

Lower Wenatchee and Peshastin Thermal Refuge Assessment

Chelan County Natural Resources Department

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Wenatchee, WA 98801

Prism # : 23-1287 PLAN

Anticipated SRFB Request: \$82,968

Anticipated Trib Comm Request: \$0

Other Match: \$32,836

Anticipated TOTAL Project Budget: \$115,804



Thursday, May 18, 2023

2023 Regional Project Pre-application

2023 Upper Columbia Regional Project Pre-Application

- * Pre-applications due March 10, 2023 (COB)
- * Complete applications due in PRISM April 20, 2023 (COB)
- * Revised proposals due in PRISM May 19, 2023 (COB)
- * Final revised applications due in PRISM June 26, 2023 (noon)

Project Title

Lower Wenatchee and Peshastin Thermal Refuge Assessment

Contact Information

Sponsor

Chelan County Natural Resources Department

Primary Contact

Adrienne Roumasset

E-Mail Address

adrienne@blueheronhealth.org

Budget Request

Anticipated Request - SRFB (standard round)

82,968

Anticipated Request - Tributary Committee

0

Anticipated Request - BPA Programmatic

0

Anticipated Other Funding

32,836

Anticipated TOTAL Budget

115,804

Other Funding Source(s)

Washington Department of Ecology

Project Location

Briefly describe the location of the project

The Assessment will occur in the Wenatchee River from RM 26.5 to RM 0, and in Peshastin Creek from RM 16 to RM 0

Latitude (decimal degrees)

47.55598

Longitude (decimal degrees)

120.5735

Project subbasin

Wenatchee

Wenatchee Assessment Unit(s)

Wenatchee River-Derby Canyon

Reach(es) Name

Wenatchee River reaches: Tumwater 1, Derby 1-6, Ollala 1 - 3, Nahahum 1 - 7. Lower Peshastin reaches 8 - 1

Identify the reach(es) priority/ reach ranking. Note: If the project involves work in multiple reaches, select "Multiple" and include details in the text box that will appear below. Please reference the Prioritization Web Map: <https://prioritization.ucsrb.org/>.

Multiple reaches (provide details below)

Please detail the reach-ranking of the reaches below

Rank 1 reaches = Tumwater 1; Derby 2 and 3; Ollala 2; Nahahum 7, 6, and 1; Lower Peshastin 8, 2 and 1
Rank 2 reaches = Derby 4 and 1; Ollala 3; Nahahum 2 and 5; Lower Peshastin 5, 4 and 3
Rank 3 reaches = Derby 6 and 5; Ollala 1, Nahahum 4 and 3; Lower Peshastin 7 and 6

Project Information

1. What are the project objectives? Objectives support and refine biological goals, breaking them down into small steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). Note: This exact question is included in the PRISM application. Example format: The project seeks to address [specify limiting factor(s)] for [limiting life stage(s)] by [specific actions proposed] to create an estimated [include specific target metrics, as described below] upon implementation in [estimated year].

This project will address the Tier 1 data gap "Location and characteristics of thermal refuge areas" in Peshastin creek RM 0 -16 and Lower Wenatchee River RM 0 - 26.5, by collecting continuous longitudinal temperature data and conducting cold-spot checking of tributary mouths, off-channel habitat, and cold areas indicated in 2003 and 2001 Forward Looking Thermal Infared (FLIR) data.

1. Address the tier 1 data gap, "Location and characteristics of thermal refuge areas" in a total of 42.5

river miles of steelhead MaSAs with unacceptable rearing temperatures (Lower Wenatchee 0 - 26.5 and Peshastin creek 0 - 16), by mapping and characterizing thermal refuge during the hottest time of the year in 2024 and 2025. Cold-water areas that meet temperature differential criteria of at least 0.5 degrees Celsius will be measured and mapped, displaying location, plume size, and habitat quality.

2. Collect continuous, fine-scale thermal data via ground-based methods (summer 2024/25) in 80 percent of the lower Peshastin and lower Wenatchee in order to assist in thermal refuge identification and to contextualize refuge location within the fine-scale thermal heterogeneous riverscape.

3. Collect summer drone-based FLIR on at least 5 of the 7 RMs of the upper Peshastin not feasible for ground methods (summer 2024/25) and winter drone-based FLIR on at least 5 RMs in the lower Wenatchee to identify both summer and winter thermal refuge.

4. Identify site-specific restoration projects to augment winter and summer thermal refuge areas, including projects that expand cold water plumes, reconnect off-channel refuge to mainstem habitat, and/or improve habitat quality (e.g. by providing woody cover), by October 2025.

5. Facilitate high data visibility and ease of use by disseminating in a variety of formats, including 1. at collaborative meetings 2. in a written Assessment report 3. via an interactive online data portal and 4. in downloadable shapefiles available on the UCSRB website, by January 2026.

2. What species will the project benefit?

Spring Chinook

Steelhead

Bull Trout

3. Select the project's objectives and the associated tracking metrics

Design, Monitoring or Assessment

4. Does this project already exist in Salmon Recovery Portal or PRISM?

No

5. Has this project been submitted previously for funding through the SRFB and/or other process(es)?

No

6. What category is the project?

Assessment

Design and Restoration Proposals

Assessment Proposals

7. What type of assessment are you proposing?

A continuous temperature and thermal refuge assessment

8. Is the assessment identified on the MaDMC monitoring and data gaps list?

Yes

9. Describe how the assessment fills a regional priority and where that priority is identified.

The assessment fills a tier one data gap identified in the most recent version (2-9-2023) of the MaDMC Upper Columbia data gaps list, namely "Location and characteristics of thermal refuge areas" in priority restoration reaches.

It will also lead to projects that address a rank 1 limiting factor (rearing temperature) to improve conditions for medium and high priority life-stages (summer and winter rearing) of spring Chinook and steelhead.

10. Methods - What methods will you use in your assessment and how will they achieve your stated objective(s)?

We will use very similar methods that we used in the Upper Wenatchee Thermal Refuge Assessment, with the addition of drone-based FLIR data collected in-house by CCNRD staff:

We will collect ground-based continuous longitudinal temperature profiles during peak summer temperatures in order to characterize spatial heterogeneity within the thermal landscape that occurs during low flow and peak summer temperature conditions. We will also collect summer drone based FLIR in the upper Peshastin (RM 9- 16) where access via ground based methods are not feasible. This will support development of thermal refuge projects by understanding areas of rapid warming, in addition to locating cold-spots that may not be apparent in old FLIR data.

We will also collect winter drone-based FLIR data in at least 5 RMs of select lower Wenatchee reaches to locate ground water seeps that may serve as temperature refuge in winter. Potential reaches for winter FLIR have been selected due to ease of access (feasibility), location of off-channel habitat that may have ground water inputs that provide warm winter refuge, and reach priority (UCSRB 2020).

Lastly, the assessment will include cold-spot checking potential thermal refuge areas (indicated in a data review of FLIR and aerial imagery), and detailed habitat data of each located cold-spot in order to address the tier 1 data gap. Cold-spot checking and associated habitat data will also support development of habitat actions that address priority limiting factors (rearing-temperature, channel complexity, off-channel habitat) for rearing steelhead and spring Chinook in surveyed reaches.

11. Will a design result from the project?

No

13. Briefly describe why SRFB funds are necessary, rather than other sources of funding.

SRFB funding is necessary because this project addresses priorities as identified in the regional Salmon Recovery Plan, Biological Strategy, and prioritization. It addresses a tier 1 data gap, and is data that will be used exclusively to improve water quality and habitat conditions for ESA-listed species.

Protection Proposals

Monitoring Proposals

Project Risk and Economic Benefits

1. What is the landownership?

Public land

2. Have you secured landowner participation in or acceptance for this project?

No

Please explain

We do not need landowner participation to complete this project. We will conduct the project on waterways that are open to and navigable by the public. Access will be primarily public. If

access by private land is preferred for a particular cold spot or longitudinal profiling event, we will reach out to the landowner for permission prior to access.

3. Describe any land owner requirements (e.g., design elements, right-of-ways, access agreements, liability waivers, etc.) and if/how they could affect the project

Landowner participation will not be required, see above.

4. Will the project raise potential concerns for interest groups (e.g., recreational users) or the community at large (including upstream/ downstream/ adjacent landowners)?

No, there are no potential concerns for interest groups or the community. We will use data to raise awareness regarding thermal refuge at community meetings.

5. Who will have the responsibility to manage and maintain the project? What is the responsibility of current or future landowners?

Data will be managed by CCNRD and shapefiles of longitudinal profiles and cold spot locations with related habitat and temperature data will be available on the UCSRB website.

6. Are other projects being proposed immediately upstream or downstream of worksite?

No

7. Please describe the risk of failure associated with this project.

There is no risk of failure of this project, as it leverages on low cost equipment and staff time to complete data collection. The information and data will supplement available information to help sponsors build projects that address and take into account existing, largely unknown, temperature conditions. This synthesis of information and the projects that result will increase ESA-listed species resilience to climate change.

8. Is there any public outreach planned during and/or after implementation? Does the project build community support for salmon recovery efforts?

We will present information at biennial community meetings.

9. Does the project represent an opportunity for economic benefit? How much benefit does the project create for the dollars invested?

The Upper Wenatchee Thermal Refuge Assessment has resulted in the planning and development of two restoration projects whose goal is to increase plume size of two cold spots. These projects will increase fish capacity of these areas, and thus increase fish survival rates (thermal refuge areas have been shown to increase survival when ambient temperatures reach thermal limits of ESA-listed species.) The last assessment resulted in the identification of 41 cold spots, that could potentially become projects in the future, for a subsequent increase in survival. Additionally, easily accessible continuous temperature data (via the assessment and the online portal) has allowed sponsors developing all types of restoration projects to contextualize their project within the thermal landscape, thus avoiding any potential harm to existing thermal refuge areas that may have occurred without the provided context. In addition to their inherent value, Chinook and steelhead provide an economic benefit through subsistence fisheries of tribal communities, and generate tourism and recreational fishing opportunities. Temperature is a critical factor that threatens the survival and sustainability of listed species. Thus, identifying thermal refuge areas, as this project proposes, is a crucial step in creating resilience to climate change, helping to ensure ESA-listed species persistence into the future, and providing the associated economic benefit that salmon in the Upper Columbia represent.

10. Describe any partnerships, their experience, and types of contributions supporting the project.

The Washington Department of Ecology has committed funding to complete the assessment in Peshastin creek. UCSRB has voiced support of this project.

Optional Section - Preparation for PRISM

Do you want to review and/or pre-populate PRISM questions?

No

Supporting Documents

Upper Columbia Process Guide 2022 (updates anticipated January 2023)
SRFB Manual 18 (2023)
RCO Application Resources (2023)

Does the proposed project span multiple assessment units?

Yes

List the additional assessment units directly impacted by this proposal.

Wenatchee River - Ollala Canyon, Wenatchee River - Nahuhum Canyon, Wenatchee River - Tumwater Canyon, Lower Peshastin, Upper Peshastin

PROJECT: 23-1287 PLAN, LOWER WEN. AND PESHASTIN THERMAL REF. ASSESSMENT

Sponsor: Chelan Co Natural Resource Program: Salmon State Supplemental Sm Status: Active

Parties to the Agreement

PRIMARY SPONSOR

Chelan County Natural Resources Department

Address 411 Washington St Ste 201

City Wenatchee **State** WA **Zip** 98801

Org Type County-Open Space/Nat Resources

Vendor # SWV0001231-12

UBI

Date Org created

Org Notes

[link to Organization profile](#)

Org data updated

SECONDARY SPONSORS

No records to display

MANAGING AGENCY

Recreation and Conservation Office

LEAD ENTITY

Upper Columbia Salmon Rcy Bd L

QUESTIONS

#1: List project partners and their role and contribution to the project.

External Systems

SPONSOR ASSIGNED INFO

Sponsor-Assigned Project Number

Sponsor-Assigned Regions

EXTERNAL SYSTEM REFERENCE

Source	Project Number	Submitter
HWS	23-1287	DHecker

Project Application Report - 23-1287

Project Contacts

Contact Name Primary Org	Project Role	Work Phone	Work Email
<u>Amee Bahr</u> Rec. and Conserv. Office	Project Manager	(360) 867-8585	Amee.Bahr@rco.wa.gov
<u>Doran Lower</u> Rec. and Conserv. Office	MAgy Fiscal Contact	(360) 902-3007	doran.lower@rco.wa.gov
<u>Matt Holland</u> Chelan Co Natural Resource	Project Contact	(509) 679-0085	matt.holland@co.chelan.wa.us
<u>Adrienne Roumasset</u> Chelan Co Natural Resource	Alt Project Contact	(509) 667-6436	adrienne@blueheronhealth.org
<u>David Hecker</u>	Lead Entity Contact	(208) 869-9446	dave.hecker@ucsr.org
<u>Sofia Bjorklund</u> Chelan Co Natural Resource	Billing	(509) 667-6324	sofia.bjorklund@co.chelan.wa.us

Worksites & Properties

Worksite Name

#1 Peshastin Creek RM 0 - 16

Planning

Property Name

#2 Lower Wenatchee River RM 0 - 25.6

Planning

Property Name

Worksite Map & Description

Worksite #1: Peshastin Creek RM 0 - 16

WORKSITE ADDRESS

Street Address

City, State, Zip Peshastin WA 98847

Worksite #2: Lower Wenatchee River RM 0 - 25.6

WORKSITE ADDRESS

Street Address

City, State, Zip Cashmere WA 98815

Worksite Details

Worksite #1: Peshastin Creek RM 0 - 16

SITE ACCESS DIRECTIONS

The lower 16 miles of Peshastin Creek follow US route 97 from its junction with US route 2 roughly a mile southeast of the town of Peshastin, to roughly 14 miles south on 97.

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TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Steelhead-Upper Columbia River, Wenatchee River, Threatened	✓	✓	✓	Declining
Chinook-Upper Columbia River Spring, Wenatchee River, Endangered	✓	✓	✓	Declining

Reference or source used

UCSRB Prioritization webmap at <https://prioritization.ucsrborg/>, and NOAA's 2022 5-year Review: Summary and Evaluation of Upper Columbia River Spring-tun Chinook Salmon and Upper Columbia River Steelhead

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Bull Trout	Foraging, Migrating, and Overwintering Bull trout are present.

Questions

#1: Give street address or road name and mile post for this worksite if available.

US Route 97, milepost 184 to 170.

Worksite #2: Lower Wenatchee River RM 0 - 25.6

SITE ACCESS DIRECTIONS

The lower 25.6 miles of the Wenatchee River follow US Route 2 from Leavenworth to Confluence Park in Wenatchee.

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Chinook-Upper Columbia River Spring, Wenatchee River, Endangered	✓	✓	✓	Declining
Steelhead-Upper Columbia River, Wenatchee River, Threatened	✓	✓	✓	Declining

Reference or source used

UCSRB Prioritization webmap at <https://prioritization.ucsrborg/>, and NOAA's 2022 5-year Review: Summary and Evaluation of Upper Columbia River Spring-tun Chinook Salmon and Upper Columbia River Steelhead

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Bull Trout	Foraging, Migrating, and Overwintering Bull trout are present.

Questions

#1: Give street address or road name and mile post for this worksite if available.

US Route 2, milepost 100 to 119

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Project Location

RELATED PROJECTS

Projects in PRISM

PRISM Number	Project Name	Program Name	Current Status	Relationship Type	Notes
17-1241 P	Thermal Refuge Assessment in Wenatchee & Entiat	Salmon State Projects	Closed Completed	Earlier Phase	This closed project included the Upper Wenatchee Thermal Refuge Assessment. The proposed project will extend this work to the Lower Wenatchee River and Peshastin Creek.

Projects not in PRISM

Project Number	Project Name	Current Status	Relationship Type	Project Funder
WQC-20240C	Addressing the temperature	Proposed	Current Phase	Washington Department of Ecology

Related Project Notes

Addressing the temperature TMDL in Peshastin is on Washington Department of Ecology's funding list but is not yet under contract. This grant covers the majority of the proposed work in Peshastin and will provide match for the proposed project.

Questions

#1: Project location. Describe the geographic location, water bodies or habitat types, and the location of the project in the watershed, i.e. nearshore, tributary, main-stem, off-channel, etc.

This planning project will occur in WRIA 45, Wenatchee watershed. It will include collection of temperature data within the main-stem Wenatchee river (RM 0 - 26.5) and within the main-stem Peshastin Creek (RM 0 - 16) which is a tributary of the Wenatchee River.

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#2: How does this project fit within your regional recovery plan and/or local lead entity's strategy to restore or protect salmonid habitat? Cite section and page number.

The Monitoring and Data Management Committee (MaDMC) of the Regional Technical Team (RTT) provides yearly updates to the Upper Columbia (UC) region Data Gaps list. Filling these data gaps is part of the overall regional salmon recovery plan. This project will address the following Tier 1, habitat data gap identified on the February 2023 list: "Location and characteristics of thermal refuge areas," in Peshastin creek and Lower Wenatchee River. The Data Gaps list is available for upload in excel format at <https://www.ucsr.org/mdocs-posts/madmc-data-gaps/>. The Data Gap ID for the data gap referenced above is 2.18, and is under the Sub-Category Habitat and Topic Thermal Refuge.

The Biological Strategy to Protect and Restore Salmonid Habitat in the Upper Columbia Region (RTT 2017) includes a Prioritization Web Map and Master Prioritization Table that includes the most recent Prioritization updates (UCSRB 2020). Based on these products, temperature is a rank 1, "unacceptable" limiting factor in all project reaches, which will be addressed as detailed in this application. This can be referenced at <https://prioritization.ucsr.org/>, by zooming into and clicking each reach included in the project area detailed above.

Lastly, the main deliverable of this Planning proposal, which is a detailed Lower Wenatchee and Peshastin Thermal Refuge Assessment, will include recommended habitat actions that will lead to priority action recommendations included in the Prioritization. Assessment habitat actions will focus on increasing the fish capacity of cold water (e.g. with a deflector jam to expand cold water plume), improving access to warm winter/cold summer water (e.g. by reconnecting a ground water fed side channel), or improving habitat quality of the warm/cool refuge (e.g. by improving woody cover of an existing ground water seep). Sponsors have also used information from the Upper Wenatchee Thermal Refuge Assessment to target warming reaches for Riparian planting. Therefore, the proposed Assessment will help address the following priority action categories listed in the 2020 Prioritization Table:

Lower Wenatchee (reaches Tumwater 1, Derby 1-6, Nahahum 1-7, Ollala 1-3, Tumwater 1) and Lower Peshastin reaches 1-8: Channel Complexity Restoration, Riparian Restoration, Side Channel and Off-channel habitat restoration, water quality improvement.

Table available at <https://www.ucsr.org/science-resources/prioritization/products/>, Restoration_Results tab

#3: Is this project part of a larger overall project?

Yes

#3a: How does this project fit into the sequencing of the larger project?

This project is part of an Upper Columbia regional effort to fill the Tier 1 Data Gap "Location and characteristics of thermal refuge areas". The first phase of this effort included the 2020 Upper Wenatchee Thermal Refuge Assessment, which was funded by RCO salmon recovery funding in 2018 (Project Number: 17-1241 P, Assessment attached to that project page). The second phase was completed by the Methow Salmon Recovery Foundation in 2022, and involved spot checking cold water patches in the Methow River subbasin. The proposed project would continue this effort and expand it to the Lower Wenatchee River and Peshastin creek.

#4: Is the project on State Owned Aquatic Lands? Please contact the Washington State Department of Natural Resources to make a determination. [Aquatic Districts and Managers](#)

Yes

Surveys will occur on Wenatchee River and Peshastin Creek which are state owned aquatic lands.

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Property Details

Properties for this program and project type are optional.

Project Proposal

Project Description

The proposed Lower Wenatchee River and Peshastin Creek Thermal Refuge Assessment will result in the identification, mapping, and characterization of thermal refuge areas within Lower Wenatchee river miles (RMs) 0 - 26.5, and Peshastin creek RMs 0 -16. The assessment will identify habitat actions to protect, expand, and/or improve functionality of identified refuge areas, to increase ESA-listed steelhead, spring Chinook, and bull trout survival and persistence in the face of warming temperatures due to climate change. This work is an expansion of the well-received Upper Wenatchee Thermal Refuge Assessment, completed in 2020.

The assessment will address a Tier 1 data gap regarding the location and characteristics of thermal refuge areas by collecting continuous temperature data on the microhabitat scale (~3 meters) and spot-checking cold areas indicated in 2001-2003 Forward-Looking Infrared (FLIR) imagery. The project will include collection of drone-based FLIR imagery on select reaches. Detailed habitat data will be collected on located cold patches (or warm winter patches), including relative temperature, plume size, and habitat quality. This information will be used to develop habitat actions.

Information will be made available through several formats - including a written Assessment with detailed data Appendices, downloadable shapefiles, and an interactive map portal - to support restoration actions that will retain benefits in a changing climate.

Project Questions

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#1: Problem statement. What are the problems your project seeks to address? Include the source and scale of each problem. Describe the site, reach, and watershed conditions. Describe how those conditions impact salmon populations. Include current and historic factors important to understand the problems.

Summer maximum stream temperature has been clearly implicated as both a prime factor in the decline and a critical barrier to recovery of pacific salmonids (McCullough et al. 2009, Wondzell et al 2019). Juvenile salmonids exposed to water temperatures of 22.8 have shown a negative growth rate and significant mortality (McCullough 1999). The project reaches, which include Peshastin Creek RM 0-16 and the Wenatchee river 0-26.5, regularly exceed this thermal limit, thereby impeding survival of the ESA-listed steelhead and chinook that use the habitat for summer. Specifically, gage data shows late July to mid-August stream temperatures in 2019 through 2022 ranged from 20 to 25°C in both reaches (Peshastin Creek at Green Bridge WA Ecology, Wenatchee at Monitor USGS). Based on this same gage data, winter water temperatures in the same years reached 0°C, sometimes for an extended period of time, which is below minimum thermal limits that can cause mortality to rearing salmonids (Myrick and Cech 2004).

Movement into thermal refuge areas when ambient water temperature exceeds thermal limits is an adaptive strategy that has been shown to significantly increase survival of pacific salmonids (Rallsback 2023). However, the location and characteristics of the thermal refuge areas in project reaches is currently unknown. Addressing this Tier 1 data gap is a crucial step in ensuring future habitat restoration projects provide benefits to ESA-listed species recovery, especially in the context of anticipated increases in water temperature under climate change. Without this information, future restoration efforts could be misguided and even potentially cause harm to these critical areas. US Highway 97 parallels Peshastin creek for most of its length and has straightened meander bends, reduced total channel length by 0.8 miles, and forced abandonment of 34% of floodplain (Andonaegui 2001). Agriculture and development in the lower watershed have significantly reduced riparian vegetation, resulting in a loss of shade and channel widening that has increased temperatures. Irrigation diversions at Peshastin RM 4.8 and 2.4 withdrawal up to 48 cfs, resulting in chronically low flows that further exacerbate temperature in these lower reaches.

The lower Wenatchee River has been dramatically degraded from historic conditions due to the construction of US Highway 2, widespread development in the floodplain including agriculture, industrial, residential and flood control measures, and stream diversions and well withdrawals. These factors have reduced stream shade, dramatically decreased channel complexity, disconnected the floodplain, and resulted in low summer stream flows.

According to the most recent Upper Columbia Salmon Recovery Habitat Prioritization, rearing temperatures are unacceptable, rank 1 limiting factors throughout the project reaches. This effects spring Chinook and steelhead juveniles, and natal rearing bull trout who are present in Peshastin creek and the lower Wenatchee in the winter and summer seasons. Anthropogenic effects described above have altered stream temperatures by reducing stream shade, restricting floodplain connection, reducing channel complexity, and causing chronic low flows due to surface and ground water withdrawals. Reduced stream shade and low stream flows increase the amount (shade) and effect (flow) of solar radiation, thereby increasing stream temperature. Restricted floodplain connection reduces groundwater-surface water interaction, and reduced channel complexity results in a reduction in hyporheic flow. Both groundwater and hyporheic flow moderate stream temperatures by being a relatively cool input in summer, and a warm input in winter. Therefore floodplain disconnection and reduced channel complexity are a factor in extreme low temperatures as well as summer highs. Thermal refuge areas that exist must be located so that ESA-species can subsist in these current and changing climactic conditions.

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#2: Describe the limiting factors, and/or ecological concerns, and limiting life stages (by fish species) that your project expects to address.

The Monitoring and Data Management Committee (MaDMC) of the Regional Technical Team (RTT) provide yearly updates to the Upper Columbia (UC) region Data Gaps list. This project will address the following Tier 1, habitat data gap identified on the February 2023 list: "Location and characteristics of thermal refuge areas" in Peshastin creek and Lower Wenatchee River. The data gap will be met by collecting continuous temperature data and spot checking FLIR indicated thermal anomalies in Peshastin creek RM 0 – 16 and lower Wenatchee River RM 0 – 26.5.

The 2020 Upper Columbia Salmon Recovery Prioritization for habitat actions within the UC rates temperature as a rank 1 "unacceptable" limiting factor in all project reaches, which includes:

- Upper Peshastin reaches 9-1 (RM 16 – 9) and Lower Peshastin reaches 8-1 (RM 9-0).
- All lower Wenatchee reaches, including Tumwater 1 (RM 26.5-25.3), Derby reaches 6 -1 (RM 25.3 – 16.5), Ollala reaches 3 -1 (RM 16.5 – 10.0) and Nahahum reaches 7 – 1 (RM10- 0).

Unacceptable temperature in lower Peshastin reaches effects medium priority life stages including spring Chinook summer rearing and steelhead winter rearing juveniles. Unacceptable temperature in upper Peshastin reaches effects high priority natal rearing bull trout and medium priority winter rearing steelhead. This assessment will lead to projects that address the following high priority actions throughout lower and upper Peshastin creek: improve water quality (temperature), off-channel restoration, and channel complexity projects.

Unacceptable temperature in all lower Wenatchee project reaches effects medium and high priority life stages including winter rearing steelhead and spring Chinook (both high priority), and summer rearing steelhead (medium priority). This assessment will lead to projects that improve water quality (temperature), and off-channel restoration, which are listed as high priority actions throughout lower Wenatchee river.

Since this Assessment covers a total of 34 reaches in 6 Assessment units (AUs), reach ranks vary. However, all AUs (except the upper Peshastin, where reaches are unranked) have at least one high priority reach. This project will also occur in several high tiered Assessment Units, as follows:

Tier 1: Steelhead - Tumwater, Deby, Ollala; Bull Trout - Upper Peshastin

Tier 2: Steelhead - Upper and Lower Peshastin; Bull Trout - Tumwater, Derby, and Ollala ;

spring Chinook - Upper and Lower Peshastin, Tumwater and Derby

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#3: What are the project goals? The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired future condition. Include which species and life stages will benefit from the outcome, and the time of year the benefits will be realized. **Example Goals and Objectives**

1. Identify, map, and characterize thermal refuge within steelhead MASAs with known summer and winter temperature limitations, including lower Wenatchee and Peshastin creek.
2. Identify habitat actions to protect, expand, or improve functionality of identified thermal refuge areas to ultimately increase steelhead and spring Chinook juvenile rearing and bull trout natal rearing survival.
3. Provide an accessible data set, to help sponsors build projects that consider temperature, aka the "master variable" of freshwater habitat and cold-water fish survival, by incorporating thermal refuge location, refuge density, and fine-scale thermal heterogeneity in all restoration planning and implementation activities.

#4: What are the project objectives? Objectives support and refine biological goals, breaking them down into smaller steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). **Example Goals and Objectives**

1. Map and characterize thermal refuge in 42.5 river miles of steelhead MaSAs with unacceptable rearing temperatures (Lower Wenatchee 0 - 26.5 and Peshastin creek 0 - 16) during the hottest time of the year in 2024 and 2025. Cold-water areas that meet temperature differential criteria of at least 0.5 deg Celsius will be measured and mapped, displaying location, plume size, and habitat quality.
2. Collect continuous, fine-scale (< 3 meters) thermal data via ground-based methods (summer 2024/25) in 80 percent of the lower Peshastin and lower Wenatchee in order to assist in thermal refuge identification and to contextualize refuge location within the thermal heterogeneous riverscape.
3. Collect summer (2024/2025) drone-based FLIR on at least 5 RMs of the upper Peshastin not feasible for ground methods and winter (24/25) drone-based FLIR on at least 5 RMs in the lower Wenatchee (Table 1) to identify both summer and winter thermal refuge.
4. Identify site-specific restoration projects to augment winter and summer thermal refuge areas, including projects that expand cold water plumes, reconnect off-channel refuge to mainstem habitat, and/or improve habitat quality (e.g. by providing woody cover), by October 2025.
5. Facilitate high data visibility and ease of use by disseminating in a variety of formats, including 1. at collaborative meetings 2. in a written Assessment report 3. via an interactive online data portal and 4. in downloadable shapefiles available on the UCSRB website, by January 2026.

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#5: Scope of work and deliverables. Provide a detailed description of each project task/element. With each task/element, identify who will be responsible for each, what the deliverables will be, and the schedule for completion.

Task 1. Data review and potential cold spot identification.

The contracted Project Scientist (PS) will conduct data review to help identify thermal refuge areas and focus longitudinal temperature profiling efforts. Ecology 2001-2003 FLIR imagery, topographic data and LiDAR will be closely reviewed to identify potential warm winter and cool summer spots associated with habitat features such as tributary mouths, springs, off channel habitats and wetlands, beaver complexes, meander bends, orchard drains, and side-channels. NOAA scientists' Spatial Stream Temperature Model (SSNs) will also be reviewed to provide a context for spot-checking and help inform areas to focus longitudinal profiling. This dataset will be available for use in late 2023 (Aimee Fullerton, NOAA, personal communication).
Deliverable: List of Potential Cold Spots, 6/2024

Task 2. Microhabitat scale sampling (spot-checking)

During summer months, the PS and a CCNRD Field Technician (Field tech) will use a fast-response thermal probe with digital readout to ground-truth the list of potential cold-spots identified in Task 1. If the location is at least 0.5°C cooler than ambient temperatures, the spot will be photographed and the following habitat data collected: temperature, depth, channel unit type, plume extent, fish cover, GPS location (Fig 1). This task will also include winter, warm-spot checking based on warm spots indicated in winter drone-based FLIR flights. Deliverable:

Georeferenced and characterized thermal refuge areas; 1/26

Task 3. Ground-based and drone-based FLIR longitudinal temperature profiles

The PS and Field tech will conduct ground-based profiles when stream temperatures are at or near their early peak. Data will be georeferenced, corrected for temporal temp variability, and entail dragging a quick response temperature logger through the thalweg, (Figure 2). Two staff will float the Wenatchee simultaneously due to wide-channel width. The CCNRD Monitoring Specialist will perform drone-based FLIR profiles on at least 10 RMs, including 5 RMs of summer FLIR on the upper Peshastin, and 5 RMs of late fall/early winter FLIR in the lower Wenatchee (see Table 1 for reach specifics). Deliverable: Continuous ground-based temperature profiles on 80% of project reaches, at least 5 RMs of summer and 5 RMs of winter FLIR; 1/2026

Task 4. Assessment development and data dissemination

The PS will prepare a written assessment that details data collected and recommended habitat actions across the study area. This will closely resemble the Upper Wenatchee Thermal Refuge Assessment (attached), with the addition of winter data. Data will also be added to the current online portal: https://fishsciences.shinyapps.io/ChelanCountyNRD_ThermalRefugeMap/. Shapefiles will be made available on UCSRBs website. Assessment progress and results will be presented at a number of public and salmon recovery community meetings. Deliverable: Assessment, online portal, shapefiles, 2 meetings; 1/2026

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- #6: What are the assumptions and physical constraints that could impact whether you achieve your objectives? Assumptions and constraints are external conditions that are not under the direct control of the project, but directly impact the outcome of the project. These may include ecological and geomorphic factors, land use constraints, public acceptance of the project, delays, or other factors. How will you address these issues if they arise?

Potential constraints and ways we will address them are listed below.

River Access: River reaches are paralleled by highways and/or public roads for almost their entire length, which presents multiple access opportunities. Access to potential cold spots and for ground-based profiles will be from public areas, except in cases where CCNRD has an active, working relationship with landowners, which is the case in several project reaches where restoration work is ongoing or proposed (i.e. Peshastin side-channel, Wilson side channel, various riparian planting sites). In the case of hard to access potential cold-water spots, CCNRD will couple ground-based longitudinal profiling with spot checking to allow access to these spots along the survey.

River access for summer drone-based FLIR in Peshastin will be via public access off Hwy 97. Potential reaches for winter drone-based FLIR on the Wenatchee have been selected based on the potential for ground water seeps associated with off-channel habitat and reach priority (Table 1). However, priority rank (UCSRB 2020) was trumped by ease of access to assure work can be completed. Selected lower Wenatchee reaches are accessible via CCNRD past restoration projects (CMZ 6, 11, and 12; Monitor side channel) or from public access locations (confluence park, monitor park, hwy 2).

Ice and snow can make winter drone-based FLIR monitoring difficult or impossible. Therefore, CCNRD will conduct these surveys when stream temperatures drop below 10 deg C, but before significant ice and snow, likely in late November. Doing these flights in-house will allow for quick coordination and momentary planning based on weather forecasts.

Difficult navigation: Upper Peshastin creek (RM 9 - 16) is difficult to navigate which would make summer ground-based longitudinal profiles very cumbersome. To circumvent this issue, staff will conduct drone-based FLIR profiles in the summer instead of ground-based profiles in select reaches in the upper Peshastin.

- #7: How have lessons learned from completed projects or monitoring studies informed this project?

The proposed Assessment is an extension of the work CCNRD completed in 2020 for RCO agreement 17-1241, Thermal Refuge in the Upper Wenatchee and Entiat Planning project.

Overall lessons learned were that the methods successfully closed the thermal refuge data gap, and that the information is a highly valuable resource for project sponsors in terms of project development.

The current proposal will incorporate important lessons learned concerning winter drone-based FLIR data. Instead of contracting the work out to a consultant as in the past effort, CCNRD will complete drone-based FLIR in-house. The consultant did not have the ability to capitalize on short weather windows ideal for data collection (clear skies, cold temperatures, before ice formation) because of distance away and other commitments. Therefore, early weather windows were missed and the clear day that was chosen for data collection was not ideal due to ice and snow, resulting in data that was sub-par. By completing the data in-house, CCNRD staff will be able to capitalize on short weather windows in early fall and therefore collect the data at the opportune time. We hope that this change in data collection will help the region learn more about winter FLIR data collection, its utility for locating ground water seeps, and the potential for informing juvenile winter survival.

Lastly, in the previous effort, CCNRD wasted a lot of time and money trying to rent inflatable kayaks, so this project includes IK purchase.

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#8: Describe the alternatives considered and why the preferred was chosen.

Repeat airborne (helicopter based) FLIR in project reaches: Even though FLIR is old, both the Methow Thermal Refuge Assessment and the Upper Wenatchee Thermal Refuge Assessment found the data is still useful and most areas indicated in old FLIR datasets were found. Also, repeating FLIR would still necessitate ground-truthing areas.

Just do cold-spot checking and do not do longitudinal profiling: Longitudinal profiling serves many purposes. First, sponsors have expressed (Kane Natural Resources, CCFEG) that longitudinal profiling data provides a very useful context for planning projects, and couples well with the point-based thermal refuge data for understanding how thermal refuge is situated in the thermalscape, for example if it is in a warming or cooling reach, and how it effects downstream temperatures. Profiling also was useful in identifying thermal refuge that may have been missed, i.e. by reviewing the data later, or by chance encounter during a profile (e.g. spotting an orchard drain on a float). There are other continuous data available or in development (e.g. SSN models), but they show heterogeneity on a ~1-2 km scale, while profiling shows heterogeneity on the scale of ~3 meters, which is an important scale at which fish move into thermal refuge areas. Lastly, coupling cold-spot checking with ground-based floats in one multi-faceted survey works well, making continuous longitudinal profiling an easy, inexpensive and highly beneficial add to the field day.

Skip drone-based FLIR winter profiling: Winter rearing temperature is a high priority limiting factor in reaches. Since FLIR only captures surface water temperatures, and ground water is cooler and therefore sinks in the summer, summer FLIR likely misses some ground water inputs. On the other hand, ground water is warmer and rises to the surface in winter, so winter profiling may capture warm water spots that potential serve as warm water refuge in the winter and cool water refuge in the summer.

#9: How were stakeholders consulted in the development of this project? Identify the stakeholders, their concerns or feedback, and how those concerns were addressed.

This project does not involve either the design or implementation of any construction, so there have not been any concerns from stakeholders regarding the project. However, CCNRD consulted with Tracy Bowerman, Science Program Manager for the Upper Columbia Salmon Recovery Board (UCSRB) and Aimee Fullerton, Research Fishery Biologist with NOAA Fisheries, in the development of the project.

Tracy Bowerman met with Adrienne Roumasset and Matt Holland from CCNRD on February 13th 2023 to discuss a strategy to meet several UC temperature data gaps. We presented the idea for this assessment during the meeting, and have incorporated Bowerman's suggestions into the proposal. Bowerman was very supportive, and suggested contacting Aimee Fullerton (NOAA Fisheries) regarding her work as background support for the project. Bowerman also agreed to act as a partner on the project (see attached letter of support).

Fullerton has also expressed support for the project, and agreed to work in a supportive partnership role with CCNRD should the proposed project receive funding. Fullerton's work has involved gathering continuous temperature logger data in reaches throughout free-flowing sections of the Wenatchee Basin, and using the data to develop a model that predicts hourly temperatures at a ~1-2 km scale. The proposed project will collect temperature data at a 3 meters or less scale, which Fullerton agreed will work well with her model to tell the full story of temperature heterogeneity.

#10: Does your project address or accommodate the anticipated effects of climate change?

Yes

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#10a: How will your project be climate resilient given future conditions?

Currently there is no information available to sponsors about thermal refuge (either location or opportunities) in the lower Wenatchee River and Peshastin Creek. The proposed project will provide this information in a variety of readily available formats. We know that water temperatures will increase in the future and therefore thermal refuge will be critical to the survival of our listed species. Except in the case of major geomorphic alterations, location of these thermal refuge areas will likely remain the same. Therefore, relatively cool areas will only increase in relevance as ambient temperatures reach ESU thermal limits more often. Furthermore, the proposed assessment will continue to lead to projects that strive to increase habitat quantity and quality of thermal refuge, thus providing more habitat for species existing at the margin of thermal tolerances and increasing overall survival as conditions warm.

#10b: How will your project increase habitat and species adaptability?

The proposed assessment will help increase adaptability to climate change by identifying opportunities to restore, enhance, and protect thermal refuge areas. Climate change models predict summer stream temperatures will increase within Chelan county (Hamlet 2013), effectively shrinking available ESA-listed salmonid habitat and increasing mortality due to temperatures that exceed thermal limits (Gaines 2013, Mantua 2010). Salmonids have been observed to use thermal refuge areas to thermoregulate and increase survival, when ambient stream temperatures reach 22 deg C - a commonplace summer temperature in project reaches. Access to thermally diverse habitats (e.g. access to thermal refuge), promotes diversity in salmon life history strategies, and may enable persistence as the climate changes (Siegel et al). This project will allow for the consideration of thermal diversity in all restoration actions in target reaches, thus increasing species adaptability, persistence, and recovery.

#11: Describe the sponsor's experience managing this type of project. Describe other projects where the sponsor has successfully used a similar approach.

CCNRD staff has developed a robust post-construction and pre-design data collection program. This includes a variety of techniques and collaboration with a wide range of partners. Stream flow, temperature, groundwater wells, topo survey, fish use and plant survival are routinely included with this work. CCNRD has a long history of managing assessment, design, construction and planning projects with a multitude of funding agencies including RCO. Additionally, CCNRD managed and completed the Upper Wenatchee Thermal Refuge Assessment, which used almost identical methods (excepting the current addition of the proposed in-house winter drone-based FLIR). This project was highly successful, and the multiple products of the RCO-funded work (online map portal, pdf Assessment and data Appendices, and shapefiles) are regularly referenced and used by UC salmon recovery project sponsors.

#12: Will veterans (including the veterans conservation corps) be involved in the project? If yes, please describe.

No

Planning Supplemental

#1: Is the project an assessment / inventory?

Yes

Project Application Report - 23-1287

#1a: 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 notable Spatial Statistical Network (SSN) models have been developed in the area that strive to describe and predict continuous longitudinal temperature in freeflowing streams in the Wenatchee Basin. One, the widely available NorWEST model, is useful but has a high degree of error. Aimee Fullerton with NOAA has recently developed a model that has resulted in predictions at a much finer scale, with less error and that produces hourly predictions of temperature across the basin. Still, outputs of the model represent well-mixed mainstem temperatures of ~1-2 km stream reaches, and therefore do not reflect finer scale thermal heterogeneity that form thermal refuge areas that have important impacts on ESA-listed species (Siegel and Fullerton et al PrePrint). The proposed project will fill this crucial data gap on location and characteristics of thermal refuge areas. Fullerton has also agreed to be a partner in this project, so that the two datasets can work together to tell the full, multi-scalar story of the thermal riverscape.

#1b: How does the project fill a data gap, identified as a high priority in your regional recovery plan, that clearly limits subsequent project identification or development?

This project will meet the following Tier 1, habitat data gap listed in the regional recovery plan's 2023 data gap list: "Location and characteristics of thermal refuge areas". The list explicitly calls out the 2020 Upper Wenatchee Thermal Refuge Assessment, which was funded under the 2017 SRFB round, as a recommended method to fill this gap (see "Progress" column). The proposed project will extend that work to the Lower Wenatchee river and Peshastin creek, which are identified as Tier 2 Assessment Unit priorities for steelhead and spring Chinook, and both list temperature as a rank 1 (unacceptable) limiting factor. Currently, there is no information, either on location or opportunities, regarding thermal refuge in project reaches, which directly limits project identification and development.

#1c: How does the project fit in the larger context such as its fit with a regional recovery-related, scientific research agenda or workplan - and how will it address the identified high priority data void? Work with your lead entity and region to obtain a letter of support to attach.

CCNRD has developed this project in coordination with UCSRB Science Program Manager, Tracy Bowerman (see letter of support attached). Bowerman is actively working with sponsors on a comprehensive strategy to meet several temperature data gaps limiting recovery, including the one listed above. The strategy includes using Fullerton's work to meet the following data gap: "Temperature and its changes within specific reaches or Assessment Unit of the UC", and the proposed project which follows the established method to meet the Tier 1 data gap (see #1b). The project will meet this gap by collecting continuous temperature data on the microhabitat scale (3 meters or less), and ground truthing potential cold water patches indicated in 2001-2003 FLIR and other datasets. Found spots will be mapped and characterized quantitatively and qualitatively. Project reaches will be thoroughly surveyed so that the data gap is fully met within the Lower Wenatchee (RM 0-26.5) and Peshastin (0-16).

#1d: Why are SRFB (or PSAR) funds necessary for the project, rather than other sources of funding?

This project addresses priorities as identified in the regional Biological Strategy and Prioritization for Salmon Recovery (UCSRB 2020). It addresses a tier 1 data gap to improve water quality and habitat conditions for ESA-listed species.

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#2: Is your project a Barrier / Screening Diversion Inventory Project?

No

#3: Is this a fish passage design / screening design project?

No

#4: Will the project develop a design?

No

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Planning Metrics

Worksite: Peshastin Creek RM 0 - 16 (#1)

Area Encompassed (acres) (B.0.b.1)	0
Miles of Stream and/or Shoreline Affected (B.0.b.2)	16.00

EQUIPMENT

Purchase miscellaneous equipment

Total cost for Purchase miscellaneous equipment	\$23,315
Number of miscellaneous equipment items	8
Describe the miscellaneous equipment being purchased	Equipment includes and Ipad with MapPlus software, 2 inflatable kayaks and paddles, temperature monitoring equipment, and Drone and FLIR camera setup with software.

SALMONID HABITAT ASSESSMENT / INVENTORY

Instream survey (B.2.c)

Total cost for Stream survey	\$44,426
Type of stream assessment (B.2.c.1)	Instream Habitat Condition Assessment
Stream Miles Assessed (B.2.c.2)	16.00
Stream miles assessed that contained salmonids (B.2.c.3)	16.00
Stream Miles Assessed That Needed Restoration (B.2.c.4)	
Stream Miles Assessed For Regulatory Actions (B.2.c.5)	0
Number of fish passage impediments identified (B.2.c.6)	0

Worksite: Lower Wenatchee River RM 0 - 25.6 (#2)

Area Encompassed (acres) (B.0.b.1)	0
Miles of Stream and/or Shoreline Affected (B.0.b.2)	25.60

SALMONID HABITAT ASSESSMENT / INVENTORY

Instream survey (B.2.c)

Total cost for Stream survey	\$46,244
Type of stream assessment (B.2.c.1)	Instream Habitat Condition Assessment
Stream Miles Assessed (B.2.c.2)	26.50
Stream miles assessed that contained salmonids (B.2.c.3)	26.50
Stream Miles Assessed That Needed Restoration (B.2.c.4)	
Stream Miles Assessed For Regulatory Actions (B.2.c.5)	0
Number of fish passage impediments identified (B.2.c.6)	0

Overall Project Metrics

COMPLETION DATE

Projected date of completion	1/1/2026
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Planning Cost Estimates

Worksite #1: Peshastin Creek RM 0 - 16

Category	Work Type	Estimated Cost	Note
Equipment	Purchase miscellaneous	\$23,315	

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Category	Work Type	Estimated Cost	Note
Salmonid Habitat Assessment / Inventory	equipment Instream survey (B.2.c)	\$44,426	
	Subtotal:	\$67,741	
	Total Estimate For Worksite:	\$67,741	

Worksite #2: Lower Wenatchee River RM 0 - 25.6

Category	Work Type	Estimated Cost	Note
Salmonid Habitat Assessment / Inventory	Instream survey (B.2.c)	\$46,244	
	Subtotal:	\$46,244	
	Total Estimate For Worksite:	\$46,244	

Summary

Total Estimated Costs:	\$115,804
Total Estimated Planning Costs:	\$115,804

Cost Summary

	Estimated Cost	Project %	Admin/AA&E %
<u>Planning Costs</u>			
Planning	\$113,985		
SUBTOTAL	\$113,985	100.00 %	
Total Cost Estimate	\$113,985	100.00 %	

Funding Request and Match

FUNDING PROGRAM

Salmon State Projects	\$82,968	71.645194 %
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SPONSOR MATCH

OTHER MONETARY FUNDING	GRANT - STATE	
Amount		\$32,836.00
Funding Organization		Washington Department of Ecology
Grant Program		Water Quality Centennial

Match Total:	\$32,836.354806 %	
Total Funding Request (Funding + Match):	\$115,804	100.000000 %
		! Difference from Total Cost Estimate: (\$1,819)

Questions

#1: Explain how you determined the cost estimates

We determined CCNRD staff time estimates using hourly rates and time estimates to complete work (project management, accounting, director costs, FLIR surveys, field technician). Costs for Assessment work such as cold-spot checking, ground-based profiling, and Assessment preparation were estimated using rates from the Project Scientist that completed the 2020 Upper Wenatchee Assessment. Map portal cost was from a consultant quote. Equipment was from online quotes.

Cultural Resources

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Cultural Resource Areas

Worksite #1: Peshastin Creek RM 0 - 16

Area: Peshastin Creek data collection

#1: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

This project does not include ground disturbing activities.

#2: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

N/A

#3: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

No

There is no "worksite", this project will monitor existing conditions and not alter or plan to alter existing conditions.

#4: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

No

#5: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

No

#6: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

Unknown

Worksite #2: Lower Wenatchee River RM 0 - 25.6

Area: Wenatchee River data collection

#1: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

This project does not include ground disturbing activities.

#2: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

N/A

#3: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

No

There is no "worksite", this project will monitor existing conditions and not alter or plan to alter existing conditions.

#4: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

No

#5: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

No

#6: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

Unknown

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Project Permits

Permits and Reviews

None - No permits Required

Issuing Organization	Applied Date	Received Date	Expiration Date	Permit #
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Attachments

Required Attachments

6 out of 6 done

- Applicant Resolution/Authorizations ✓
- Cost Estimate ✓
- Landowner acknowledgement form ✓
- Map: Planning Area ✓
- Photo ✓
- RCO Fiscal Data Collection Sheet ✓

PHOTOS (JPG, GIF)

Photos (JPG, GIF)



559165








559190

PROJECT DOCUMENTS AND PHOTOS

Project Documents and Photos

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File Type	Attach Date	Attachment Type	Title	Person	File Name, Number Associations	Shared
	11/15/2023	Agreement - State	23-1287 Agreement - Lower Wen. and Peshastin Thermal Ref. As	DeenaR	23-1287 Agreement - Lower Wen. and Peshastin Thermal Ref. Assessment - signed.pdf, 585933	✓
	10/06/2023	Map: Area of Potential Effect (APE)	Project APE Report (10/06/23 16:39:13)	MarkJ	Project APE Report - 23-1287 (10-06-2023_16-39-13).pdf, 581490	✓
	10/06/2023	Cultural Resource Screening Report	Project Cultural Resource Screening Report (10/06/23 16:39:1)	MarkJ	Project Cultural Resource Screening Report - 23-1287 (10-06-2023_16-39-12).pdf, 581489	✓
	10/06/2023	Project Application Report	Project Application Report, 23-1287P (sub 10/06/23 16:39:12)	MarkJ	Project Application Report - 23-1287 (submitted 10-06-2023_16-39-12).pdf, 581488	✓
	10/06/2023	Project Review Comments	Proj Review Comments LE, 23-1287P(compl 10/06/23 16:38)	MarkJ	Project Review Comments Report - 23-1287 (compl 10-06-2023_16-38-53).pdf, 581487	✓
	10/06/2023	Project Review Comments	Proj Review Comments Initial, 23-1287P(compl 10/06/23 16:38)	MarkJ	Project Review Comments Report - 23-1287 (compl 10-06-2023_16-38-49).pdf, 581486	✓
	07/03/2023	Application Review Report	Grant Manager Comments, 23-1287P(compl 07/03/23 09:21)	AmeeB	Grant Manager Comments Report - 23-1287 (compl 07-03-2023_09-21-13).pdf, 569014	✓
	06/26/2023	RCO Fiscal Data Collection Sheet	2023 SRFBFiscalDataCollectionSheet_CCNRD_	AdrienneR	2023 SRFBFiscalDataCollectionSheet_CCN... 567880	
	06/26/2023	Project Application Report	Project Application Report, 23-1287P (sub 06/26/23 11:35:37)	DavidH	Project Application Report - 23-1287 (submitted 06-26-2023_11-35-37).pdf, 567817	✓
	05/24/2023	Application Review Report	Grant Manager Comments, 23-1287P(rtnd 05/24/23 09:52)	AmeeB	Grant Manager Comments Report - 23-1287 (rtnd 05-24-2023_09-52-15).pdf, 563713	✓
	05/18/2023	Project Application Report	Updated 5.18.23_Project Application Report - 23-1287.pdf	AdrienneR	Updated 5.18.23_Project Application Report - 23-1287.pdf, 563343	✓
	05/18/2023	Visuals	Table 1. Drone-based FLIR reaches.pdf	AdrienneR	Table 1. Drone-based FLIR reaches.pdf, 563338	✓
	05/18/2023	Project plan document	Updated Jot Form and Cover Page_Thermal Refuge.pdf	AdrienneR	Updated Jot Form and Cover Page_Thermal Refuge.pdf, 563327	✓
	05/18/2023	Final project report	2020UpWenatchee_ThermalRefugeAsses:	AdrienneR	2020UpWenatchee_ThermalRefugeA... 563212	✓
	05/18/2023	Final project report	2020UpWenatchee_ThermalRefugeAsses:	AdrienneR	2020UpWenatchee_ThermalRefugeA... 563210	✓
	04/21/2023	Project Application Report	Project Application Report, 23-1287P (sub 04/21/23 14:16:48)	AdrienneR	Project Application Report - 23-1287 (submitted 04-21-2023_14-16-48).pdf, 559192	✓
	04/21/2023	Photo	fish in groundwater seep.jpg	AdrienneR	fish in cold spot.jpg, 559190	✓
	04/21/2023	Landowner acknowledgement form	Landowner Statement.pdf	AdrienneR	Landowner Statement.pdf, 559187	
	04/21/2023	Visuals	References.pdf	AdrienneR	References.pdf, 559175	✓
	04/21/2023	Letters of Support	TB CCNRD Thermal Refuge Assessment Letter of Support[16076].	AdrienneR	TB CCNRD Thermal Refuge Assessment Letter of Support[16076].pdf, 559173	✓
	04/21/2023	Visuals	Figures 1 and 2.pdf	AdrienneR	Figures 1 and 2.pdf, 559172	✓
	04/21/2023	Map: Planning Area	PlanningAreaMap_ThermalRefuge.pdf	AdrienneR	PlanningAreaMap_ThermalRefuge.pdf, 559171	✓
	04/21/2023	Cost Estimate	CCNRD_SAL_Cost Estimate Thermal Refuge.xlsx	AdrienneR	CCNRD_SAL_Cost Estimate Thermal Refuge.xlsx, 559168	✓
	04/21/2023	RCO Fiscal Data Collection Sheet	2023 SRFBFiscalDataCollectionSheet_CCNRD_	AdrienneR	2023 SRFBFiscalDataCollectionSheet_CCN... 559167	
	04/21/2023	Applicant Resolution/Authorizations	2023 ApplicantAuthorizationResolution_CCNRD	AdrienneR	2023 ApplicantAuthorizationResolution_CC... 559166	✓
	04/21/2023	Photo	cmz12_lowerWenatchee.jpg	AdrienneR	cmz12.jpg, 559165	✓

Project Application Report - 23-1287

Application Status

Application Due Date: null

Status Name	Status Date	Submitted By	Submission Notes
Application Complete	07/03/2023	Amee Bahr	Thank you for addressing comments. Your project was cleared by the Review Panel for 2023 SRFB funding. We will be in touch regarding your agreement after the September Board meeting. Please let us know if you have any questions.
Application Resubmitted	06/26/2023	David Hecker	
Application Returned	05/24/2023	Amee Bahr	This project is cleared, but there are few things in the Grant Manager Comments page I would like you to address. When finished, please resubmit the application and I will move it to App Complete. Thanks for a great project application!
Application Submitted	04/21/2023	Adrienne Roumasset	
Preapplication	04/06/2023		

I certify that to the best of my knowledge, the information in this application is true and correct. Further, all application requirements due on the application due date have been fully completed to the best of my ability. I understand that if this application is found to be incomplete, it will be rejected by RCO. I understand that I may be required to submit additional documents before evaluation or approval of this project and I agree to provide them. (David Hecker, 06/26/2023)

Date of last change: 02/22/2024

DESIGN PROJECTS

The costs on this page are for design projects, not for the design phase of a restoration grant.

				OVERALL PROJECT	GRANT REQUEST	MATCH				
				Budget must account for all costs to complete the project	Enter only the amount of the grant request	The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.				
				Amount	Grant Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)	
Design Costs										
Category	Task Description	Qty	Rate							
Administrative	Director	30.00	\$ 73.94	\$ 2,218	\$ 2,218	\$ -	\$ -			
Administrative	Accountant	50.00	\$ 52.49	\$ 2,625	\$ 2,625	\$ -	\$ -			
Administrative	Project Manager	100.00	\$ 45.27	\$ 4,527	\$ 4,527					
Data collection	Peshastin drone-based FLIR	128.00	\$ 49.50	\$ 6,336	\$ -	\$ 6,336	\$ -			
Data collection	Wenatchee drone-based FLIR	161.00	\$ 49.50	\$ 7,970	\$ 7,970	\$ -	\$ -			
Data collection	Field technician help	200.00	\$ 41.94	\$ 8,388	\$ 8,388	\$ -	\$ -			
Other	Data review and Field Planning	40.00	\$ 75.00	\$ 3,000	\$ 3,000					
Data collection	Peshastin ground-based collection	100.00	\$ 75.00	\$ 7,500	\$ -	\$ 7,500	\$ -			
Data collection	Wenatchee ground-based collection	130.00	\$ 75.00	\$ 9,750	\$ 9,750	\$ -	\$ -			
Assessments (geologic, hydraulic, etc.)	Manage data, Assessment develop	330.00	\$ 75.00	\$ 24,750	\$ 24,750	\$ -	\$ -			
Other	Meetings to disseminate info	30.00	\$ 75.00	\$ 2,250	\$ 2,250	\$ -	\$ -			
Other	Develop online portal	1.00	\$ 7,000.00	\$ 7,000	\$ 7,000	\$ -	\$ -			
Equipment	iPad and MapPlus software	1.00	\$ 800.00	\$ 800	\$ 800	\$ -	\$ -			
Equipment	Inflatable Kayak and paddle	2.00	\$ 1,883.00	\$ 3,766	\$ 3,766	\$ -	\$ -			
Equipment	Garmin GPSmap 78	1.00	\$ 400.00	\$ 400	\$ 400	\$ -	\$ -			
Equipment	Solinist levellogger	1.00	\$ 720.00	\$ 720	\$ 720					
Equipment	AquaTuff Thermocouple and probe	1.00	\$ 362.00	\$ 362	\$ 362					
Equipment	other supplies: PVC case, dowel for pro	1.00	\$ 150.00	\$ 150	\$ 150					
Equipment	FLIR imagery processing software, Pix4	1.00	\$ 5,000.00	\$ 5,000		\$ 5,000				
Equipment	DJI M30T Drone and FLIR camera	1.00	\$ 14,000.00	\$ 14,000		\$ 14,000				
Other	Mileage	1,000.00	\$ 0.66	\$ 655	\$ 655	\$ -	\$ -			
				STotal	\$ 112,166	\$ 79,330	\$ 32,836	\$ -		
Indirect Costs				Amount	Grant amount	Match in PRISM	Funding not reported in PRISM	Match Source	Match Type (federal, state, local)	
	Description	Approved Rate	Total Project Base							
	Indirect	20.600%	\$ 17,660.69	\$ 3,638	\$ 3,638	\$ -	\$ -			
	Indirect	0.000%	\$ -	\$ -	\$ -	\$ -	\$ -			
				STotal	\$ 3,638	\$ 3,638	\$ -			
				Totals	\$ 115,804	\$ 82,968	\$ 32,836	\$ -		

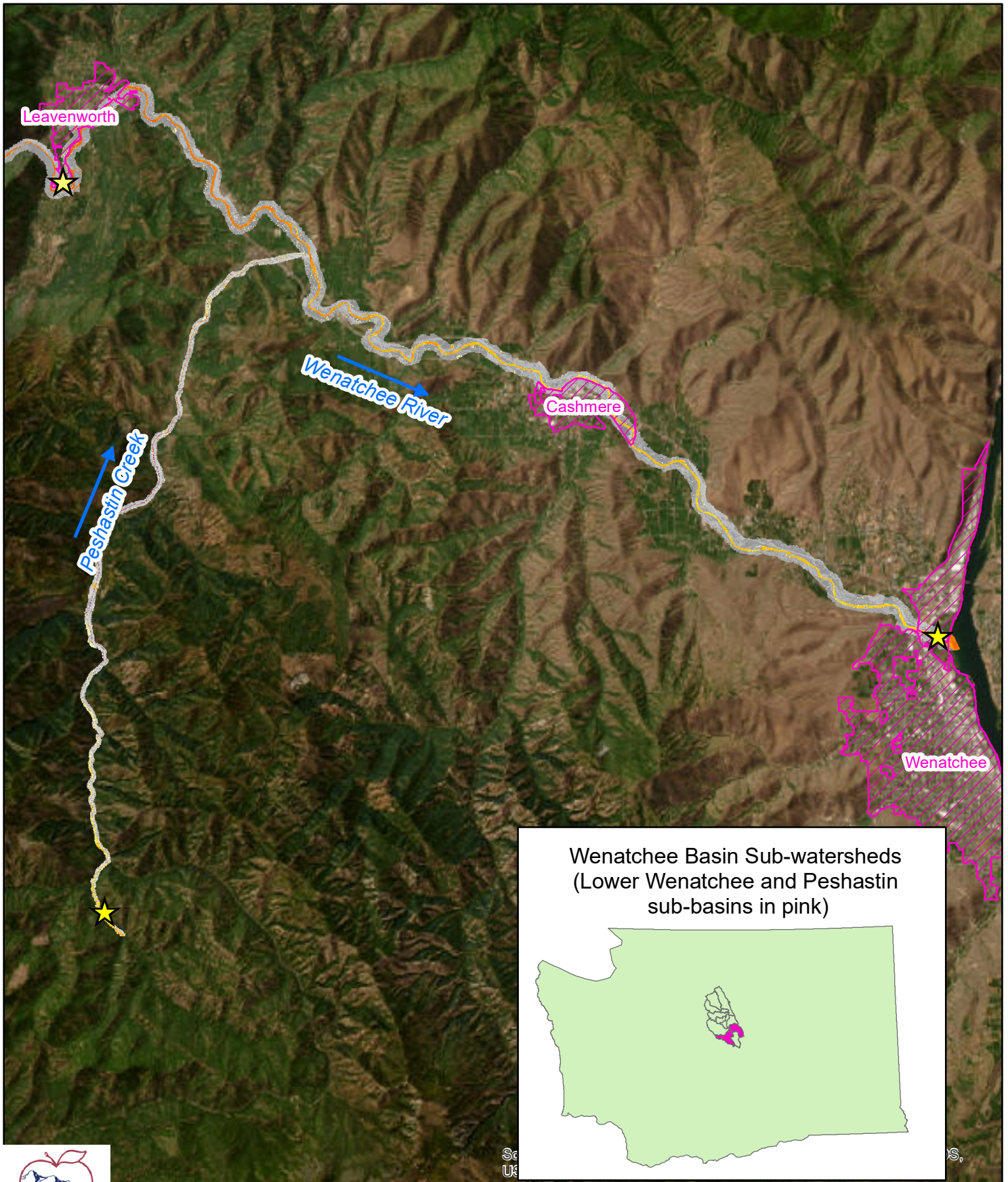
CUMULATIVE TOTALS

This sheet contains automatic calculations

Project Name	Lower Wen. And Peshastin Thermal Ref. Assessment
SRFB #	23-1287 PLAN
Sponsor	Chelan Co Natural Resource

	OVERALL PROJECT Cost	GRANT REQUEST Amount	PRISM MATCH Amount	MATCH NOT IN PRISM Amount	Budget Check
<u>Sheet #1 Acquisition</u>					
Property Costs	\$ -	\$ -	\$ -	\$ -	0
Incidental Costs	\$ -	\$ -	\$ -	\$ -	0
Administrative Costs	\$ -	\$ -	\$ -	\$ -	0
Indirect Costs	\$ -	\$ -	\$ -	\$ -	
STotal	\$ -	\$ -	\$ -	\$ -	0
<u>Sheet #2 Design</u>					
Design Costs	\$ 112,166	\$ 79,330	\$ 32,836	\$ -	
Indirect Costs	\$ 3,638	\$ 3,638	\$ -	\$ -	
STotal	\$ 115,804	\$ 82,968	\$ 32,836	\$ -	0
<u>Sheet #3 Restoration</u>					
Construction Costs	\$ -	\$ -	\$ -	\$ -	0
AA&E	\$ -	\$ -	\$ -	\$ -	0
Indirect Costs	\$ -	\$ -	\$ -	\$ -	
STotal	\$ -	\$ -	\$ -	\$ -	0
Totals	\$ 115,804	\$ 82,968	\$ 32,836	\$ -	0

Planning Area Map: Lower Wenatchee and Peshastin Thermal Refuge Assessment (with 2001 - 2003 FLIR overlay)



★ Assessment Reach Breaks



0 0.75 1.5 3 4.5 6 Miles



Chelan Co Natural Resource; Lower Wen. and Peshastin Thermal Ref. Assessment (#23-1287)

Attachment #559165, cmz12_lowerWenatchee.jpg



Chelan Co Natural Resource; Lower Wen. and Peshastin Thermal Ref. Assessment (#23-1287)

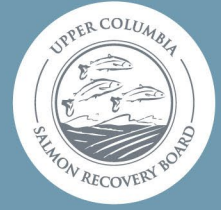
Table 1. Potential summer and winter drone based FLIR reaches (see note in italics below)

Season	Assessment Unit	Reach number	Reach Priority	Features/Rationale	RMs - reach endpoints (total)
Summer	Upper Peshastin	all	unranked	slope too steep for ground-based profiles, hwy access for drone survey	16.3 - 9.1 (7.2)
Winter	Tumwater	1	1	off-channel habitat (blackbird island)	26.5-25.3 (1.2)
Winter	Ollala	2	1	off-channel habitat (CMZ 12 and CMZ 11)	15.2-12.7 (2.5)
Winter	Nahahum	5	2	off-channel (Monitor side channel)	6.6 - 4.8 (1.8)
Winter	Nahahum	4 & 3	3	off-channel (sleepy hollow, CMZ 6, other)	4.8 - 1.5 (3.3)
Winter	Nahahum	1	1	off-channel and Columbia confluence	0.8 - 0 (0.8)

Peshastin summer FLIR, potential reach total: 7.2 RMs
Wenatchee Winter FLIR, potential reach total: 9.6 RMs

**Pending access and feasibility, drone-based FLIR will occur on at least 5 RMs on both the Wenatchee River and Peshastin creeks (for a total of 10 RMs) This will include a subset (or all if deemed feasible) of the reaches detailed in the table above*

Working to restore viable and sustainable populations of salmon, steelhead and other at-risk species through collaborative, economically sensitive efforts, combined resources, and wise resource management of the Upper Columbia Region.



April 20, 2023

Dear RCO Grant Manager,

It is my pleasure to write a letter in support of the Chelan County Natural Resources' (CCNRD) Lower Wenatchee and Peshastin Thermal Refuge Assessment. As the Science Program Manager for the Upper Columbia Salmon Recovery Board, I assist sponsors in planning monitoring projects and Assessments that can best meet our regional goals to recover ESA-listed steelhead, spring Chinook and Bull Trout. This includes developing strategies and offering guidance to sponsors for how to incorporate the best available methods and technology to meet regional data gaps and thus support recovery efforts in our region.

I met with Adrienne Roumasset and Matt Holland from CCNRD on February 13th, 2023, to discuss strategies to address several temperature-related data gaps, as identified by the Upper Columbia Region's Monitoring and Data Management Committee. These data gaps are identified as: 1) "Temperature and its changes within specific reaches or Assessment Unit of the UC", and 2) "Location and characteristics of thermal refuge areas". The Lower Wenatchee and Peshastin Thermal Refuge Assessment will specifically address this second data gap, which is identified as a high priority for restoration projects and related salmon recovery efforts. CCNRD's 2020 Upper Wenatchee Thermal Refuge Assessment provided valuable data that has helped sponsors incorporate thermal refugia in their project planning. The Methow Salmon Recovery Foundation subsequently applied similar methods to identify thermal refugia in the Methow Subbasin. The proposed Lower Wenatchee and Peshastin Assessment will provide valuable thermal refuge and longitudinal temperature data that will address the identified data gap and provide high resolution temperature information for the entirety of the mainstem Wenatchee River, along with several important salmon and steelhead spawning tributaries.

In summary, the UCSRB supports the Lower Wenatchee and Peshastin Thermal Refuge Assessment and looks forward to continuing our work with CCNRD to gain more information about how thermal refuge functions on the riverscape. Stream temperatures are only predicted to get warmer, so it is crucial that we gain this information soon, so we can most effectively design and implement restoration projects that sustain their benefits as the climate warms.

Sincerely,

Tracy Bowerman

Tracy Bowerman, Ph.D.

Science Program Manager, Upper Columbia Salmon Recovery Board