysis as a final paragraph in each of the methods descriptions.
8. Under adult lampreys (p. 43), if you are counting all of them at the dam, why are mark-recapture statistics needed?
9. Under larval lampreys (p. 45), what is the Zippen formula? It would be helpful to have it presented and a reference to it provided.
10. Under migratory pheromone (p. 46), conducting statistical tests on three samples makes no sense.
11. The second paragraph of Approach on page 46 would be best placed first, so the context for using John Day as a brood source is understood (however, the third sentence is a method sentence and should come later).
12. Be cognizant of consistent use of past and future tenses, e.g., on page 47.
13. The rationale for studying caged larvae (p. 47) is not given in the approach section. How and when will the larvae in the cages be checked? It would also be a good idea to repeat this study in the John Day River as a control.
14. In the section on nest sampling (p. 49), the plan needs to describe the procedure for selection of 1 of 10 nests. For example, select a random digit 0, 1, 2, ..., 9, say 7 then take the 7<sup>th</sup>, 17<sup>th</sup>, 27<sup>th</sup>, etc. The plan states "*Percent egg viability comparisons will be made within the Umatilla River and between the Middle Fork John Day River. Comparisons of egg viability will be qualitative*". We suggest that you estimate the percent viability in each with a confidence interval using the nest as the experimental unit (sample size).

15. The section and table on flows (p. 48) do not explicitly say that the flows averaged from 1904-1926 will be the target flows. Are they?
16. The data analysis sentence for adult outplants is not data analysis (p. 48).
17. The data analysis sentence for flows is not data analysis (p. 49).
18. How will the redd surveys (p. 49) be carried out? Complete coverage? Sample sites? How will sample sites be selected? What will be the disposition of sampled eggs? Will they be returned or killed? The plan needs to describe a random or systematic procedure for sampling reaches of the stream, if 100% of the Umatilla River is not going to be surveyed. Use a procedure similar to that used to sample coastal streams for coho juveniles. Describe the survey procedure. Is it enough to just walk the stream bank?
19. Why be satisfied with only a qualitative comparison of egg viability? (p. 50)
20. Objective 4 is better stated in the paragraph on Approach.
21. The notion of straying is odd, as used on page 54. How can a population that does not home to a maternal stream but rather follows flows to wherever there is adequate water for spawning be considered “straying?”
22. Where are the traps noted under objective 4 to be fished and where will fish be released?
23. The concentration of formalin noted on page 52 is sufficient to pickle a fish (i.e., kill it).
24. Watch for incomplete sentences on page 52 and poor English on p. 53.
25. It would be helpful to keep the same order of topics on p. 54 as listed on the previous page.
26. In general, the risks section (Chapter 7) should show some correspondence to the attachment on guidelines.