

RRS Project Review

Project ID: 2003-063-00¹

Title: Natural Reproductive Success and Demographic Effects of Hatchery-Origin Steelhead in Abernathy Creek, Washington

Short Description: This project aims to evaluate the relative reproductive success (RRS) of naturally spawning hatchery and natural origin steelhead in Abernathy Creek, WA, and to assess the overall demographic effects of hatchery fish supplementation relative to two adjacent control streams, Germany and Mill Creeks.

Sponsor: U.S. Fish and Wildlife Service

BiOp association:

- RPA 63.1: Measure effect of safety-net & conservation programs
- RPA 64.1: Estimate relative reproductive success (RRS) of hatchery
- RPA 64.2: Determine if artificial production contributes to recovery

Is this an Accord project? No

Budget (2008 to present):

BPA	Total	\$4,890,724
	FY16	\$ 590,072
Cost share	Total	\$1,182,293
	USFWS	\$ 737,293 (2008-2014)
	WDFW	\$ 445,000 (2009-2014)

Proposal from last Categorical Review:

<https://www.cbfish.org/Proposal.mvc/Summary/RMECAT-2003-063-00>

Most recent Council recommendation:

<https://www.cbfish.org/Assessment.mvc/CouncilRecommendationAssessmentSummary/Assessment/2003-063-00-NPCC-20110125>

Date of most recent annual report available on Pisces/cbfish?

FY15 Annual Report. *Natural Reproductive Success and Demographic Effects of Hatchery-Origin Steelhead in Abernathy Creek, Washington*. Submitted April 2016.

<https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P148481>

¹ This is one of the six exclusively RRS projects in the program.

Short summary of project reporting compliance: Contract management and project performance has been excellent. Sponsor was on time with all annual reports. To date, 9 peer-reviewed scientific papers have been published from this project.

Summary of the scope of the project as it was reviewed by Council: The sponsors proposed to continue the project conducted at US Fish and Wildlife Service's (FWS's) Abernathy Fish Technology Center (AFTC) that was first approved for funding in 2004. Specifically, continue to evaluate relative reproductive success between hatchery origin and natural origin steelhead, simultaneously investigating methods of operating a conservation hatchery and the effectiveness of artificial production of an integrated broodstock on recovery.

Summary of the scope of the project now: This project has faced logistical challenges with executing field work and meeting the sample sizes required to have sufficient data to estimate RRS. Low genetic assignment rates suggest that there may be fish contributing to the population that are not being sampled, such as a resident rainbow trout population or juveniles spawned below the weir by non-sampled parents. Although genetic samples are still being collected from returning adults, it is not clear if the RRS portion of their project will continue. The sponsors suggest that the focus of their work should shift to investigating casual mechanisms for reduced RRS in integrated hatchery programs, and research of conservation hatchery methods.

Has the scope of this project changed significantly since it was reviewed? Yes. The sponsors have been unable to resolve the logistical challenges faced in trying to estimate RRS of hatchery and natural origin steelhead in the study streams. Small sample size and low parental assignment rates preclude strong conclusions regarding RRS in Abernathy Creek. Despite these challenges, this project is contributing valuable information on the relative fitness of hatchery steelhead from integrated broodstock programs. The sponsors are focusing on conservation hatchery practices that minimize genetic and ecological risks to natural origin populations, and furthering research into the mechanisms causing domestication selection in integrated hatchery programs.

Link to ISRP/AB Critical Uncertainties Appendix D review:

<http://www.nwcouncil.org/media/7149871/isabisrp2016-1appendixd.pdf#page=126>

Comments: This project has a strong link to the 2008 FCRPS BiOp (RPA 63.1, 64.1, & 64.2) and addresses critical uncertainties in the NOAA Fisheries ESA Recovery Plan for the Lower Columbia River Steelhead ESU. This project also responds to research priorities in the State of Washington's Statewide Steelhead Management Plan. The sponsor addressed all Council recommendations since the review, has been timely with all required deliverables and contracting deadlines, and the quality of their work is exemplary

"Multiple aspects of the current study require that any closing of the project occur in several phases to ensure complete collection of data and return on investment from fish that have already been produced. With the current contracting cycle, discontinuation of the steelhead smolt production would require advance notice of at least a single calendar year to avoid the requirement of euthanizing a year

class of fish. Additionally, BPA has already invested in the production of several year classes of steelhead that are currently at sea. Fish produced from the spawning run in 2014 would not return to the hatchery until 2017, and fish produced from the 2015 spawning run will not return to the hatchery until 2018. Similarly, fish being released this year (2016) will not return to the station until 2019, and fish that have already been spawned and will be released in 2017 will not return until 2020.”

Questions to all project sponsors with RRS studies:

- How does this project inform (1) the Council’s Research Plan and (2) the Council’s Fish and Wildlife Program objectives?
- Can any results from this study be extrapolated to other geographic locations or other populations?
- How does the Idaho Supplementation Study inform this project?
- Does this project have any of the following elements:
 - (a) A scientific question
 - (b) A hypothesis
 - (c) A specific time frame within which to answer the question posed
- How was it determined which species or geographic area to study?
- How does this effort work or collaborate with other RRS projects on aspects of the study (methodology, data and conclusions)?
- How does [density dependence](#) factor in to this study moving forward?

Questions relative to this project:

- The RRS elements of this project have been unsuccessful. Based on these experiences, what advice to other researchers do the sponsors have when selecting populations or geographic areas to conduct RRS studies?
- What valuable information has the project contributed to integrated broodstock programs?
- Which hatchery practices would be the focus of any future research? How long would it take to evaluate hatchery practices?