



Independent Scientific Review Panel

for the Northwest Power & Conservation Council
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Memorandum (ISRP 2011-12)

May 17, 2011

To: Tony Grover, Director, Fish and Wildlife Division, 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) - Objective 3, Task 3B, Subtask (i)

Background

At the Northwest Power and Conservation Council's April 19, 2011 request, the ISRP reviewed a response from the Columbia River Inter-Tribal Fish Commission for an Accord project titled, *Tribal Pacific Lamprey Restoration Plan Implementation* (2008-524-00). This project has undergone several ISRP reviews. In the most recent review, the ISRP provided specific recommendations on each proposal objective ([ISRP 2010-16](#)). This review concerns only proposal Objective 3, Task 3B, Subtask (i) to plan, prioritize, and implement mainstem juvenile lamprey habitat inventories. As part of this task, CRITFC intends to collaborate and share resources with USGS, USFWS and others. The ISRP requested that a separate proposal be developed for this task.

The ISRP's 2010 comments on Objective 3 included:

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.

The ISRP's review of the response follows below.

ISRP Recommendation

Response requested

ISRP Comments

The proponents make the valid point that little is known about juvenile lamprey abundance and habitat use in the Willamette River even though the Willamette supports one of the largest populations of lamprey in the Columbia Basin and is an important fishery for Native Americans. They appear qualified to conduct the research based on their past work with lamprey and reports and peer reviewed publications. The proponents have provided further details on methods to reach the objective above and have modified the original “plan to develop a plan” to a “pilot” project that should enable the study to move forward. The ISRP believes that gaining an improved understanding of lamprey ammocoete distribution, abundance, and habitat selection is justified, even essential, to provide the information to guide fish and wildlife actions in support of lamprey.

The general design of the proposal is sound; however, there are significant questions mostly concerning details of the sampling design and procedures that require clarification. They are as follows:

1. Rationale for site selection and statistical aspects of sampling representative habitats to estimate ammocoete abundance

The proponents should provide more detail on the “random stratified sampling design” that will be used to select sample locations and how it will be used to select streams and sampling sites. The ISRP concludes that a summary of the lamprey ammocoete and adult tracking information that was used in selecting those locations should be provided, thus justifying this sampling plan.

The proposal is for a “pilot” study for only two locations (Clackamas and Santiam Rivers) in the Willamette Basin. They have not presented convincing justification of why a relatively intensive two tributary “pilot,” rather than a broader geographic sampling is the most efficient strategy to begin the investigation. The decision to conduct pilot sampling in the Clackamas and Santiam Rivers is based on recent ammocoete and adult tracking. However, the proposal did not adequately address the question of whether adult tracking information is available for some of the smaller streams that are tributaries to the Willamette River. The ISRP is concerned about river choice because several of the smaller rivers (Pudding, Molalla, Yamhill, Tualatin and Calapooia) and their tributary ditches are silt laden and silt is often associated with the presence of ammocoetes. An ISRP member has experience with the upper reaches of the Pudding River and in the 1950s-60s saw thousands of 6-7 inch ammocoetes in the debris when ditches were cleaned out by back-hoes in the Lake Labish area. Ammocoetes were still observed in the same area 5-10 years ago (specifics can be provided). The finding was unexpected, but with little knowledge of the species, perhaps it is the norm. Is adequate adult tracking information available for all of the smaller streams mentioned above?

The ISRP suggests consideration could be given to initial sampling with a much broader scope for the smaller streams and ditches of the Willamette Basin, instead of putting detailed effort into

only two locations. The Torgerson and Close (2004) work on the John Day River, mentioned in the proposal, seems like an excellent approach.

Comparing capture results by habitat classification type to allow extrapolation of the relative numbers of ammocoetes seems appropriate. Moser et al (2007) are cited as authorities for selecting optimal and suboptimal sites (“Type 1 – Optimal” and “Type 2 – Sub-optimal”). More detail about this classification system is needed including what types of habitats are considered “optimal” and “suboptimal” and why.

Evaluation and specification of how many replications of each habitat type will be necessary to estimate relative ammocoete abundance and capture efficiency within appropriate margins of error is needed. Sampling effort (without specific sites and numbers of samples to be taken at a site) is only generally described as “during August and September.” Frequency (except for a one month return survey to describe/compare temporal abundance and distribution for the above surveys) is not justified. Would surveys based on GRTS be an alternate approach for sample site selection? The proposal indicates that capture results for each habitat classification type will be compared with the relative proportion of this habitat that is available in the tributary being sampled. How will relative proportion of each habitat type be estimated and what habitat classification system is being used? The issue of “resource selection/preference” mentioned in the ISRP’s previous review was not addressed in the response.

What is the justification for measuring river temperature, flow, conductivity, substrate size and wetted channel as possible variables in a multiple regression to estimate lamprey abundance? Relative abundance will be estimated as “the number of ammocoetes shocked and captured, divided by the mean number of ammocoetes captured.” Why is relative abundance calculated this way rather than as number/m²? Logistic regression will be used to analyze relative abundance data. Are there other appropriate statistical methods for analysis? Further justification of using logistic regression is necessary.

2. Statistical aspects of sampling ammocoetes to estimate length frequency distributions

More justification for anesthetizing and handling a 10% subsample of ammocoetes for evaluating length distribution is necessary. A power analysis is needed to evaluate if this proportion is adequate, or excessive, for length distribution estimation with adequate precision.

Will age of larvae be determined from the distributions and, if so, by what technique? At what spatial scale will the distributions be determined? Will it be at the subbasin scale (e.g., mainstem Santiam, North Fork and South Fork), tributary scale (e.g., North fork Santiam), or at the scale of the individual streams selected for sampling?

3. Statistical aspects of sampling ammocoetes to determine genetic diversity

The objective pertaining to genetics is rather open-ended and brief. The objective would benefit from more detail about how comparison of genetic structure of ammocoetes collected by this project will be compared to that of adults derived from samples collected in 2009 and 2010? At what spatial scale will the comparisons be made? What will be learned from the comparisons? How will stock structure shed light on run timing and river of entry, as indicated in the proposal?

A summary of the current status of genetic identification of Columbia River lamprey populations is needed, with an indication of whether this is exploratory research or whether progress has been made and if there is evidence for providing useful information for lamprey management.

Verification should be provided showing that the number of ammocoete fin clips will be adequate for determining genetic diversity and for relating migration behavior and destination with genotypes from radio-tagged adults.

4. Sampling method information required

Exploratory research to test efficacy of deepwater suction, passive collection, and baited sampling should be designed not only to determine feasibility but also to provide estimates of precision of abundance for use in designing future studies.

It would be helpful to describe the netting procedures for the ammocoetes, whether by electrofishing, suction dredging, or another method. Very young ammocoetes can easily pass through the ¼-inch mesh nets commonly used in fisheries survey work. Even yearling ammocoetes can pass through such nets on occasion. Fine mesh netting will be necessary to capture small individuals, and this may pose sampling problems in coarse substrates where gravel and cobbles can damage fine netting.

Additionally, obtaining tissue samples (e.g., fin clips) from very small individuals for genetic analysis, or marking individuals with latex injection, may be physically harmful to young specimens less than several centimeters long.

More information should be provided on baited traps. The hay bale trap was intriguing and more information is needed on how hay bales, after being submerged for a period of time, will be sampled. Because ammocoetes are filter feeders, using traps baited with salmon carcasses may not be the most efficacious method of capture. If this has worked elsewhere, more details on the method would be helpful.

Further details are also needed on backpack electrofishing. How are the proposed methods similar to those used by Torgerson and Close (2004)?

5. Collaboration

Further details are needed on the degree of collaboration with ODFW and USGS that is actually planned. The proponents state they are going to share sample designs and promote standardized techniques, but are they really going to be using methods that will allow data sharing (or not)?