R & E Grant Application 25-27 Biennium

Project #: 25-018

Investigating Ocean Migration of Steelhead Kelts

Project Information

Requested Cycle:	25-2
R&E Project Request:	$43,450
Other Funding:	$53,450
Total Project:	$96,900
Spending Start Date:	7/1/2025
Spending End Date:	6/30/2027
Project Start Date:	7/1/2025
Project End Date:	6/30/2027
Organization:	The Wilderness Calling Conservation Initiative (Tax ID #: 93-1267966)

Fiscal Officer

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Applicant Information

Name:	Ryan Sollee
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Past Recommended or Completed Projects

This applicant has no previous projects that match criteria.

Authorized Agent

Name:	Ryan Sollee
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Email: Ryansollee@gmail.com

Location Information

Where is it?

The project will occur Statewide

Project Summary

Project Summary

Please provide a couple sentence summary of the proposal.

TWCCI agents will be tagging Steelhead Kelts using Pop-Up satellite tags along several coastal rivers in Oregon. Little is known about Steelhead Kelt ocean behavior/mortality currently. The data we gather will arm management biologists with critical ocean migration, predation, and behavior information, ensuring Steelhead populations are available for future fishers

Overall Project Goals

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

To determine Steelhead kelt migration patterns and geographic limits along the west coast of Oregon based fish.

To determine mortality and predation rates of Steelhead kelts in the ocean.

To compare migration expansiveness, behavior and survivability of Wild vs Hatchery born kelts.

To educate the public on the data that Pop Up satellite tags provide.

To present our project to high school and college biology and ecology students to educate and inspire future generations about fisheries science.

Primary objectives of R&E funding

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

To gather concrete evidence of where ocean bound steelhead travel when they leave rivers and feed in the Ocean

To compare survivability and migration patterns of Hatchery vs. Wild Steelhead populations

To observe if Ocean Dead Zones are effecting Steelhead migration

To determine if global warming is effecting Steelhead behavior, and what waters they are inhabiting compared to historical data

Using satellite tags to determine how many predation events/attempts a steelhead can survive

To deliver a holistic Kelt survivability rate to managers at the conclusion of our study, to help biologists with population estimates

Current Situation/Justification

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

TWCCI has decided to proceed with our Kelt tagging study using Pop-Up satellite tags, after observing a successful implementation of a similar study in Southeastern Alaska as well as

Northern California, (both of these studies have informed management decisions and forecast models). While this is sure to provide amazing migration and mortality information about these economically and culturally important fish, the Pop-Up satellite tags are quite expensive. TWCII does have funding sources other than the State of Oregon, through private donors and other business through 1% for the planet, however this grant would ensure that we could tag enough fish in 2026 to conduct a scientifically significant study. The completion of this study will help local biologists understand the life cycle of Steelhead and how to best manage this species.

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 help fisheries management of Steelhead by giving biologists vital distribution and mortality data for Ocean migrating Steelhead. Specifically we hope to shed light on why Steelhead numbers in the Pacific Northwest have been generally declining over the recent decades. Currently the most recent study of Steelhead Kelts off the Oregon Coast was published in 1989. Since then, climate change, overfishing, and predation rates have significantly increased off the west coast, so the better we understand Steelhead behavior and life history in the ocean, the better chance we have of understanding and managing this fishery.

The following information will help managers preserve these fish for the future benefit of anglers:

-Where do Hatchery Steelhead migrate and do they survive predation compared to wild Steelhead.
-How many Kelts do we expect to return and spawn multiple times in Oregon Rivers.
-Is Climate change effecting where steelhead migrate in the ocean.
-What animals are eating steelhead in the Ocean.
-What are the migration limits of Oregon based Steelhead, and how far do they travel.

Percent benefit split between Commercial and Recreational anglers:

0 % Commercial
100 % Recreational

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

There isn't currently any commercial angling of Steelhead in the ocean off the coast of Oregon. So the only benifit will be to 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?

Yes

This project supports the implementation of the 25 year Recreational Angling Enhancement Plan, we aim to enhance recreational angling by using Pop Up satellite tags providing the best science available to assess fish populations. Additionally we will be educating young people, ideally inspiring young anglers to use this resource.

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

to identified this as an ODFW priority.

This project was vetted by Robert Bradley, District Fish Biologist on the Oregon Coast in January of 2025, his letter of support is attached explaining that this project is an ODFW priority, and that our project will provide insights into survival and migration patterns of Steelhead Kelts.

Identify any plan or other document that identifies this priority.

25 year plan, which identifies both using best science practices to asses fish populations, and education of the public regarding fish sciences under the strategies to enhance recreational angling.
https://www.dfw.state.or.us/resources/fishing/docs/25_Year_Recreational_Angling_Enhancement%20Plan.pdf

Coastal Multi-Species Conservation and Management Plan of which winter steelhead is included
https://www.dfw.state.or.us/fish/crp/coastal_multispecies.asp

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:

Education/Outreach
Monitoring/Research

Education/Outreach

This project will:

Teach the public about fish (ecology, life history) and/or fish habitat needs
Teach the public about Satellite Tag Technology and how they can be used to learn about life histories of not just steelhead but any fish.

The main focus of this project is to:

Create new educational progam
Support established education program

Is this education/outreach associated with ODFW efforts?

Yes
Angler education

This education/outreach effort will target:

Youth (< 18 years old)
Families (Youth and Adult family members/mentors)
Underserved populations
School groups

Number of people targeted by this proposal:

300

Estimate the average amount of time that each attendee will participate in the proposed effort.

1

Explain the duration/frequency of the proposed outreach effort.

We will be reaching out to High Schools and Colleges in the area and organizing field trips to

educate students about the unique life history of Steelhead, what we can learn using Satellite tags, and how be a effective citizen scientist.

In addition, we will be presenting information about our project to high school and college classes to help inspire students to become active in citizen science.

We are in current production of a documentary film which shows how we created and carried out our tagging project, we plan to use this film as part of our educational presentation about TWCCI and our satelite tagging project.

Will the developed materials be available for use by other organizations or the public(i.e curriculum, teaching techniques, educational strategies, materials)?

Yes

Yes, we would be happy to share our materials and the results of our study with any educational body that would be interested in using them.

Monitoring/Research

This project will be used to evaluate:

Population composition (i.e age, species, survival, size, or genetics)
Ocean Behavior of Hatchery vs. Wild Steelhead.
Out migrant/return rates
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 project has been developed and assisted by Alaskan Fish Biologists Dr. Kevin Fraley as well as Michael Courtney who has conducted several Pop Up tagging studies in Southeast Alaska, and authored numerous papers describing his findings. In addition, our project ahs been vetted by Regional ODFW Biologist Robert Bradley, who has assisted us in the design and scope of our tagging.

Is this study critical to fishery management decisions?

Yes

The management question TWCCI is attempting to answer is what happens to Steelhead Kelts in the ocean. Specifically where do they migrate, and what their rate of predation is. Additionally we are attempting to gather data on the successful Ocean Migration of Wild Steelhead Kelts vs. Hatchery Steelhead Kelts.

Yes

Population models for Steelhead are unique since they are one of the only salmonids that can spawn multiple times as part of its life history. Enlightening fisheries managers on the ocean migration and survivability can help managers better understand population density and spawning incidence. In addition, in future years of this study we will be comparing the migration behavior and success of Hatchery spawned fish vs. Wild fish, which will give fisheries managers a better idea of the repeat spawning success of Hatchery spawned fish, and what steps they can take to increase the number of repeat spawning Kelts.

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

No

Will the data be reported or published?

Yes
In accordance with our permit requirements, we are publishing an annual report of our findings. For our 2025 tagging season we are still waiting on our tags to pop off and download data once we have downloaded data we will be publishing our report for the 2025 season. We will publish a report for every year that we conduct the study.

Project Description

Schedule

Activity	Date	RE Funding
Obtaining Scientific Take Permit	9/1/2025	No
Purchasing 20 Pop Up Tags from Wildlife Computers	1/1/2026	Yes
First Day of fish tagging on Wilson, Trask, Nestucca, and Nehalem Rivers.	1/18/2026	No
Last Day of fish tagging on Wilson, Trask, Nestucca, and Nehalem Rivers.	5/15/2026	No
Data Collected from All Satellite tags	8/1/2026	No
Project Summary of Findings written and published	10/1/2026	No

Permits

Permit	Secured?	Date Expected
Our Scientific Take permit for the 2025 tagging season was obtained, the 2026 permit deadline is Sept 31, we will be acquiring this permit in early Sept 2025	No	9/1/2025

Project Design and Description

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

Steelhead Kelts will be collected by anglers and brought to various hatchery holding pens these fish will be tagged within 48 hours of being collected. In addition, Kelts will be collected by hook and line sampling by TWCCI permitted principle investigators. Regarding the hook and line caught fish, to ensure minimal injury, we will fish using barbless hooks and majority spay casting, which is the least invasive lowest mortality/harm method of fishing. Fish will be netted using a soft rubberized coated net so as not to disturb the slime coat or the scales of the fish. Only Female Kelts will be tagged in this study, since females have a higher incidence of repeat spawning, and a higher survivorship than male Kelts.

If a fish is determined to be a female Kelt, we will affix a satellite tag using the following step by step process to ensure minimal injury to the fish and maximum likelihood of a successful tag and eventual data collection:

1)Collected Steelhead Kelts will be placed in a fabricated custom tagging cradle, that has been used in other salmonid studies (e.g. Courteny et al. 2016b)

2)After the fish is cradled it will be blindfolded using a wet neoprene towel, to reduce visual stimuli that can contribute to stress and struggling.

3)Each Kelt will be assessed for sex, body condition, and injuries, to ensure the strongest healthiest female Kelts are tagged.

4)Each Mini Sat Tag will be externally tethered to each Kelt using a minimally invasive “tag backpack”, the backpack will be secured to the Kelt through the dorsal muscle, and pterygiophores, anchoring in the bony fin ray. This minimizes muscle damage to the fish as well

as ensuring minimal tearing due to the hydrodynamic drag though the water. To ensure the trailing tag and antenna do not interfere with the swimming or rub against the fish only Steelhead kelts larger than 65 cm will be tagged. This ensures that the tag is less than 2% of the body weight of the fish and is under the minimal accepted threshold for fish tagging.

6)Samplers will not use anesthesia (MS-222 or Aqui-S or Clove oil to tag fish for the following reasons:
-The incidence of human harvest and consumption in violation of the FDA's rules regarding the withdrawal time of anesthesia.
-Natural Predators consuming residual anesthesia.
-The standard practice of not using anesthesia when sampling large salmonids.
-Due to the remote nature of this work it is impossible to properly dispose of anesthetic in large tubs.
-Not having to revive fish after anesthesia will increase the efficiency of the tagging and minimize the time that the fish are out of their natural state.

Identifying Kelts:

When fish are caught, they will be examined and determined to be a Kelt. Kelts are identified by as being unusually skinny, usually with a post spawn concave stomach, as well as darker in color that non-Kelts. They are typically caught later in the range of the winter steelhead run and usually lower in the drainage than that of non-Kelts.

Tag Duration:

Pop Up tags will be programed for 60, 90, and 180 days to attempt to capture both long term and short term migration.

This project was designed and approved by Alaskan Fisheries Biologists Michael Courtney and Kevin Fraley who have who have conducted an identical study in Southeastern Alaska since 2018 and are experts in the field of pop-up satellite tagging of Salmonids.

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?

This Pop-Up tag project is a year to year project with no further maintenance or study needed past the tag duration pop off time, which is set, prior to releasing the tag.

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

There is no repairs/structure maintenance that is required for this project. TWCCI agents are responsible for the collection and dissemination of data for this project.

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?

Not necessary

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?

No

Other Funding Source	Type	Secured	Dollar Value	Comments
1% for the planet	Cash	Pending	19,750	There are over 200 Oregon Businesses that participate in 1% for the planet, at minimum we expect to get 5, $4950 donations from these companies.
Private Donations	Cash	Pending	19,750	In 2024 TWCCI raised $17000 in one month of fund raising from private donations, for the 2026 tagging season we are already fundraising and will continue through 2025
Salmon and Trout Enhancement Program Mini Grant	Cash	Pending	1,975	We have this completed and ready to submit
Fund Raising Events/TWCCI Movie Premiere.	Cash	Pending	1,975	We plan to hold several fund raising events in 2025 including a documentary release made about our tagging season in 2025.
Labor Cost	In-Kind	Pending	10,000	This is a n estimate of in kind labor cost based on 2025 effort.
		Total	53,450	

Budget

Item	Unit Number	Unit Cost	In-kind or non-cash contributions	Funding from other sources	R&E Funds	Total Costs
PROJECT MANAGEMENT						
		SUBTOTAL				
IN-HOUSE PERSONNEL						
In-kind labor costs for tagging and trapping steelhead kelts			10,000			10,000
		SUBTOTAL	10,000			10,000
CONTRACTED SERVICES						
		SUBTOTAL				
TRAVEL						
		SUBTOTAL				
SUPPLIES/MATERIALS						
Pop Up Satellite Tags.	22	3,950		43,450	43,450	86,900
		SUBTOTAL		43,450	43,450	86,900
EDUCATION/OUTREACH						
Production of an educational film detailing TWCCI activities, and research.						
		SUBTOTAL				
EQUIPMENT						
		SUBTOTAL				
FISCAL ADMINISTRATION						
		SUBTOTAL				
		BUDGET TOTAL	10,000	43,450	43,450	96,900

Internal Review Results

Review Score: 1.6 out of 5

(1 = Do Not Fund, 2 = Strengthen Proposal, 3 = Recommend with Conditions, 4 = Recommend, 5 = Strongly Recommend)

Specific Review Team Comments

This data would be interesting to have, but it may not have a direct impact on management decisions and it may not provide a direct benefit to the angler.

Please show your staff and volunteer time as in-kind match in the application.

Specific Review Team Questions

Will the sample size of 22 tags provide adequate data to make informed management decisions?

Regarding the comment staff and volunteer time as an in-kind match, I wasn't aware it should be included in the application. I've since included it in the project funding and budget section.

With regard to the comment about management decisions and benefiting anglers, we believe this study can directly benefit anglers. If we discover that Steelhead migration behavior and their populations are being negatively affected by a current policy, (for example commercial fishing pressure on other species in an area largely used by Steelhead Kelts), changing that policy could increase the numbers of returning Kelts, increasing the population potential and in turn benefiting anglers.

In addition if we can increase the number or Wild Steelhead returning with these policy changes, this can have a positive influence on the Hatchery fish as well. Leading to a potential increase in returning Hatchery kelts, providing a greater abundance of fish for anglers to harvest. Additionally if we discover that the vast majority of Kelts succumb to predation when they enter salt water, this can be taken into account when considering repeat spawning. This data can give managers and area biologists a better idea of spawning rates, and if they should consider repeat spawning as part of population and forecast models.

Regarding the number of tags (22) not being adequate to make informed management decisions. I wanted to mention that we are planning on carrying out this study over at least 5 years. In that time we hope to tag at least 100 fish and will be able to say with greater certainty where Steelhead Kelts migrate in the ocean, and what their migration patterns are. While the number of fish we are tagging is low compared to most fish studies, the quality of data from each tag is extremely valuable.

In addition, we've modeled our study on a similar study and subsequent research paper completed by the Coastal Marine Institute in Alaska on the Situk River (by Sietz and Courtney), similarly looking at migration patterns of Steelhead Kelts. This study was done over 3 years, in 2018 16 tags were deployed, in 2019 12 tags were deployed, and in 2020 35 tags were deployed, I've included the RESULTS page in the Additional Materials section of the application, which describes the number of fish tagged each year. From the results of this study the following connections to management decisions and considerations were made:

A federal example of a management decision due to this study: Courtney and coauthors' study

on Situk River steelhead Kelts explicitly states its results “can inform NEPA analyses and offshore resource-extraction planning,” mapping fish “days” inside Outer Continental Shelf planning areas and the depths steelhead occupy—information BOEM (Bureau of Ocean Energy Management) uses when evaluating lease areas and mitigation. -Bureau of Ocean Energy Management

Evidence of BOEM policy change due to the Situk study: The agency’s Alaska Annual Studies Plan lists (and cites) Courtney et al. (2022), showing Kelt-telemetry work feeding into BOEM’s ongoing research and environmental review pipeline. -Bureau of Ocean Energy Management

An example of State management decisions being made referencing this study: WDFW mirrors Courtney’s 2022 paper on its site and uses the same kelt-movement-at-sea picture (rapid offshore migration, surface-oriented behavior) in coastal steelhead briefings and town halls that frame season-setting and rulemaking. That’s not a line-item rule “because of Courtney,” but it’s clearly part of the scientific basis managers reference.

Related, current policy work: WDFW’s 2025 coastal steelhead rulemaking is leaning heavily on new marine-survival synthesis (Fish & Fisheries, 2025). That paper (and WDFW’s summary of it) cites the recent ocean-phase literature—including Courtney et al. (2022)—to explain low Kelt and recruit survival that’s informing conservative seasons. -WDF

Additional Files

Budget Information

Wildlife Computers Receipt	*Itemized Proof of Cost of Pop Up Tags*

Maps

Map of Fish Route TWCCI 2025	*Map Showing Fish Route from Nehalem River to Forks Wa.*

Photos

Photo Of First Tagged Kelt	*Tagged Kelt, Nehalem River.*
Photo Of Practice Tagging	*Photo of cradle placement on a Steelhead, practice tagging at Sandy Hatchery*

Design Information

Management Plans and Supporting Documents

1% for the Planet Profile	*Document proving TWCCI is a member of 1% for the planet*
CPF & TWCCI Partnership Letter	*Letter Describing Partnership between CPF & TWCCI*
Results Section of Situk Study	*Page showing the number of tagged fish on the situk study*
Situk Kelt Study.	*Cover page, Abstract and Kelt Distribution Map*
TWCCI Letter Of Introduction	*Intro Letter Explaining Organization and Project*

Permits and Reviews

NOAA Take Permit	*2025 permit approved by NOAA*
ODFW Scientific Taking Permit	*2025 permit approved by ODFW*

Partnerships

Public Comment

Robert Bradley ODFW Letter of Support	*A letter from an ODFW Biologist Supporting the TWCCI Tagging Project*

Administrative Documents

501 c 3 Certification	*501 c3 Certification of Charitable Partnership Fund*
Signature Authorization Page	*R & E Program Signature Page*

Completion Report

A completion report has not been submitted for this project.