

Northwest Fisheries Science Center
Resource Enhancement & Utilization
Technologies Division
2725 Montlake Boulevard East
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21 August 2002

Northwest Power Planning Council
Attention: Judi Hertz
Response to ISRP
851 SW 6th Avenue, Suite 1100
Portland, OR 97204

Dear Ms. Hertz,

Enclosed are responses to the Independent Scientific Review Panel (ISRP) comments for Project 35049 (A multi-scale evaluation of steelhead supplementation in the West Fork Elochoman River) under the Mainstem and Systemwide Province review process. The National Marine Fisheries Service (NMFS), Northwest Fisheries Science Center (NWFSC), Resource Enhancement and Utilization Technologies Division (REUT) has proposed continuation of this project because of the critical need to maximize productivity and minimize risks of captive broodstock programs for ESA-listed species. Please contact Stephen Riley of my staff (360-871-8315) if you have any questions.

Sincerely,

Dr. Robert N. Iwamoto
Director

cc: F/NWC2 - Flagg
F/NWC2 - Riley

Response to ISRP comments for Project 35049, “A multi-scale evaluation of steelhead supplementation in the West Fork Elochoman River.”

1) The release of parr in early summer is not a typical strategy and draws into question the appropriateness of this design as a study of steelhead supplementation. Releases of large parr in the fall or as smolts would be more typical. This does not negate the value of this study but it should likely be considered a fishery research project more than a production or supplementation assessment.

We propose to release steelhead as subyearlings in summer as an attempt to apply the principles of conservation hatcheries to our supplementation evaluation. Flagg and Nash (1999) suggest that conservation hatcheries release fish that are within the size range of wild fish, and it has been suggested that minimizing rearing duration in the hatchery may reduce developmental divergence from the ‘wild state’ (Reisenbichler 1997). We recognize that subyearling releases are not a standard practice in the basin, but more recent programs (e.g., Nez Perce Tribal Hatchery), including those for ESA-listed population (Redfish Lake sockeye), place a strong emphasis on subyearling releases for species that undergo smoltification as yearlings. Thus, a subyearling release strategy is tenable and should be evaluated to determine its effectiveness and impacts as the potential for future safety-net programs for steelhead increases (NMFS 2000).

2) The use of the North Fork as a comparative base is not well justified. How do the streams compare in productivity, habitats, etc. Further, the likelihood of visual redd surveys, as an adequate assessment of adult returns and the value of supplementation is very risky and inadequate in the ISRP’s assessment. There will be a substantial amount of information and effort relying on the final assessment of adult returns and the proposed monitoring of adult returns seems inadequate. Without addressing this issue, reviewers believe the project is severely compromised.

The North Fork Elochoman was chosen as a control stream for the supplementation evaluation because it is nearby in the same drainage and thus is likely to be similar to the West Fork in a number of characteristics (hydrology, geology, forest cover, temperature, productivity, etc.). Detailed habitat and productivity data are not currently available for these watersheds and rigorous comparisons are therefore difficult. If habitat and other data indicate that the North Fork is a poor control for the West Fork then other nearby streams could be used instead.

Standardized visual redd surveys are used state-wide by the WDFW to estimate adult returns (WDFW 1997). We intend to monitor spawning activity in the streams by walking their entire lengths at least twice per week when conditions permit, which will be sufficient to minimize the number of redds that may be missed or double-counted. Other methods of estimating adult returns in the two streams (e.g., construction of a weir) are impractical or too expensive. All hatchery-origin adults (and some marked wild adults that originated from our experimental sections) that return to the West Fork each year

will also be interrogated by the PIT-tag antenna at the mouth of the creek. Redd surveys were recently used by NMFS staff to evaluate adult steelhead releases into the Hamma Hamma River with good success.

3) There is no information on the hatchery rearing of the fish to be outplanted. How large will hatchery parr be, at what density will they be reared, how many will be tagged, and how will they be released? What is the basis of the 3000 parr to be outplanted? Is there a statistical basis for this value or is it based on some other criteria?

Hatchery fish will be reared in raceways at the Elochoman Hatchery using the protocols of conservation hatcheries (Flagg and Nash 1999). As stated above, fish will be released at a size similar to the size of wild fish of the same age. Because of the limited accessibility of the West Fork, fish will be released from buckets. Steelhead will be reared at 0.15 lb/ft³. All juvenile steelhead that are released will be marked with PIT-tags.

We estimate that experimental sections will likely need to be approximately 3000 m² in order to obtain sufficient statistical power to detect differences in growth and survival between treatment and control sites. We propose to release fish at approximately 1 fish/m² into treatment sites, which is near the upper limit of wild rainbow trout densities observed in the Columbia basin (Platts and McHenry 1988).; hence, the derivation of the number of 3,000 parr to be outplanted. Moreover, because each fish will be PIT-tagged, we proposed these small releases in order to minimize costs.

Other concerns

a) Monitoring of growth and survival will be quarterly and based on “night seining”. The proposal suggests the performance of the parr will be related to “their location within the site will be recorded.” How is this possible with night seining?

Night seining will be conducted in individual habitat units that are enclosed by block nets, allowing the location (i.e., habitat unit) where each fish was captured to be recorded.

b) Will the movement of parr downstream be monitored year round? If large numbers of parr are displaced (hatchery or wild) it would be necessary to know their fate within the tributaries. Presumably, some could move downstream of the final site and out of the tributary.

Movement of parr within the West Fork will be monitored year-round (quarterly) using portable PIT-tag detectors. Movement out of the stream will be monitored year-round by the PIT-tag antenna at the mouth of the stream. If large numbers of parr move out of the stream into the mainstem, the n portable PIT-tag detectors will be used to determine their distribution in the mainstem as well as within the West Fork.

c) Is it feasible to tag smolts or fall parr in the North Fork tributary to provide a marked population? This could provide a means or mark-recapture for smolt production and total adult census if a remote tag detection system was incorporated into this design.

We propose to mark all wild steelhead > 60 mm encountered in experimental sites on both streams. A remote detection system (PIT-tag antenna) will be installed at the mouth of the North Fork as well.

d) After this first out planting in 2004 there may be “residual” fish holding into the next year when the outplanting occurs. Has this been considered and how will these fish be treated?

The monitoring of residual steelhead in the West Fork is implicit in the proposal. All fish that remain within the West Fork will be sampled by seining, annual electrofishing, and portable detectors. Steelhead parr that residualize and remain in the stream will be repeatedly sampled. These methods will provide a good estimate of the extent of steelhead residualization in this stream.

e) We support the development of individual-based models and think they could provide a useful tool in assessing supplementation and generally about the salmonid production in streams. However, there is no comment on how to validate the model. How will this be incorporated into the development steps?

A preliminary individual-based model will be developed using the first three years of data and validated using the last two years of data. Validation of the final model should be undertaken on another stream; this is beyond the scope of this proposal.

Flagg, T.A., and C.F. Nash (editors). 1999. A conceptual framework for conservation hatchery strategies for Pacific salmonids. U.S. Dept. Commer. NOAA Tech. Memo. NMFS-NWFSC-38, 54 p.

NMFS (National Marine Fisheries Service). 2000. Endangered Species Act Biological Opinion regarding Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin. Northwest Regional Office, Seattle, WA.

Platts, W.S., and M.L. McHenry. 1988. Density and biomass of trout and char in western streams. Gen. Tech. Rep. INT-241. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 17 p.

Reisenbichler, R. R. 1997. Genetic Factors contributing to declines of anadromous salmonids in the Pacific Northwest. *In Pacific Salmon and their ecosystems. Edited by D. Stouder and R. Naiman, Chapman Hall, Inc. pp. 223-244.*

WDFW (Washington Department of Fish and Wildlife). 1997. Preliminary stock status update for steelhead in the lower Columbia River, Washington. Olympia, Washington.