



Independent Scientific Review Panel

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

Memorandum (ISRP 2011-18)

July 13, 2011

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

From: Rich Alldredge, ISRP Chair

Subject: Follow-up Review of CRITFC Accord project, Tribal Pacific Lamprey Restoration Plan Implementation (2008-524-00) - Sub-proposal for Objective 3, Task 3B, Subtask (i)

Background

At the June 22, 2011 request of the Northwest Power and Conservation Council, the ISRP reviewed a revised sub-proposal and response document for the Columbia River Inter-Tribal Fish Commission Accord project, *Tribal Pacific Lamprey Restoration Plan Implementation* (2008-524-00). This project has undergone several ISRP reviews. This review concerns only a sub-proposal for Objective 3, Task 3B, Subtask (i) to plan, prioritize, and implement mainstem juvenile lamprey habitat inventories. The ISRP reviewed an initial sub-proposal for this task and requested a response on May 17, 2011 ([ISRP 2011-12](#)).

ISRP Recommendation

Meets scientific review criteria (qualified)

Qualification: The ISRP suggests that the study plan, while generally complete, requires additional details with regard to some aspects of the study. The deficiencies identified below should be addressed during finalization and adjustment of the study design as the project is further developed and implemented. Review of this project by the ISRP at the completion of the year of pilot work is warranted.

ISRP General Comments

The proponents have modified the sampling methodology/design and have expanded the sampling to several new locations in addition to the Santiam and Clackamas Rivers. The progress reports on earlier phases of the lamprey study in the Willamette Basin are impressive. This should be a worthwhile new pilot study as new data are collected and evaluated. However,

some important design and method details remain unspecified and are the basis for the ISRP qualification. These deficiencies need to be addressed during finalization and adjustment of the study design. Consultation with statisticians, such those funded by BPA for this purpose, is recommended. This project should be re-evaluated following the pilot year's work.

ISRP Specific Comments

In our May 17, 2011 review of the sub-proposal ISRP found that the general design of the proposal was sound; however, there were significant questions, mostly concerning details of the sampling design and procedures that required clarification. These questions are listed below with our evaluation of the proponent's responses.

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

The proponents should emphasize a statistically-defensible sampling program rather than the opportunistic work plan laid out in the proposal. The response did not adequately address this aspect of the ISRP request. The proponents propose to sample two riffles and two pools per reach. They did not explain how these units were selected (randomly or otherwise?) nor did they explain why this number of units was chosen. Will this small number of units be adequate to provide sufficient statistical rigor in analyses. It is unclear why riffles will be sampled (are pools assumed to be inaccessible for electrofishing?). Do the proponents expect riffles will provide adequate habitat for juveniles? Reaches and habitat units with fine-grained substrate should be targeted, as proposed for the Marys River sampling. The proponents should define criteria for identifying sampling reaches as upper, middle, and lower river system. The proponents propose to categorize abundance as rare, abundant, or absent. They did not specify the criteria that will be used to assign abundance estimates to each category. Why not use estimates of relative abundance for the analyses?

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

Details are required on methods to infer ages from length frequency distributions as well as justification for the occupancy model they plan on using. These methods are not simple and involve assumptions about how to differentiate age classes when portions of the length-frequency distribution overlap. Perhaps the proponents should consider some lethal sampling to validate age estimates.

The proponents should have provided more detail about the occupancy model they intend to use. For example, why choose an occupancy model for the analyses, what are the data requirements, outputs of the model, and assumptions?

3. Statistical aspects of sampling ammocetes to determine genetic diversity

Although more background rationale was provided by the proponents, statistical information on sample sizes is still required. A description of the relationships between the proposal and the related CRITFC Accord Proposal, Tribal Pacific Lamprey Restoration Plan Implementation ((2008-524-00) - Task 3.3A dealing with genetic analysis)) is also needed and information on how the results of the genetic analysis will assist lamprey restoration and management should be provided.

The proponents should explain how genetics will be used to determine migratory behavior, as requested by the ISRP. Analysis of juveniles to infer spawning locations of adults presumes an understanding of migration of larval stages from spawning sites to juvenile rearing locations

Tissue samples for genotyping are being collected from both migrating adult and juvenile lamprey. The purpose of the analysis is described differently in the proposals and reports provided as appendices to the revised proposal. The proposal states “The combination of adult and larval genetic information should help define the ‘level’ of population substructure that exists within the Willamette basin.” Appendix A, Migration characteristics and habitat use of the imperiled adult Pacific lamprey in the Willamette basin: prelude to estimating requirements for persistence, states: “Our goal is to determine whether any genetic variation in microsatellites coincides with distinct migration behaviors and especially location of spawning.” How the adult and juvenile samples will be combined and treated in analysis is not clear to the ISRP. Are the juvenile samples intended to be offspring from the adults sampled in 2009 and 2010? If this is the case have enough adults been sampled given the size the population that spawns throughout the basin? To evaluate if genetic variation coincides with migration patterns or spawning locations, these need to be defined prior to analysis. It is not evident in the results that have been presented that distinct migratory types exist. Analysis of juveniles to infer spawning locations of adults presumes an understanding of migration of larval stages from spawning sites to juvenile rearing locations. Inference about “stock structure” from juvenile samples will be complicated by potential confounding of family versus “stock” relationships of the individuals sampled (Anderson et al. 2008, Kalinowski 2010).

Anderson EC, RS Waples, ST Kalinowski. 2008. An improved method for estimating the accuracy of genetic stock identification. *Canadian Journal of Fisheries and Aquatic Sciences* 65:1475-1486.

Kalinowski ST. 2010. The computer program STRUCTURE does not reliably identify the main genetic clusters within species: simulations and implications for human population structure. *Heredity* (Published online).

4. Sampling method information required

The Information provided is satisfactory.

The ISRP remains intrigued by the “Exploratory Methods” for trapping ammocoetes and wishes a little more detail had been provided in the response. Drawings of the passive collection devices would have been helpful. Both types of passive collection methods - traps baited with salmon carcasses and artificial substrate (straw) - warrant comparison to the electrofishing surveys of abundance in order to determine if ammocoetes are ranked similarly (rare, abundant, or absent) between electrofishing and passive collection in the same location. The ISRP suggests that the proponents examine the length of passive collection, i.e., time in the stream, to determine the optimum period for fishing the traps or artificial substrates.

5. Collaboration

This proposal component was removed, as explained in the cover letter.