R & E Grant Application 17-19 Biennium

Project #: 17-014

Steelhead Residualism and Harvest in Detroit Lake

Project Information

Requested Cycle:	17-6
R&E Project Request:	$47,042
Other Funding:	$174,406
Total Project:	$221,448
Spending Start Date:	9/1/2017
Spending End Date:	3/31/2019
Project Start Date:	9/1/2017
Project End Date:	3/31/2019
Organization:	Oregon Department of Fish and Wildlife

Applicant Information

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Past Recommended or Completed Projects

This applicant has no previous projects that match criteria.

Location Information

Where is it?

The project will occur on public land owned or managed by another party

Landowner Information

Name: U.S. Forest Service
Address: 44125 N Santiam Hwy
Detroit , OR, 97360
Phone: (503) 854-3366

Site Description

Street Address, nearest intersection, or other descriptive location.
Detroit Reservoir

Directions to the site from the nearest highway junction.
Highway 22 near town of Detroit, OR.

Following project completion, public anglers will be allowed the following level of access to the project site:
Full access

Please describe what leases, easements, agreements are in place to ensure angler access to the project site, and what is the length of each agreement.
Angling is currently allowed in Detroit Reservoir and will continue during and after project completion.

Dominant Land Use Type:
Forest

Project Location

General Project Location.
County: LINN
Town/City: Detroit
ODFW Dist: South Willamette
Stream/Lake/Estuary Name: Detroit Reservoir
Sub-basin: 17090005

Specific Project Location.

Latitude	Longitude
44.72031	-122.24829

Project Summary

Project Summary

Please provide a couple sentence summary of the proposal.
The project will determine the rate that juvenile steelhead introduced into Detroit Lake

residualize into rainbow trout and are caught in the trout fishery. The conservation and recovery plan calls for steelhead re-introductions above Detroit Dam but residualism would impede recovery.

Overall Project Goals

Describe the primary goals or outcomes of the entire project, including elements not requesting funding from R&E.

The goal of the project is to provide critical information on residualism rates that will aid efforts to establish a self-sustaining winter steelhead population above Detroit Dam called for in the Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead.

Primary objectives of R&E funding

Please describe the measurable objectives for the R&E portion of the funding request.

The first objective is to quantify the proportion of juvenile steelhead released into the reservoir that residualize into rainbow trout.

The second objective is to quantify the extent residualized steelhead are caught in the trout fishery in the reservoir.

Current Situation/Justification

Please describe the current situation and explain why this funding is needed.

Detroit Dam blocks 60% of the historical spawning habitat of winter steelhead in the North Santiam basin and it is a major factor for their population decline. The conservation and recovery plan calls for reintroducing steelhead above the dam. Steelhead residualization, whereby juveniles cease downstream migration and revert into a rainbow trout life history, occurs for about 0-17% of hatchery fish released in rivers (Hausch and Melnychuk 2012). Recent studies suggest that juvenile steelhead in Detroit Lake may residualize at a higher rate. They were 5 times less likely to migrate out of the reservoir compared to Chinook salmon (Johnson et al. 2016). If residualization occurs at a high rate in Detroit Lake, fisheries managers would need to reevaluate the strategy of transporting wild adults above the dam since a self-sustaining population may not be achievable. PIT-tagged juvenile steelhead are currently in the reservoir and available for detection for a limited period of time. With this funding we can quantify residualization rates in the reservoir by detecting tagged fish that did not out-migrated as a steelhead smolt. Based on the results of this study, the recovery plan implementation can be modified to increase its chances for success.

Recreation and Commercial Benefit

This project will provide benefits to:

Recreational fisheries

Explain how this project will contribute to current (and/or potential) fishing opportunities, access, or fisheries management.

This project will inform the best approach for the recovery plan implementation. A successful recovery of winter steelhead in the Willamette basin could eventually result in harvest of wild steelhead in the basin.

Residulaized steelhead contribute to the trout fishery in Detroit Lake. Currently, we don't not know the extent this occurs. The creel survey will demonstrate the high level of angler use if the

trout fishery which will be important information to have as ACOE considers modifications to the current trout hatchery programs.

Percent benefit split between Commercial and Recreational anglers:

0 % Commercial
100 % Recreational

Please explain, or justify, how the percentage split was determined:

100% of the benefits will be for recreational anglers.

This project has been identified as an ODFW priority for:

Not identified

Does this project directly support implementation of the ODFW Strategic Plan and/or current Fish Division priorities?

Please briefly explain when this was identified as a priority and what process or workgroup was used to identified this as an ODFW priority.

Identify any plan or other document that identifies this priority.

Upper Willamette River Conservation And Recovery Plan For Chinook Salmon And Steelhead. http://www.dfw.state.or.us/fish/crp/docs/upper_willamette/UWR%20FRN2%20Mainbody%20final.pdf

Is this project part of an approved Salmon-Trout Enhancement Program (STEP) activity?

No

This project is intended to benefit the following species:

Winter Steelhead

This project will benefit anglers or fishery by providing:

Monitoring/Research

Monitoring/Research

This project will be used to evaluate:

Population composition (i.e age, species, survival, size, or genetics)
Out migrant/return rates
Angler satisfaction/harvest (Creel)
Distribution (i.e. presence, abscence, abundance)

Has this project been reviewed or developed by an individual with appropriate qualifications (i.e ODFW biometrician, research professor)?

Yes
This plan was developed by ODFW research biologist with consultation of OSU faculty (Dr. Jim Peterson).

Is this study critical to fishery management decisions?

Yes
Does residualism of juvenile steelhead that enter Detroit Reservoir prohibit a successful reintroduction program called for in the Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead?
Yes
If residualism proves to be high, improved fish passage at Detroit Dam will be needed or other recovery efforts will need to be prioritized.

Is there a plan to repeat this monitoring or research in the future?

No

Will the data be reported or published?

Yes

Results will be summarized and disseminated to managers in an ODFW Information Report and/or peered-reviewed journal article.

Project Description

Schedule

Activity	Date	RE Funding
Purchase PIT antenna and required electronic components and build towable antenna array.	Sep-Oct, 2017	Yes
Conduct PIT-tag survey using trawl/antenna array	Nov-Dec, 2017	Yes
Conduct creel survey of trout fishery in Detroit Lake	Jan-Dec, 2018	Yes
Analyze data and write report	March, 2019	Yes

Permits

Permit	Secured?	Date Expected
Boat Restricted Zone permit from USACE for working in Detroit Lake forebay	Yes	Oct, 2017

Project Design and Description

Please describe in detail the methods or approach that will be used to achieve the project objectives.

Trawling.- A small pair-trawl fitted with a PIT antenna will be used in 2017 to detect juvenile steelhead previously released in the reservoir in 2014 (n=6,957), 2015 (n=9,694) and 2016 (n=11,133). Trawling surveys will occur in November and December when the flood-control reservoir is at its lowest level and fish would be most concentrated and near the surface. All fish were age-1 at release so fish remaining in the reservoir at the start of this project would be considered residualized steelhead (i.e., they did not out-migrate as age-2 smolts). Previous research in the reservoir showed that juvenile steelhead are surface oriented (0-15 ft deep), especially during winter months (Monzyk et al. 2015). The surface trawl will be similar in size to the small trawl used to detect fish in the Columbia estuary (Ledgerwood et al. 2005). The trawl body will be 3.6 by 3.6-m wide at the front opening and taper along a 9.1-m long symmetrical body to the cod end where the antenna will be attached. The front of the trawl will have 4.8-m long wings that attach to 15-m long guidance netting that is 3.6-m deep where it attaches to the wings and taper to 3-m deep where it attaches to the spreader bar and towing bridle. A 4x4-ft PIT antenna opening at the cod end allowing fish to be detected as they pass through the trawl. A 12-ft pontoon barge towed behind the trawl will house the 12-V batteries and a Destron-Fearing IS1001 reader and data logger that will store codes from all PIT-tagged fish encountered.

The two boats will be approximately 75-ft apart as the array is towed 2640 ft (0.5 mi) per survey. Each day, we will conduct a survey in the upper, middle and lower portion of the reservoir with a minimum of 0.5 miles between surveys to assure the same fish is not detected twice in a day. The combined detections for each day will constitute a sampling event to be used in a Schnabel mark-recapture method to estimate the number of juvenile fish from each release year that have residualized in the reservoir. We estimate that we will need to conduct approximately 60 trawl surveys over 20 days (3/d) to achieve a robust population estimate.

Angler surveys.-A creel survey will be conducted in Detroit Lake in 2018 to assess the number of residualized steelhead caught in the trout fishery in the lake. ODFW personnel will conduct a

statistical creel survey to estimate angler effort and catch of juvenile winter steelhead and trout throughout the year. Surveyors will interview a representative sample of both bank and boat anglers in a stratified schedule to accommodate weekday and weekend fishing pressure. In addition to querying anglers about time spent fishing, fishing methods, catch by species (both kept and released fish), and lengths of fish kept, surveyors will scan all un-clipped rainbow trout with a PIT-antenna to determine if it is a tagged winter steelhead. Pressure counts of all bank and boat anglers will be conducted at the beginning and end of each survey day to expand angler catch data. Pressure counts will consist of a surveyor traveling the length of the reservoir in a boat and counting bank and boat anglers. Pressure count information will be combined with angler survey data to estimate total catch by species for the year.

Engineering

Does the project involve capital improvement, engineering, site grading or other construction?

No

Project Management and Maintenance

What is the life expectancy of R&E funded construction, structures, equipment, supplies, data or fishery?

Data acquired under this proposed work will become part of a database associated with the Conservation and Recovery efforts in the Willamette basin.

Who is responsible for long term management, maintenance, and oversight of the project beyond what is funded by R&E.

I am responsible for maintenance and distribution of the data, results of data analyses, as well as oversight of the monitoring project as a whole. The data acquired using R&E funds will be incorporated into existing data and analyses. We do not intend to request additional support from the R&E Board in future years.

Will the project require ongoing maintenance?

No

Is there a plan to collect baseline data and to conduct monitoring efforts to measure the effectiveness of the project?

No

Project Funding

Funding

Have you applied for OWEB funding for this project?

No

Has this proposal, or similar proposal for this project location, previously been denied by OWEB or other funding source?

[{"source":"Army Corps of Engineers","type":"Cash","secured":"Pending","dollarValue":174406,"comments":"We are currently seeking funds from ACOE "}]

Other Funding Source	Type	Secured	Dollar Value	Comments

Army Corps of Engineers	Cash	Pending	174406	We are currently seeking funds from ACOE
		Total	174406	

Budget

Item	Unit Number	Unit Cost	In-kind or non-cash contributions	Funding from other sources	R&E Funds	Total Costs
PROJECT MANAGEMENT						
Project Leader	0	9277.73	0	55667	0	55667
Project Assistant	0	8041.84	0	48251	0	48251
		SUBTOTAL	0	103918	0	103918
IN-HOUSE PERSONNEL						
Seasonal field staff/creel surveyor (9 mo)	0	5213.20	0	31280	15640	46920
Creel surveyor (3 mo)	0	4874.53	0	0	14624	14624
		SUBTOTAL	0	31280	30264	61544
CONTRACTED SERVICES						
			0	0	0	0
		SUBTOTAL	0	0	0	0
TRAVEL						
Motor pool rental truck (12 mo at $340/mo)	1	340.00	0	0	4080	4080
		SUBTOTAL	0	0	4080	4080
SUPPLIES/MATERIALS						
Fuel (boat and vehicle)	0	0.00	0	0	2698	2698
Trawl	1	0.00	0	0	2000	2000
Misc. supplies (ropes, etc.)	0	0.00	0	0	1750	1750
		SUBTOTAL	0	0	6448	6448
EDUCATION/OUTREACH						
			0	0	0	0
		SUBTOTAL	0	0	0	0
EQUIPMENT						
PIT transciever (IS1001)	1	3500.00	0	0	3750	3750
PIT antenna	0	2000.00	0	0	2500	2500
		SUBTOTAL	0	0	6250	6250
FISCAL ADMINISTRATION						
Overhead applies to ACOE funds (No OH for RE match)	0	0.00	0	39208	0	39208
		SUBTOTAL	0	39208	0	39208
		BUDGET TOTAL	0	174406	47042	221448

Internal Review Results

Review Score: 0.8 out of 3

(0 = Do Not Fund, 1 = Strengthen Proposal, 2 = Recommend, 3 = Strongly Recommend)

Summary of Review Team Comments

This proposal was not supported by the review team as the identified SFR funding is not currently available, making this a non-starter. The team also identified minimal to no identifiable benefit to sport or commercial anglers as proposed. The team felt RE was not the most appropriate source of funding and that this project should be funded by USACE as it related to their mitigation efforts. Review team scores included three 0s, four 1s, and one 2.

Specific Review Team Comments

Based on internal discussions the $174,436 of SFR funding identified is not earmarked for this project. Unless otherwise informed by management this project is not fundable. Even if it were, the RE request only amounts to a 21% match which is insufficient at SFR requires a 25% match.

Application states that "there are no anticipated recreational or commercial fishery benefits", but later states "most benefit will be for the recreational steelhead fishery." Unclear what the benefits to fisheries would be.

While this could help steelhead information it is very hard to figure out why angler dollars should be spent on this. It seems like unless the findings supports more reintroduction anglers lose out - Reduced residuals to catch as trout and/or reduced releases available for downstream harvest. If not done, the angler is unaffected.

The R&E vs. SFR funds in their budget are only 21% state match, so it would not meet SFR application requirements as is currently budgeted unless they have other state funded staff time or something else they will match for SFR minimum 25%. The indirect they show (39K) would be correct at 29% indirect. The applicant should also put all S&S on SFR instead of R&E and pay staff on R&E if there is no indirect on R&E money to save funds.

This research project does not have clear ties to how it would benefit sport anglers.

Residualism of steelhead is common with lake releases, it is unclear how the findings from this project would inform management changes to reduce this issue. It is unclear if SFR money has been designated to this project. This research and funding should be a mitigation responsibility of the USACE.

Could use more discussion of how the contribution to creel of residualized steelhead might be used in management of the rainbow trout fishery and how information collected would be used to modify the steelhead program.

An interesting project on a listed fish, but one that should not be funded by R & E.

The project has indirect (or at least longer term) implications for sport/commercial benefits that are tied to recovery (i.e., post-recovery harvest opportunity), but nearer term there may be implications for the management of the reservoir trout fishery related to whether or not reintroduction above Detroit continues. The proposal would be stronger in the R&E context if it focused on that nearer term, potentially more tangible relationship to anglers.

If you could tie the value of the creel to improving USACE acceptance of the trout fishery this might have some merit or benefit to the angler, but as designed that is not a part of the proposal.

Specific Review Team Questions

Are hatchery juveniles being used for this study? If so, how do they differ from wild juveniles in rates of residualism? Text states that evaluation is for transporting wild adults above the reservoir. Is there an evaluation of residualism in steelhead below the reservoir for comparison, or is that assumed to be similar to other studies? What is the status of successful downstream migration through the dam? What is the origin of the tagged juveniles. Are they natural progeny of wild adults passed upstream?

The juvenile steelhead currently in the reservoir were produce by the OSU Surrogate Project using wild winter steelhead adult broodstock. The goal of the Surrogate Project is to rear fish to mimic wild fish as much as possible in terms of morphometrics and growth rates. The fish reared in this program are the standard used for most dam passage studies in the Willamette basin.

The study by Johnson et al. (2016) release PIT-tagged juvenile steelhead above and below the dam and monitored detection rates downstream. Based on detection rates, fish released below the dam were 16 times more likely to be detected downstream. Although dam passage mortality could explain some of this difference, steelhead released in the reservoir were 5 times less likely to be detected than juvenile Chinook released in the reservoir (and experiencing similar dam passage conditions), suggesting that residualism is high to juvenile steelhead released in the reservoir. Residualism rates of juvenile steelhead in unimpounded reaches of the Willamette have not been studies but assumed to be similar to rates found in the literature for other basins.

Will the ACOE hatchery plans to be implemented later this year impact this project?

It is our understanding that ACOE hatchery plans would not affect trout release scheduled for 2018. Trout are still planned for release similar to previous years, just the source of fish is uncertain.

Please clarify this part of the application: “This project will provide benefits to: Recreational fisheries / There are no anticipated recreational or commercial fishery benefits”. The application also states on P4 that a "small fraction of adult steelhead could be caught by the commercial gillnet fishery in the lower Columbia". No commercial steelhead harvest is allowed. Steelhead have no commercial benefit. Why should the board fund something with R&E dollars that provides no benefit to sport or commercial anglers?

We clarified in the application that we believe there is a benefit to recreational fisheries. We removed the statement about potential catch of steelhead in the commercial fishery. The creel survey will provide information on the level of angler participation in the current trout fishery. This could be valuable information in the future as potential changes to ACOE hatchery plans are considered in the future.

We are not familiar with current anadromous fish reintroduction efforts for the upper N Santiam. Could an overview be provided? How long has it been going on? Where have fish been planted? Where are they captured (up and downstream)? Results to date? Reasons to believe that residualism is occurring?

Reintroduction of adult winter steelhead have not occurred yet and not anticipated until downstream dam passage improvements are completed in 2025. The juvenile winter steelhead in the reservoir currently are from a multi-year study investigating current baseline downstream passage effects (Johnson et al. 2016). The Johnson et al. (2016) study released PIT-tagged juvenile steelhead above and below the dam and monitored detection rates downstream. Based on detection rates, fish released below the dam were 16 times more likely to be detected downstream. Although dam passage mortality could explain some of this difference, steelhead released in the reservoir were 5 times less likely to be detected than juvenile Chinook released

in the reservoir (and experiencing similar dam passage conditions), suggesting that residualism is high to juvenile steelhead released in the reservoir.

If you find a significant number of residuals, what alternatives are available to having a successful steelhead program?

This study would estimate the residualism rate under baseline dam operating conditions. Possible alternatives could include increasing the spill rate to allow surface oriented juvenile steelhead to pass the dam more efficiently. In addition, the rate estimated from this study could be compared to the rate after downstream passage structures are completed in 2025 to determine if further passage improvements are needed.

Does the Willamette River Keeper intent to sue us over summer steelhead impact from this project?

The intent to sue will not negatively impact the project. If anything, the lawsuit highlights the vulnerability of the current summer steelhead program and the need to recover the winter steelhead population so that a future fishery will be possible.

Project Map



Additional Files

Budget Information

Maps

Project Map — *Map image of project location*

Photos

Design Information

Management Plans and Supporting Documents

Racial and Ethnic Impact Statement

Permits and Reviews

Partnerships

Public Comment

Letter of Support - Elise Kelley ODFW DB

Administrative Documents

Signature Authorization Page-ODFW

Completion Report

A completion report has not been submitted for this project.