



Independent Scientific Review Panel
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Memorandum (ISRP 2009-34)

August 4, 2009

To: Tony Grover, Fish and Wildlife Division Director, Northwest Power and Conservation Council

From: Eric Loudenslager, ISRP Chair

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

Background

At the Council's July 10, 2009 request, the ISRP reviewed the Colville Confederated Tribes' *Resident Fish Research, Monitoring, and Evaluation* proposal (#2008-109-00), which is a Columbia River Fish Accords project. The goal of this 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.

Recommendation

Response Requested

The ISRP concludes 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.

A revised proposal is needed that:

- a) 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

- b) includes age-0 fish abundance and early winter habitat use in the proposed survey
- c) discusses more fully the role of groundwater expected in the San Poil system and re-examine the scope and effort to be expended
- d) provides the needed site description, maps, genetic analysis, etc.
- e) more fully describes the proposed visual and video surveys relevant to task 2.1 if they remain as part of the proposal
- f) explains how movement data from radio-telemetry of 15 adults per life-history type can provide adequate information for making critical management decisions.

Overall Comments

Although reviewers in general support of examination of winter habitat as a critical limiting factor, additional information is needed to adequately assess the expected benefits to resident fish in the San Poil system. Other than a general increase in the information on over-winter ecology of rainbow trout, it is not clear what the primary management challenges are, what data are needed to help determine management alternatives for addressing the challenges, and how best to obtain the data. The proposal's focus is on adult fish, while juvenile fish entering their first winter are overlooked. Included is a combination of habitat surveys, fish counting, and radio-telemetry to provide data for management, but the details of the methods are not adequate to evaluate the sufficiency of the effort.

Specific Comments

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

The stated overall goal of this project is “to improve the basic understanding of the population dynamics of rainbow trout within the San Poil Subbasin by examining movements and winter ecology among life histories”. The proposal identifies two critical information needs (Objectives) to be addressed: 1) description of spatial and temporal distribution, movement, and spawning preferences for the four rainbow trout life-histories observed in the San Poil Subbasin; and 2) identification of rainbow trout over-wintering locations and habitat choice and associations in the San Poil Subbasin. Each of these objectives addresses a conservation and enhancement need for native redband rainbow trout in particular, including identification of habitat strategies and limiting factors in the Subbasin.

However, the scope of the proposal could be improved for several reasons. First, it does not draw upon the established understanding of trout ecology in the San Poil based on the data that have been accumulated by years of CCT monitoring. Second, it is not designed to produce “action items” - it does not discuss how the research results could be applied to enhance wild trout growth and survival in the San Poil. As written, the proposal is a set of (valuable) tools (radio-telemetry and video monitoring, presumably under ice) but without a specific application to management decisions. Rather than just “improve basic understanding,” the proposal could and should be reshaped to examine the extent to which winter is a bottleneck for wild trout. That would enable CCT staff to begin identifying the specific vital stream reaches to preserve and possibly restore.

The proposal lacks basic description of the stream, its habitat, and the fish resources. There is no map. More details are needed on the results of genetic analyses summarized in the proposal. The Young et al. (2008) paper looks like a special WDFW report not easily accessible to reviewers - a copy or a link to an electronic document should be provided.

The proposal shares virtually no specific biologic information from the years of San Poil monitoring to date, such as the status of the rainbow trout life-history types and recruitment to both San Poil River and Lake Roosevelt populations. However, two important statements are provided. First, "Rainbow trout tributary spawning habitat is limited within the San Poil Subbasin (Gillin and Pizzimenti 2004) and early fisheries investigations indicated that a lack of high quality spawning and rearing habitat was a limiting factor to adfluvial rainbow trout production in Lake Roosevelt (Scholz et al. 1986, cited by Gillin and Pizzimenti 2004)." Second, "Recruitment of adfluvial rainbow trout into Lake Roosevelt is likely highly dependent on surviving the first winter in spawning tributaries or the mainstem of the San Poil River. Furthermore, abundance estimates drastically decline between the fall and spring within the San Poil Subbasin (Kirk Truscott, Colville Confederated Tribes, Personal communication)." Based on these statements and on numerous similar observations for several species in many western US streams, reviewers believe that the proposed work should focus on factors affecting survival of trout during their first winter in addition to work on adult fish.

Winter survival of adults is typically much higher and their habitat requirements (different from those of 0+ fish) are much better understood; in most western US streams studied to date, winter has not been shown to be a bottleneck for adult trout. On the other hand, trout entering their first winter are under severe metabolic constraints (relatively low fat reserves but higher metabolism than larger trout), vulnerability to predation, especially mammals and birds, and need for concealment cover during the day and some food at night). Such concealment cover is typically along the stream margin (or in side channels) in dense woody debris or interstitial spaces among larger rock. This is different from the deep slow habitat (beaver ponds and high-quality pools) used by adult fish for aggregation.

A major goal of the proposed work is to identify groundwater influx. The proposal says: "We hypothesize that larger juvenile and adult rainbow trout will aggregate in areas with warm groundwater influx and moderate to deep water depth. Identification of warm groundwater areas will not only provide information on valuable winter habitats, but these groundwater areas can also provide thermal refugia for fish during summer when ambient water temperatures reach high levels." Unfortunately, the proposal refers only to studies supporting the value of groundwater as winter habitat, but it is clear that in some elevations and thermal regimes groundwater influx creates unsuitable (surface-ice-free and very dynamic) habitat for all sizes of trout. This was shown by Lindstrom and Hubert (2004, cited in the proposal) in a third-order western Wyoming stream at 2400-2600 m elevation.

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

Project proponents (subcontractors) are experienced researchers familiar with the equipment and field experience for a rather complex radio-telemetry study.

Some methods are not adequately described. Work under task 2.1. is intended to identify over-wintering locations of rainbow trout. Visual and video surveys would be conducted to identify locations of over-wintering rainbow trout. "One survey will be conducted in late fall (likely in

early November) before the onset of ice cover. Another survey will be conducted later in the winter after ice cover is well established. Surveys will be conducted in the mainstem of the San Poil River, and in several tributaries. Areas above barriers where isolated redband rainbow trout are located will also be targeted. Visual and video techniques (described in Mueller et al. 2006) will be used to identify over-wintering locations.” These surveys require additional description to show that they are sufficient to determine the winter holding reaches. The specific methods, including sampling design, for measuring water (and air?) temperatures are not described. The observational regime for recording ice conditions (temporal and spatial coverage) is also unclear. Also, they could easily be expanded to include age-0 fish. That effort should begin when stream temperatures begins to drop below 45 degrees F, often in September – October and can be done by daytime backpack electrofishing of stream margin habitat (for details see Griffith and Smith 1993, Griffith and Smith 1995, Contor and Griffith 1995).

It is not clear that the radio-telemetry of 15 individuals per presumptive life-history type is sufficient to expand the conclusions to inferences about the population as a whole. Increased analytical and statistical power could be achieved by expanding the budget to overcome the stated budgetary limitations.

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

The project is a research enterprise aimed at a few critical uncertainties about redband rainbow trout life histories and habitat use. Reporting of findings through PISCES, project reports, and technical journals is a critical for this kind of project.

Citations

- Contor, C.R. and J.S. Griffith. 1995. Nocturnal emergence of juvenile rainbow trout from winter concealment relative to light intensity. *Hydrobiologia* 299: 179-183.
- Griffith, J.S. and R.W. Smith. 1993. Use of winter concealment cover by juvenile cutthroat and brown trout in the South Fork of the Snake River, Idaho. *N. Amer. J. Fish. Mgt.* 13: 823-830.
- Griffith, J.S. and R.W. Smith. 1995. Failure of submerged aquatic macrophytes to provide overwinter concealment cover for juvenile rainbow trout in a large Idaho river. *N. Amer. J. Fish. Mgt.* 15: 42-48.
- Young, S. F., C. Bowman, D. K. Hawkins, and K. I. Warheit. 2008. A genetic analysis of trout from the tributaries on the Colville Reservation – Part 2. WDFW Molecular Genetics Laboratory, Olympia, Washington.