



Independent Scientific Review Panel
for the Northwest Power & Conservation Council
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Memorandum (ISRP 2010-20)

June 16, 2010

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

From: Eric Loudenslager, ISRP Chair

Subject: Final Review of the Confederated Tribes of the Warm Springs Reservation's Fish Accord Proposal, Project, *Natural Production Monitoring and Management* (#2008-311-00)

Background

This memo contains the ISRP's final review of the Confederated Tribes of the Warm Springs Reservation's revised Accord Proposal *Natural Production Monitoring and Management* (#2008-311-00). The revised proposal states that the project goals are to 1) continue the annual life stage monitoring of wild steelhead and spring Chinook salmon populations in Reservation streams, and 2) provide management and co-management direction of the fisheries resources in the Deschutes River Basin.

This proposal was originally submitted as two proposals to the ISRP for review in November 2008. One of the proposals was for spring Chinook, and the other was for steelhead. On December, 12, 2008, we requested additional information before we could determine if the proposals met scientific criteria. Specifically, the ISRP found that the proposals did not contain sufficient information regarding details on the methods for each of the objectives, how the projects would inform management actions, and the benefits to the targeted fish populations. For both projects, the ISRP noted that the levels of culture and release of fish for testing supplementation appeared to be of sufficient scale to warrant a Three-Step Review and compliance with Northwest Power and Conservation Council Artificial Production Review policies, and possibly development of an HGMP.

On May 13, 2010, the Council forwarded to the ISRP the revised and combined proposal and requested review, which follows below.

ISRP Recommendation

The ISRP specifies recommendations for each of the objectives under the project's goals.

Goal 1. Continue and improve annual life stage monitoring of wild spring Chinook salmon and steelhead in the Warm Springs River Basin and Shitike Creek.

Objective A) Juvenile Outmigration Monitoring – *Response Requested*

This task requires further detail as well as attention to methodological problems. See details below.

Objective B) Collect tissue samples for genetic analysis of *O. mykiss* in the Warm Springs River drainage – *Does Not Meet Review Criteria*

The use of genetic analysis to identify individual resident versus anadromous smolts has yet to be demonstrated, and most existing data from other subbasins would suggest this differentiation unlikely.

Objective C) Summer rearing snorkel surveys – *Response Requested*

Methods for snorkeling are very general, and it is not clear if standard methods are being followed. Statistical methods are not adequately explained, and it is not clear how presence or absence data in the lower Warm Springs River will tie in with “quantitative” snorkeling upstream. The proponents also need to provide information on methods for obtaining presence or absence data in the lower reaches. See details below.

Objective D) Spawning ground (redd) surveys – *Response Requested*

Statistical methods for redd survey data are not given in detail, and the proponent should provide justification that the effort will provide adequate precision. See details below.

Objective E) Enumerate adult escapement into Shitike Creek and the Warm Springs River – *Response Requested*

The proposal requires inclusion of statistical methods as well as information on any plans to improve weirs so they work at high water. See details below.

Objective F) Estimate harvest of Chinook salmon and Steelhead in the Deschutes Basin – *Does not meet review criteria*

Creel census methods are not described in sufficient detail. Proponent is encouraged to coordinate with CRITFC harvest monitoring projects. See details below

Goal 2. Provide management and co-management direction of the fisheries resources in the Deschutes River Basin

Objective A) Cooperate in Deschutes River Basin Fisheries Management Activities – *Response Requested*

The ISRP concluded this objective has a strong policy element. Protocols for monitoring and evaluating the effectiveness of management programs should be specified. See details below.

Objective B) Provide co- management and assistance with fish handling at the Warm Springs National Fish Hatchery – *No Recommendation*

The ISRP concluded this objective has a strong policy element. The ISRP was unsure if evaluation of this use is within the scope of this review and hence did not comment on this sub-objective.

In sum, Goal 1 (adult, smolt, and juvenile fish counting) includes tasks to collect data that are necessary to assess fish populations for management, but the proposal does not justify the goals and techniques associated with the tasks. A response is requested to address previously identified issues concerning the precision necessary to meet management objectives. Fundamental operational concerns remain regarding the stratification scheme and use of a single rotary screw trap. The specific management tasks to be accomplished under Goal 2 such as setting harvest seasons and creel limits are required to meet review standards. The effort for each task, the sufficiency and utility of the data collection, and description of how the data from Goal 1 will effectively inform management are required to meet review standards.

ISRP Comments

Important tasks of status and trend monitoring necessary to direct the management of Chinook and steelhead in association with an expanded supplementation program within the Warm Springs basin were described in the revised proposal. However, a greater level of design detail is required to permit the ISRP to evaluate the scientific merit of the proposed efforts. Moreover, the ISRP recommends that the project biologists enlist statistical assistance to review data collected-to-date and to assist in the development of a management framework that includes directions to collect relevant biological information for decision making. Despite having over thirty years of data in hand, a summary analysis or a presentation of basic population-focused results such as adult, smolt, and juvenile data that would be part of a co-management framework is lacking.

Relevance to management actions and benefit to fish

While the proponents did provide a basic presentation of data on the Chinook and steelhead adult returns since 1975 and 1977, respectively, additional analyses or discussion of results, other than mention that the specific causes for these variations and recent decline are unknown, is necessary. Exploration of these data is necessary to demonstrate the use of such information for management purposes. Inspection of the adult data raises the suspicion that trends in abundance mimic ocean conditions, and this needs to be explored. There is also a need to split the life stage analyses into freshwater (adult-smolt) and ocean (smolt-adult) components to fully interpret the recruitment information. This also applies to using jacks to predict subsequent adult returns, in good versus poor years of returns. Additionally, smolt estimation techniques from RST should be further explored. Peterson M-R is not effective for this (Mäntyniemi and Romakkaniemi 2002).

In addition, adequate information or results and trends from redd surveys, smolt yield estimation, snorkel or electrofishing surveys should be provided from past years of data collection. Harvest results were also not presented. Adequate justification was also lacking to provide management advice. A decision plan should be provided describing target reference points for decisions such as adult recruits per spawner or smolt recruits per spawner. There was emphasis that continued collection of these data allows for comparison of multiple life stages for each brood year, such as potential egg deposition, egg-to-fry-to-smolt survival, recruits per spawner, and smolt-to-adult returns. However, the ISRP cannot evaluate if the data actually enable comparisons, since the metrics were not provided.

On page 8, run size objectives were provided. How were these derived? The proposal would be improved by a description of the process the proponents used to determine these values and, furthermore, provide the list of management actions that are triggered at varying levels of return, indicating targets and limits.

Although efforts are being made to assess habitat restoration, identify areas of high or low productivity, and provide information on annual trends of productivity, the proposal would be improved by information on how this is actually going to be done.

Details on methods

Goal 1. Continue and improve annual life stage monitoring of wild spring Chinook salmon and steelhead in the Warm Springs River Basin and Shitike Creek.

Objective A) Juvenile Outmigration Monitoring

This part of the proposal requires further detail as well as attention to methodological problems. For example, the ISRP cautions against anesthetizing and/or PIT-tagging all captured smolts. Separate marking and recapture locations are preferred for smolt estimation with rotary screw traps. Similarly, justification of the number of fish to be handled to estimate trap efficiency should be provided. The level of stratification proposed for species, sizes, and age classes will likely provide spurious results – recapture rates will likely be too low for this level of stratification. Evaluation of sample size requirements in advance is highly recommended and should be available for reviewers. The proposal would also be improved by provision of a statistical basis for numbers of fish to be PIT tagged – at present it appears an opportunistic tagging program is proposed, which is not scientifically defensible.

Objective B) Collect tissue samples for genetic analysis of *O. mykiss* in the Warm Springs River Drainage

The ISRP recognizes the value the proponents are placing on integrating genetic-based identification into the tasks, especially for pre-migratory smolts and juveniles. However, the overall description is too general and needs specific background information and design to permit a complete review of the task. Specific comments from the ISRP are given below.

The genetic analysis of steelhead does not meet scientific review criteria. A better justification for the first sub-objective (i.e., “evaluate the genetic structure of *O. mykiss* in the Deschutes basin”) is needed. This objective needs to be justified based on recognition that past work has been inadequate to manage the species. There should also be a direct link to a need for this information for current or anticipated management decisions. Any justification should summarize the current status of genetic data baseline information for *O. mykiss*, identify how those baselines are deficient, identify what is needed to bring the baseline into compliance with contemporary management, and identify that the tasks in the proposal will rectify the deficiencies.

The second sub-objective (“to sort and enumerate resident versus potentially anadromous smolt size juvenile *O. mykiss*”) does not meet scientific review criteria as well. Evidence from the Deschutes or other basins is lacking that marker genes discriminate smolt versus resident *O.*

mykiss, or that there are functionally isolated subpopulations producing one life-history type or the other. There was an attempt to justify the genetic sampling routine on the basis of anadromous versus resident rainbow trout. Some a priori investigation seems justified – are these resident males (progeny of wild anadromous adults?) or residualized hatchery steelhead (males) that failed to migrate? Do they spawn together? What biological criteria are used to separate the identification of resident fish, parr, and smolts? Typically, smolts are silver, thin, and > 13 cm, but there are several other cues, e.g., blood tests. A lack of genetic differentiation between resident and anadromous brown trout as well as Atlantic salmon has been reported to be common. There has been recent effort in the nearby Walla Walla River (e.g., Narum et al. 2004), which should be reviewed in relation to the steelhead biology in the Warm Springs Basin.

Finally, the ISRP noted the proponents state that they “will continue to collect samples from *O. mykiss* in the Warm Springs Basin in 2010 and beyond (or at least until objective #1 above has been satisfactorily answered).” However, it is not clear what is meant by “satisfactorily answered.” How will satisfaction with the answer be determined?

Objective C) Summer Rearing Snorkel Surveys

Methods for snorkeling are very general, and it is not clear if standard methods are being followed. Statistical methods are not adequately explained. Nor is it clear how presence or absence data in the lower Warm Springs River will tie in with “quantitative” snorkeling upstream. The proponents also need to provide information on methods for obtaining presence or absence data in the lower reaches.

The proponents state that a selected number of pools will be repeated as index sites in day and night dives each year for direct annual comparison. How will the required number of pools to be selected be determined? That is, how will the sampling effort be established to ensure meaningful comparisons among years? Justification for selecting “70 pools and 25 riffle segments in 13 stream reaches” for sampling should be provided to ensure this sampling effort is appropriate for study purposes. Once population estimates are created, specifically what “statistical tests” will be performed to investigate the data?

Objective D) Spawning Ground (Redd) Surveys

Statistical methods for redd survey data are not given in detail, and the proponent should provide justification that the effort will provide adequate precision. Increasing prespawn mortality for Chinook is a cause for concern and should receive more attention with respect to climate change. The ISRP also noted the methods used to calculate prespawn mortality need to be improved – “Prespawning mortality is estimated for populations in the Warm Springs River Basin by fish per redd ratios. These ratios are dividing the total number of fish passed at the WSNFH by the number of redds counted in the upper basin.” The proponents should confirm that fish that did not build a redd in the upper Basin actually died in these reaches and did not spawn downstream. Direct counts of dead unspawned fish might be a better metric.

Objective E) Enumerate adult escapement into Shitike Creek and the Warm Springs River

The proposal requires inclusion of statistical methods as well as information on any plans to improve weirs so they work at high water. Are electronic methods proposed? The data gap during high water for steelhead enumeration may make this objective difficult to reach.

Objective F) Estimate harvest of Chinook salmon and Steelhead in the Deschutes Basin

Creel census methods are not described in sufficient detail to evaluate this objective. The proponents should coordinate with CRITFC biologists doing similar work in Zone 6 in the lower Columbia River (Proposal 2008-502-00). Some of the same fishing methods are being used.

Goal 2. Provide management and co-management direction of the fisheries resources in the Deschutes River Basin

Objective A) Cooperate in Deschutes River Basin Fisheries Management Activities

The ISRP concluded this objective has a strong policy element. Protocols for monitoring and evaluating the effectiveness of management programs should be specified. Development of indicators may be a worthwhile approach (see the ISRP report, Input on Evaluation of Regional Coordination Projects, [ISRP 2007-14](#)). The specific management tasks (i.e., setting harvest seasons and creel limits), effort for each task, and how the data from Goal 1 are to be used, and measures to determine if the data are sufficient, would be required to evaluate this objective.

Objective B) Provide co- management and assistance with fish handling at the Warm Springs National Fish Hatchery

The ISRP concluded this objective also has a strong policy element. An exception is the use of WSNFH as a production facility as well as “a tool to improve and enhance runs of wild steelhead and spring Chinook” which is a science issue. The ISRP was unsure if evaluation of this use is within the scope of this review and hence did not comment on this sub-objective.

Supplementation test

There was little or no mention of this component that appears to have been removed from the original proposal, but the test appears to be a primary justification for the proposed work. A linkage or discussion of the relevance of the Chinook hatchery program or the steelhead hatchery strays to natural production monitoring and management should be. Given that it seems no hatchery fish are allowed above the weir at the Warm Springs River National Fish Hatchery (page 15), perhaps impacts of hatchery fish on natural production are less of an issue. The proposal would be improved by providing important details such as the release sites for hatchery smolts.

Literature Cited

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