

Planning and Combination (Planning and Acquisition) Project Proposal

Project Number	15-1322
Project Name	<i>Tucannon salmonid survival and habitat utilization</i>
Sponsor	<i>Washington Department of Fish and Wildlife</i>

List all related projects previously funded or reviewed by RCO:

Project # or Name	Status	Status of Prior Phase Deliverables and Relationship to Current Proposal?
	Choose a status	
	Choose a status	
	Choose a status	

If previous project was not funded, describe how the current proposal differs from the original.

*Please respond to each question individually. Do not summarize your answers collectively in essay format. Local citizen and technical advisory groups will use this information to evaluate your project. **Limit your response to ten pages (single-sided)**. You may delete the italicized portion of the questions and inapplicable supplemental questions to shorten the proposal.*

RCO Manual 18, Salmon Recovery Grants section and appendix references are available at www.rco.wa.gov/doc_pages/manuals_by_number.shtml.

Submit this proposal as a PRISM attachment titled "Project Proposal."

NOTE: Sponsors of barrier inventory projects should NOT fill out this proposal. They instead should use the Barrier Inventory Project Proposal.

1. Project Location.

This extent of this project includes the entire Tucannon River mainstem from the mouth to the upstream boundary of geomorphic reach 10.

2. Brief Project Summary.

This study will identify life-stage-specific survival rates for wild-origin juvenile spring Chinook salmon and summer steelhead in the Tucannon River, which in turn will help direct habitat restoration efforts based on survival and distribution of PIT tagged fish.

3. Problems Statement.

A. Describe the problem including the source and scale.

The Tucannon River once supported as many as 30,000 adult spring Chinook salmon (*Oncorhynchus tshawytscha*), and as many as 5,000 in the 1950's, but since 1985 escapement has typically been well below the de-listing geometric mean threshold of 750 and the restoration goal of 2,400-3,400 (SRSRB 2011). Historical estimates of summer steelhead in the Tucannon are not well known, but may have numbered as high as 2,500. Recent estimates of steelhead returns to the Tucannon River have averaged less than 200 wild origin adults/year based on PIT Tag returns. The decline of salmon and summer steelhead in the Tucannon River is likely due to numerous factors related to land use, water extraction, habitat loss, the Snake and Columbia River hydropower system, and fisheries. However, since 1985 habitat conditions have generally improved within the Tucannon River basin as water extraction and stream temperatures have been reduced, and habitat quality and connectivity have improved (SRSRB 2011). Despite these environmental improvements and the implementation of hatchery supplementation programs for both species, the abundance of each population has not increased. We propose a study focused on identifying survival bottlenecks affecting juvenile spring Chinook salmon and summer steelhead within the Tucannon River watershed.

The spatial structure of habitat use and associated survival rates within foraging, overwintering, and migration habitats are critical uncertainties (NPCC 2013). Another critical uncertainty is the accuracy of evaluating limiting factors under current procedures, which are typically based on geomorphic assessments and habitat surveys (NPCC 2013). This project will attempt to identify if, when, and where the population bottlenecks exist in the Tucannon River using juvenile survival and distribution data provided by the four instream PIT arrays.

B. List the fish resources present at the site and targeted by your project.

Species	Life History Present (egg, juvenile, adult)	Current Population Trend (decline, stable, rising)	Endangered Species Act Coverage (Y/N)
Spring Chinook salmon	juvenile	Decline	Y
Steelhead	Juvenile	Decline/stable	Y

C. Describe the limiting factors, and limiting life stages (by fish species) that your project expects to address.

This project aims to help identify limiting factors for juvenile life stages within particular sections of the Tucannon River. Typically, limiting factors have been assessed using a combination of physical habitat assessments (e.g., reach assessments) and expert opinion. This project would seek to refine the approach by using measured fish habitat utilization, survival, and mortality information to narrow the species-specific spatial and seasonal area of concern on which habitat restoration should focus. We conducted similar work in 2013 and 2014. Results from 2013 suggests that overwinter survival was quite low (~12%) for spring Chinook. We also saw fish emigrating from the spawning areas to overwinter in downstream reaches that are rarely targeted for restoration. Additionally, from the 1985 to 2009 brood years, the egg-to-emigrant survival for naturally produced spring Chinook was very low (mean = 5.6%, SD = 2.6%; Gallinat and Ross 2012), and it is thought to be as low for summer steelhead as well, though not specifically calculated due to difficulties in obtaining estimates on the number of spawners.

4. **Project Goals and Objectives.** *When answering the questions below please refer to Chapter 4 of the Washington Department of Fish and Wildlife's "[Stream Habitat Restoration Guidelines](#)" for more information on goals and objectives.*

A. What are your project's goals?

The goal of this project is to identify life-stage- and reach-specific survival, habitat utilization (i.e., seasonal distribution of fall-tagged fish), and to use this information to identify restoration priorities and potential population limiting factors.

B. What are your project's objectives?

- I. Estimate survival of fall-tagged parr to the lower Tucannon River and Lower Monumental Dam.
- II. Calculate reach-specific survival rates according to successful migration of tagged individuals past instream PIT tag detection sites.
- III. Describe the spatial distribution of overwintering juvenile spring Chinook salmon and steelhead within the Tucannon River mainstem.

C. What are the assumptions and constraints that could impact whether you achieve your objectives?

There are minimal constraints to the project as described because it is already adjusted to work within the restrictive permitting requirements of NOAA Fisheries. Of course, unforeseen logistical challenges like weather or river conditions could affect the project. Also, population limitations may affect the number of fish that can be captured and tagged. However, through 2 years of conducting this project, even at very low escapement (spring Chinook, 2013) we think we were able to capture enough juveniles to quantify survival from the subsequent juveniles.

5. Project Details.

A. Provide a narrative description of your proposed project.

We will utilize a spatially balanced sampling design that is customized to our target species (i.e., spring Chinook salmon and steelhead) to representatively tag fish throughout the Tucannon River. We will use electroshocking to capture fish and tag up to 6,000 steelhead and 3,000 spring Chinook salmon. Once capture and tagging is complete in the fall, we await spring emigration and download the pertinent data from PTAGIS.org at which point initial evaluations of survival and movement are possible. Final modeling work will occur the next fall (for spring Chinook salmon) once individuals that may have residualized can be detected on a spawning migration and removed from the model. Steelhead have a more complex life history and waiting two years to define migrants versus residents would be prudent. Progress, observation, and preliminary and final results will be shared with the RTT and SRSRB staff throughout the process.

- B. **Provide a scope of work.** *Provide a detailed description of the proposed project tasks, who will be responsible for each, what the project deliverables will be, and a schedule for accomplishing them. If the project will produce a design, please specify the level of design that will be developed (conceptual, preliminary, or final). Planning projects should typically be completed within 2 years of funding.*

[Task 1. Convene a meeting of the Co-Managers \(NPT, CTUIR, WDFW\) to define the level of impact \(tagging numbers\) before the study begins.](#)

Task [12](#). Fish capture and tagging – this effort will be lead by WDFW’s Snake River Lab (Michael Gallinat) and will take place in the fall of 2016 and fall of 2017. Deliverable – uploaded tag files to PTAGIS for subsequent analysis.

Task [23](#). Detection history summary – led by WDFW staff (Jeremy Cram) using queries and data manipulation related to PTAGIS information (Initiate Fall 2016-Winter 2018; interim report Fall 2017).

Task [34](#). Scale age analysis (steelhead only) – WDFW’s scale lab will be responsible for assigning ages to each marked steelhead juvenile (Collection during tagging, analysis complete Fall 2017; additional analysis for fish sampled in 2017 will be complete Fall 2018).

Task [45](#). Cormack-Jolly-Seber model development and implementation – WDFW staff (Dan Rawding and Jeremy Cram). The spring Chinook model is already operational and the steelhead version is being developed for the 2014 work – subsequent modifications and improvements will occur as needed (interim report Fall 2017; final report Winter 2018).

Task [56](#). Presentation of findings to RTT – WDFW (Jeremy Cram) will report information about fish survival and movement, habitat utilization, and subsequent recommendations for projects as appropriate (update Fall 2016, interim report Fall 2017; final report Winter 2018).

- C. **Explain how you determined your cost estimates.**

Planning and Combination (Planning and Acquisition) Project Proposal ~~July 17, 2015~~ ~~July 15, 2015~~ ~~July 13, 2015~~

Salaries	Activity/Item	Unit	Unit cost	Total
Research Scientist 1	Tagging, Analysis, Reporting	2.5	5668	14,170
Scientific Technician 3	Late Summer/Early Fall electrofishing/tagging	4	3631	14,524
Scientific Technician 2	Late Summer/Early Fall electrofishing/tagging	4	3135	12,540
Scientific Technician 2	Late Summer/Early Fall electrofishing/tagging	4	3135	12,540
Salaries subtotal:		14.5		53,774
Benefits				
State OASI and Retirement	(14.86% of salaries)			7,991
Labor and Industries	(\$141.34/month)			2049.4
Health and Industrial Insurance	(\$800/month - Rep)			11,600
Benefit subtotal:				21,640
Personnel subtotal:				75,414
Goods and Services				
Personnel service overhead	(0.4058% of salaries)			218.21
HRMS Fee	(\$20/month)			290
Travel	Per diem	10	129	1290
Steelhead scale processing		6000	2	12000
PIT tags		9,000	2.67	24,030
G & S and Travel subtotal:				37,828
Subtotal				113,242
Indirect (waived for RCO)	*RCO may allow up to 10% indirect			0
Total (SRFB Request)				113,242
Match				
Maintenance and Monitoring of Lower Snake Compensation Program and BPA				45000
Total Project Cost				158,242

D. How have lessons learned from completed projects or monitoring studies informed your project?

We have completed two years of fieldwork and one year of analysis for the project, which were funded by the McNary Mitigation Fund. We have refined our approach and developed the analytical framework such that we are confident the study and analysis outlined above will be successful. We hope that this study becomes one of the reference points mentioned in the above question 'D' as we seek to identify population-scale needs. Over time, these same data can be used to evaluate population-scale or reach-scale effectiveness of suites of projects.

6. If your project includes an assessment or inventory

A. Describe any previous or ongoing assessment or inventory work in your project's geographic area and how this project will build upon, rather than duplicate, the completed work.

Two years of similar work has just been conducted. Results are already available from 2013 work that only targeted spring Chinook salmon. Notable findings included very low (~12%) overwintering survival and fairly extensive use of the middle Tucannon River (i.e., downstream of the UTR PIT tag detection site) after the fall migration. The 2014 work expanded to include steelhead, but analysis has not yet been conducted. Because this SRFB-funded work would not begin until 2016 and fish wouldn't emigrate until 2017 (Chinook and steelhead) or 2018 (steelhead), we will have ample time to refine our analytical approach prior to implementing the project in 2016. We are still seeking funding to execute this project in 2015.

7. If your project includes developing a design:

**A. Will your project be designed by a licensed professional engineer?
Choose an answer**

- i. **If not, please describe the qualifications of your design team.**

8. Will you apply for permits as part of this project's scope?

No

A. If not, please explain why and when you will submit permits.

Permits are already in hand.

9. If your project includes a fish passage or screening design:

- A. Has your project received a Priority Index (PI) or Screening Priority Index (SPI) number? If so, provide the PI or SPI number and describe how it was generated. (i.e. *physical survey, reduced sample full survey, expanded threshold determination, or Washington Department of Fish and Wildlife generated. Refer to the Washington Department of Fish and Wildlife's "Fish Passage Barrier and Surface Water Screening Assessment and Prioritization Manual" at: <http://wdfw.wa.gov/publications/pub.php?id=00061> for guidance.*)

B. For fish passage design projects:

- i. **If you are proposing a culvert or arch, will you use stream simulation, no slop, hydrologic, or other design method? Please describe.**
- ii. **Describe the amount and quality of habitat made accessible if the barrier is corrected.**

- iii. **List additional upstream or downstream fish passage barriers, if any.**

10. Context within the Local Recovery Plan.

- A. **Discuss how this project fits within your regional recovery plan and/or local lead entity's strategy to restore or protect salmonid habitat**

This project and projects like it have been strongly supported by regional recovery entities in recent years as the concept of using fish to identify population bottlenecks and prioritize management actions has gained traction. This project seeks to directly inform local planning processes regarding the most beneficial locations and types of projects to improve survival and/or capacity of ESA-listed spring Chinook salmon and steelhead.

- B. **Explain why it is important to do this project now instead of later.**

Spring Chinook salmon and steelhead in the Tucannon River have declined to very low abundance and viability despite ongoing aggressive restoration and other types of intervention (e.g., hatcheries). The work proposed here will continue a critical series of data that takes time and replication to be useful for management purposes. The target species are in need.

- C. **If your project is a part of a larger overall project or strategy, describe the goal of the overall strategy, explain individual sequencing steps, and which of these steps is included in this application for funding.**

These data will eventually contribute to the development of full life cycle model as part of the Adaptive Management Implementation Plan (AMIP) that is administered by NOAA Fisheries. At that point the Tucannon model(s) would join other regional models and management action scenarios will be tested for population response. For example, alterations to hydropower operations, hatcheries, or predation by pinnipeds are among the threats that are included in current models. This project is solely focuses on analysis of survival and habitat utilization within the Tucannon and to Lower Monumental Dam; these other elements are only mentioned as another future use of the same data.

11. Project Proponents and Partners.

- A. **Describe your experience managing this type of project.**

If funded, this will be the 3rd or 4th year of executing this project in the Tucannon (pending 2015 project funding). The results from the first year's work were promising. Additionally, we are pursuing similar efforts throughout the interior Columbia River, especially in places like the Wenatchee and Methow Rivers where extensive PIT detection infrastructure exists. Remote parr tagging is conducted in multiple tributaries of each of these rivers. The analytical portion of this project was developed in the Wind River and the model was adapted to Tucannon spring

Chinook salmon. By the end of 2015 it will have been further modified to describe steelhead survival and movement, which is far more complex.

B. List all landowner names.

This project occurs throughout the Tucannon River and utilizes access points that are established survey entry or exits for WDFW on a variety of survey types.

C. List project partners and their roles and contributions to the project.

Attach a Partner Contribution Form (Manual 18, Appendix G) from each partner in PRISM. Refer to Manual 18, Section 3 for when this is required.

Our primary partners are Brain Mahoney and Rey Weldert (CTUIR) who may contribute to the execution of the project in the future, improvement of the PIT tag detection infrastructure, or to other aspects. They are also a habitat restoration implementer that could utilize the findings of this study. We are also partnered with NOAA Fisheries and other entities as part of the AMIP life cycle modeling group.

D. Stakeholder Outreach. *Discuss whether this project has any opposition or barriers to completion besides funding. Describe your public outreach and feedback you have received. Are there any public safety concerns with the project? How will you address those concerns?*

~~Not a concern at this time.~~[We have communicated with the other Co-Managers in the region on the project – based upon this communication we have added a task 1 to the scope of work.](#)

Comments

Use this section to respond to the comments you will receive after your initial site visits and after you submit your final application.

Response to Site Visit Comments

Please describe how you've responded to the review panel's initial site visit comments. We recommend that you list each of the review panel's comments and questions and identify how you have responded. You also may use this space to respond directly to their comments.

Draft Application / Site Visit REVIEW PANEL comments

Date: June 18, 2015

Project Site Visit?

Yes

No Review Panel Member(s): Slocum and Tyler

1. Recommended improvements to make this a technically sound project according to the SRFB's criteria:

If this study will be proposed for funding as a SRFB assessment in the regular grant round, then the application must clearly address each of the "data gap filling" criteria listed on p. 18 of Manual 18 (http://www.rco.wa.gov/documents/manuals&forms/Manual_18.pdf). Compelling justification especially should be provided for the first and third criteria: for the first, how does lack of information on overwintering behavior limit project identification in the Tucannon, when the 2011 geomorphic assessment already identified over twenty habitat restoration projects throughout the lower, middle and upper reaches of the river?

Correct, a geomorphic assessment has been performed for the entire Tucannon River. Based upon that and the understanding at the time of the system as it relates to fish use, conceptual restoration plans were developed with priority given to projects above RM 23.65 – this has affected project development from concept to implementation, project prioritization, and funding. Given preliminary data regarding fish use and movement through the lower Tucannon, project development (limiting factors addressed) and prioritization may need to be reevaluated as our understanding of the system and the relative benefit for critical life history stages. This project embodies adaptive management.

For reaches downstream of geomorphic reach 7 there are numerous potential actions identified although at a fairly coarse level of detail (e.g., habitat complexity, reconnecting floodplain, and riparian restoration are highly prioritized). With additional information about survival and distribution, actions suggested in the assessment could be prioritized and potential new ones identified. Focusing on winter habitat may elevate the priority of projects that are focused on perennial off channel habitat, complexity, and fine sediment reduction.

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Did the 2011 geomorphic assessment identify projects opportunistically, rather than taking a targeted approach based on limiting habitat parameters?

The Conceptual Restoration Plan, based in part upon the geomorphic assessment, identified projects based upon limiting habitat parameters. However, prioritization of projects and some of the conceptual project elements were based upon the current understanding of fish habitat use and timing. ~~assessment likely identified projects based on physical habitat opportunities rather than empirical fish information.~~ Having potential actions identified would be very helpful and fish survival info can be used to update and inform the prioritized ~~the~~ list.

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Would the bottlenecks identified through the life cycle approach be used to prioritize these previously identified projects?

Yes, and potentially identify new ones or elevate the priority of actions that were not highly regarded in the assessment (e.g., fine sediment reduction). Habitat use by life stage and timing information provided by this assessment would also inform project designs as they progress from conceptual to final.

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Likewise, for criteria No. 3, why are SRFB funds necessary for this funding, within the context of the large amount of BPA funding that is dedicated to the Tucannon?

Two years of data have informed this assessment so far, additional funding is needed to provide significance and confidence in this data by continuing the assessment WDFW has attempted to secure BPA support for similar projects throughout the region, but repeatedly we've been told that no "new" money is available. Without redirecting money from other projects, accessing BPA funds is currently impossible for this project. Beginning in 2018 we intend to reallocate some BPA contract funds (allocated to WDFW) to this project.

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Regarding habitat restoration funding provided by BPA in the Tucannon, this study could help provide additional clarity in fish habitat use and movement at critical early life stages which may shift the or expand the focus of restoration actions in the basin. Currently, BPA habitat funding is focused (and in part only eligible) for project implementation above RM 23.65.

Would it make as much sense to simply adopt a policy of more evenly spreading the BPA funding among the projects in each of the geomorphic assessment reaches, rather than focusing them upstream of Morengo?

Yes, this would make a lot of sense, especially considering the extensive use of the middle and lower Tucannon by ESA-listed steelhead and fall Chinook salmon, and the apparently important overwintering habitat for spring Chinook salmon. However, additional information regarding survival across years in the Tucannon would be helpful for identifying actions and comparing the Tucannon to other systems/populations in the Columbia River. The work included in this proposal also offers an opportunity to document action effectiveness at the population scale as numerous actions are completed and potentially affect the distribution, movement, and survival of each juvenile cohort.

The proposal text explains why a study of overwintering behavior would be interesting from a fisheries science perspective, but to qualify for the SRFB funding, it needs to refocus on making a strong argument for each of the Manual 18 data gap criteria.

Table 4-1 of the 2011 assessment identified little to no use of the Tucannon River downstream from Marengo, however from our 2 years of tagging work we have seen extensive emigration of fish to reaches downstream from UTR, which is near Marengo, prior to winter. So, the restoration actions suggested in the assessment may not have taken winter rearing habitat for Chinook into consideration. As mentioned above, the results of this assessment will aid in informing the development of projects from concept to final design below RM23.65, future project prioritization and funding options/availability.

2. Missing Pre-application information:

IF CTUIR will be a partner on this project, a partner form must be included in the final application.

We will include this form.

3. General Comments:

This project may be submitted as both a regular grant round project and as a regional monitoring request. The data gap criteria identified in point 1 applies only to the regular grant round application and not to regional monitoring applications. Note that to submit this project for consideration under both the monitoring and the project application approaches, two applications will be required by August 14: the current Planning and Combination Project Proposal, and the Regional Monitoring Proposal (available for download at <http://www.rco.wa.gov/documents/manuals&forms/RegionalMonitoringProposal.docx>).

Thank you. We have been discussing these options with SRSRB staff for quite some time. We will consider applying to both programs.

4. Staff Comments:

Please be sure to address all comments I provided when I reviewed the application in May/June (if you haven't already done so), along with completing all other final application requirements listed in Section 3 of RCO Manual 18 http://www.rco.wa.gov/documents/manuals&forms/Manual_18.pdf. All changes to your proposal should be made using "Track Changes" in Word.

Done.

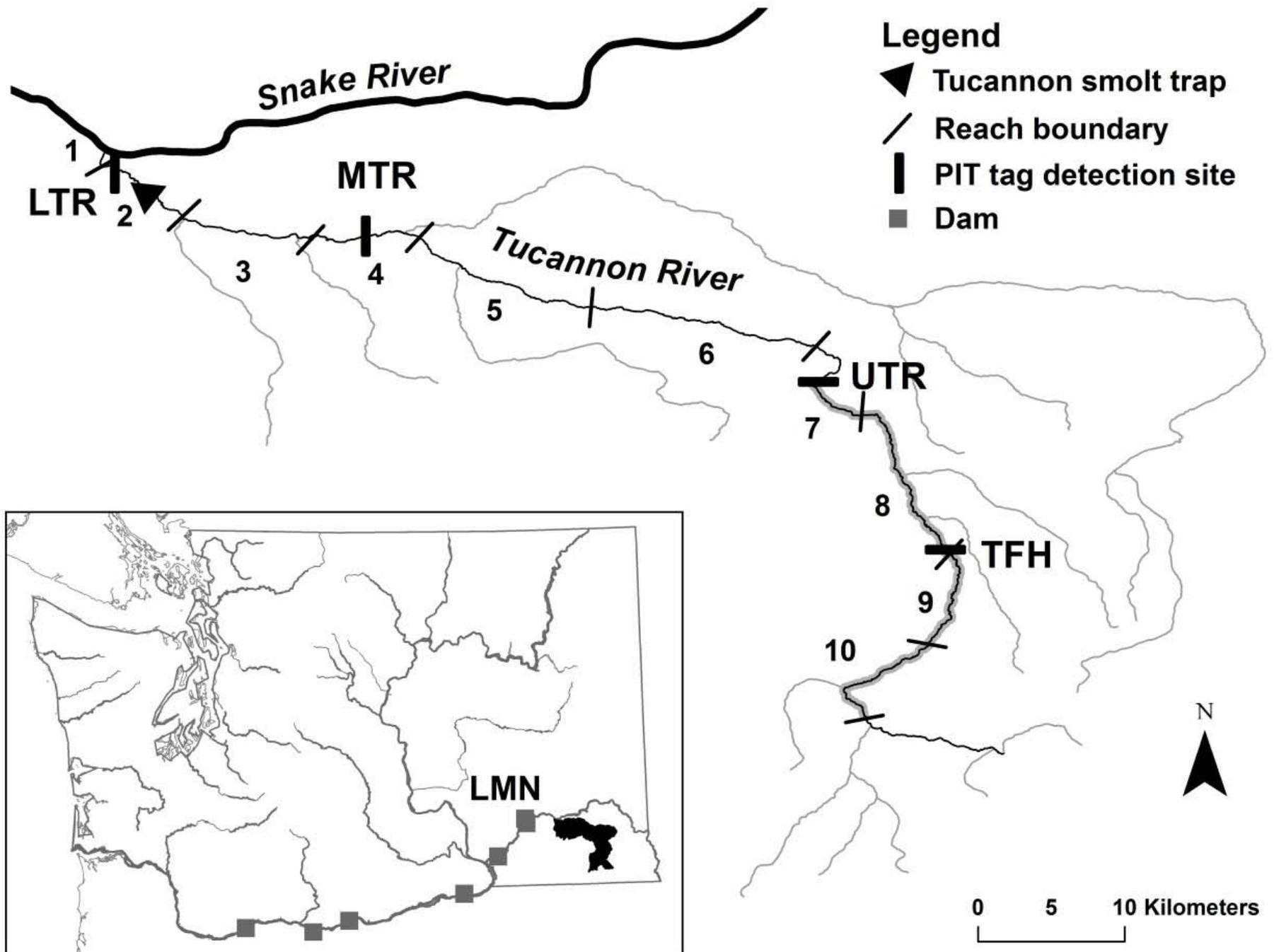


Sponsor Response instructions:

Revise your project proposals using "track changes" and update any relevant PRISM questions and attachments. Fill out the section at the end of your project proposal to document how you responded to comments.

Response to Post-Application Comments

Please describe how you've responded to the review panel's post-application comments. *We recommend that you list each of the review panel's comments and questions and identify how you have responded. You also may use this space to respond directly to their comments.*







Salaries	Activity/Item	Unit	Unit cost	Total
Research Scientist 1	Tagging, Analysis, Reporting	1.5	5668	8,502
Scientific Technician 3	Late Summer/Early Fall electrofishing/tagging	2	3631	7,262
Scientific Technician 2	Late Summer/Early Fall electrofishing/tagging	2	3135	6,270
Scientific Technician 2	Late Summer/Early Fall electrofishing/tagging	2	3135	6,270
Salaries subtotal:		7		28,304
Benefits				
State OASI and Retirement	(14.86% of salaries)			3,920
Labor and Industries	(\$141.34/month)			989
Health and Industrial Insurance	(\$800/month - Rep)			5,843
Benefit subtotal:				10,752
Personnel subtotal:				39,056
Goods and Services				
Personnel service overhead	(0.4058% of salaries)			83
HRMS Fee	(\$20/month)			110
Travel	Per diem	10	129	1290
Steelhead scale processing		3000	2	6000
PIT tags		4,500	2.67	12,015
G & S and Travel subtotal:				19,498
Subtotal				58,554
Indirect (29% of subtotal)				16,981
Total (Contract Amount)				75,535