



Independent Scientific Review Panel

for the Northwest Power & Conservation Council
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Memorandum (ISRP 2009-44)

October 29, 2009

To: W. Bill Booth, Chair, Northwest Power and Conservation Council

From: Eric Loudenslager, ISRP Chair

Subject: Final Review of Accord Proposal, Resident Fish Research, Monitoring, and Evaluation proposal (#2008-109-00)

Background

At the Council's September 30, 2009 request the ISRP reviewed the Colville Confederated Tribes' revised proposal, *Resident Fish Research, Monitoring, and Evaluation* (#2008-109-00), which is a Columbia River Fish Accords project. The proposal was revised in response to the ISRP's August 4, 2009 review ([ISRP 2009-34](#)). The stated goal of the project is to improve the basic understanding of the population dynamics of rainbow trout (*Oncorhynchus mykiss*) within the San Poil Subbasin by examining movements and winter ecology among life histories. Specific project objectives include identification of spatiotemporal patterns in movements and spawning areas among life histories within the San Poil Subbasin; identification of overwintering areas of rainbow trout; and the investigation of how winter ecology of each present life history is associated with warm groundwater presence, river ice, and other habitat parameters to assist in determining where essential thermal refugia habitat exists to aid the Tribes in management decisions on where conservation and enhancement actions will provide the greatest benefit to the fish.

On August 4, the ISRP requested a response and concluded that, "while this proposal addresses a potentially important factor limiting abundance of trout in the San Poil River, the approach using radiotelemetry of adult fish and searching for groundwater refuges is unlikely to yield information that is critical to management decisions concerning trout habitat. A much stronger approach would be to focus on age-0 trout as they enter their first winter – their distribution, habitat requirements, their movement (if any) to find those habitats, and their survival. This would enable the Colville Confederated Tribes to identify specific stream reaches that are important for preservation and possibly restoration."

The ISRP requested a revised proposal that:

1. better establishes the current status of the trout resources in the San Poil, identifying the information needed to develop management actions to remediate winter habitat bottlenecks
2. includes age-0 fish abundance and early winter habitat use in the proposed survey

3. discusses more fully the role of groundwater expected in the San Poil system and re-examine the scope and effort to be expended
4. provides the needed site description, maps, genetic analysis, etc.
5. more fully describes the proposed visual and video surveys relevant to task 2.1 if they remain as part of the proposal
6. explains how movement data from radio-telemetry of 15 adults per life-history type can provide adequate information for making critical management decisions.

The ISRP's review follows below organized by these six items.

ISRP Recommendation

Meets Scientific Review Criteria (Qualified)

Qualification: Sample size justification for the radio-tagging components is necessary. A statistical power analysis that demonstrates that proposed sample sizes will be sufficient to achieve project objectives is required (refer to item 6 below). The statistical analysis of the experimental design should be reviewed by the ISRP before beginning the radio-tagging.

The data this project collects could be of value for developing management strategies for rainbow trout in the San Poil River drainage. The ISRP urges sponsors to continue to work to establish unambiguous hypotheses (questions) that can be answered using the experimental design proposed and to develop a stronger rationale that radio-tagging is the best method to gather the data needed for management.

ISRP Comments

1. The current status of the trout resources in the San Poil, identifying the information needed to develop management actions to remediate winter habitat bottlenecks

The revised narrative provides two additional pages of text summarizing the status of rainbow trout in the San Poil. The salient conclusion from the additional material is that a systematic evaluation of the range of life-history variation and plasticity, and life-stage survival and abundance in San Poil River rainbow trout is lacking. There have been various *ad hoc* efforts to collect data on limited aspects of migration from Lake Roosevelt into the San Poil, summer distribution, over-winter survival, and such. However, most of these efforts apparently have not had an experimental design that permits making informed statements and descriptions about the range of life-histories, plasticity of life-history types, proportions of the life-history types, abundance, and life-stage survivals.

In the problem statement the proponent states that coastal cutthroat trout are occasionally observed. This would be a range extension for this sub-species. If cutthroat trout have been observed they are most likely west-slope cutthroat (*Oncorhynchus clarki lewisi*).

Knowing the movements of maturing adults from various life-history types in the fall and winter, their over-wintering, and spawning locations could be important for developing management strategies for improving the status of rainbow trout in this watershed. However, it appears that a complete life-cycle assessment is actually needed. The proposal does not explain why the adult

life-stage and spawning locations are the top priority. A statement is provided on pages 4 and 5 that other studies will investigate juvenile survival. It would be constructive to develop a clear framework for assessing the species in this watershed.

Some evidence is provided for mortality of young-of-the year or yearling trout during the winter season. But this is expected, and no evidence is provided that this mortality is excessive when contrasted to other systems. Additional statements in the proposal indicate that summer habitat is also limited, for example the observation that once perennial streams are now intermittent.

2. Age-0 fish abundance and early winter habitat use in the proposed survey

The proponents state than juvenile fish will be evaluated using other funding sources. A comprehensive life stage-specific assessment of the species is not described in the proposal.

On page 11, under task 1.2, methods. The final paragraph states that 30 juvenile rainbow trout will be collected and implanted with radio-tags. There is no explanation of how these fish will be assigned to life-history type or what the purpose of this tagging and movement assessment is.

3. The role of groundwater expected in the San Poil system and re-examine the scope and effort to be expanded

Additional consideration of the role of groundwater in the San Poil system is not provided. Furthermore, the explanation of task 2.2: Quantify the extent and thermal properties of warm groundwater areas, is not sufficient. There is not a description of a systematic effort to locate and map groundwater reaches (for example, Forward Looking Infrared [FLIR] technology has been used for this purpose in the John Day subbasin). From the narrative, it appears that locating groundwater areas will be opportunistic. One opportunistic approach is to identify these locations when tracking radio-tagged fish. This is likely to bias mapping of groundwater sites. It is difficult to conceptualize how resources selection (selection of preferred over-wintering habitats from the range of those possible) can be inferred from the study design. The proposal does not identify how the data will be analyzed or interpreted.

4. Site description, maps, genetic analysis, etc.

The genetics report was provided.

5. Description of the proposed visual and video surveys relevant to task 2.1 if they remain as part of the proposal

A citation for the visual and video techniques is provided, but the summary paragraph is confusing. It is not clear how the sites for visual and video examination are selected, and how it will be determined that these are “preferred fall/winter habitat (page 12). If trout are located, it will be clear that these are reaches/habitats that are occupied by trout. But concluding that trout prefer these habitats, or survive better at those sites than at others may not be reasonable.

6. Explanation of how movement data from radio-telemetry of 15 adults per life-history type can provide adequate information for making critical management decisions.

The inferences that will be made from these observational studies and how the data will be analyzed are not provided. The sponsors propose to implant 15 individuals from each life history type over two years (105 total) and 30 juveniles in 2012. The published studies that were referenced did not provide justification for the sample sizes used in that work. Several of the hypotheses of interest in the Brown and Mackay (1995b) study were found to be statistically insignificant. A finding of non-significance means that either there was no difference or that there was not enough evidence to detect a difference. An adequate power analysis by proponents is necessary to demonstrate that the proposed sample size is sufficient to detect meaningful differences associated with fish movement.