# Bureau of Reclamation, WaterSMART
# Notice of Funding Opportunity No. R23AS00446
# Applied Science Grants for Fiscal Year 2023
# CFDA: 15.557

**Project Title**: Snoqualmie Tribe Ancestral Forest—Data Driven Headwaters Management

## Applicant Information:

**Applicant Name:** Snoqualmie Indian Tribe
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**Contact Info:** Cindy Spiry, ENR Director, cindy@snoqualmietribe.us, 206-384-6588
**Project Manager:** Kelsey Payne, Water Quality Manager, kelsey.payne@snoqualmietribe.us, 425-414-6340
**UEI number:** LD6KX4L8KLW9

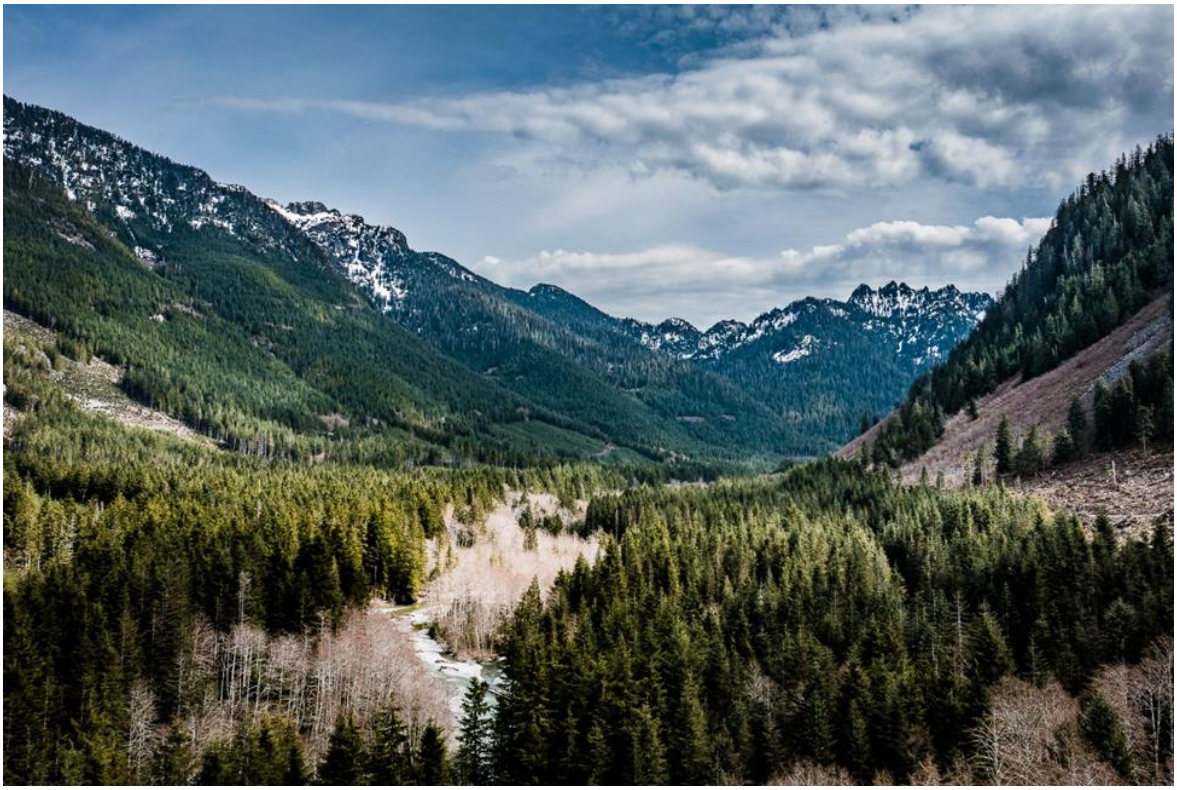

Figure 1. Photo of the North Fork Tolt River winding its way through the dramatic peaks of the Snoqualmie Tribe Ancestral Forest.

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## Executive Summary

**Date:** October 17th, 2023
**Applicant:** Snoqualmie Indian Tribe
**Location:** Unincorporated King County, Washington State
**Project Timeline:** April 1st, 2024- September 30th, 2026

The Snoqualmie Indian Tribe (Tribe) proposes a watershed evaluation in the Snoqualmie Tribe Ancestral Forest (STAF) to create tools that will be immediately used to inform management actions. The Tribe will utilize newly acquired flow data, temperature data, and water quality chemistry to inform management decisions that will benefit the entire watershed, from the headwaters down to the Snoqualmie River which has been stewarded by the Tribe since time immemorial. The Tribe will produce databases, detailed GIS mapping, and models that will help the Tribe to make sound management decisions in the near term. The need for this work is pressing, as climate change is already negatively impacting the health of the watershed for ESA (Endangered Species Act) listed salmon species and cultural and traditional practices for the Tribe.

The proposed project is not located on a federal facility.

## Technical Project Description

### Applicant Category

The Snoqualmie Indian Tribe is a federally recognized Indian Tribe and is qualified to submit this application for the Bureau of Reclamation WaterSMART-Applied Science Grants for Fiscal Year 2023 as a Category A applicant. The Snoqualmie Tribe was a party to the Treaty of Point Elliott (1855), which was signed by Governor Stevens and ratified by the United States Senate. In 1953 the Snoqualmie Tribe lost its federal recognition and did not receive re-recognition until October 6, 1999. It was not until 2006 that the Tribe successfully underwent the fee to trust process and started building the initial Snoqualmie Reservation. The reservation near the Tolt River, tributary to the Snoqualmie River, that was promised to the Snoqualmie Tribe by the federal government never came to fruition.

In late 2021, through fee simple acquisition, the Tribe reclaimed 12,000 acres of forest lands in east King County along the North Fork Tolt. The Tribe has named this property the Snoqualmie Tribe Ancestral Forest. Prior to the Tribe’s reclamation, the land had been managed as a tree plantation by several timber corporations for over 100 years. The Tribe is now collecting data and create tools that will be utilized immediately to inform management actions that will benefit both water quality and quantity. This land's reclamation by the Tribe has resulted in expanded opportunities to heal the land and water from industrial, extractive forest practices.

## Project Description

The Snoqualmie Tribe will focus this project on protecting water quantity and quality in the upper watershed of the North Fork Tolt. To do this, the deliverables will be broken up into six main project components:

1. Drone based water collection
2. Wetland mapping with thermal imagery
3. VELMA (Visualizing Environmental Landscape Management Assessments) model of buffer and timber harvest scenarios
4. Installing stream gauges and developing a database for flow data
5. Developing a database for temperature logger data
6. Laboratory analysis of water samples and developing a water quality database

Sections of the STAF are too remote to access by vehicle or foot. Roads, while extensive throughout the property, are limited in scope and accessibility. Even when roads and trails can lead into more rugged sections of the forest, there are many areas that are too dangerous to traverse on foot. However, it is these headwaters that we are interested in studying further, to inform the Tribe's upcoming Forest Practice Applications (FPAs), where the Tribe determines where and how to harvest timber. To collect water at these remote locations, we are interested in utilizing drones to perform water collection. The samples can then be analyzed with probes or transported to a water quality laboratory for further analysis.

In a similar vein, using thermal based imaging with drones could allow the Tribe to determine where high value wetlands are located on STAF where currently available imagery is insufficient. This will allow the Tribe to incorporate appropriate buffers into timber harvesting practices and prioritize restoration efforts. Calibration of a VELMA model utilizing STAF stream gauge data will go even further to provide information on how different vegetated buffer widths may meet Tribal management objectives, such as helping the Tribe to determine timber harvest timing that would have the least impact on water quality and greatest benefit to surface water flows. The Tribe will test the impacts to water quality and quantity under different buffer widths and timber harvest rotation scenarios to determine which scenarios have the greatest benefit.

The Tribe is creating new data that will inform on overall water quantity and quality in STAF and has implications for the health of the downstream watershed. There are three components of in-stream data collection proposed. The first is installing stream gauges on the east and west bridges crossing the North Fork Tolt. By collecting flow data at two points on the property, the Tribe can accurately evaluate flooding events and summer flows (see Figure 2). This data will be transferred remotely via satellite to the Snoqualmie Tribe server where it will be stored and analyzed. This data will feed into the VELMA model and be used for timber harvest buffer width testing.

As part of a concurrently running project at STAF (match for this proposal—the North Fork Tolt River Assessment project), nineteen temperature dataloggers were installed along the North Fork Tolt and its major tributaries. Now that the dataloggers have been installed and checked for function and accuracy, the data must be uploaded to a database. The creation and management of the database is a priority for this proposal and will allow the Tribe to determine where there are hot spots that need special protections from timber harvest and where there are sources of cool, hyperic flow that need additional buffers.

While water temperature data will undoubtedly help the Tribe to better tailor forest practices at the STAF, more data is needed to fully determine what kind of solutions are required to improve water quality. The last piece of the project is to take water samples and analyze them at a certified water laboratory to determine what water quality issues, if any, need to be addressed on site. This laboratory analysis would include water collected by drone and by hand with a bottle. Analysis would cover nutrients, metals, common chemical pollutants, fecal coliform, and more. Field staff will collect three samples per year at ten sites across the STAF. This will be repeated over two field seasons, for a total of 60 field samples.

## Goals

The goal of the Snoqualmie Tribe Ancestral Forest-Data Driven Headwater Management project is to create new data sources and tools to help the Snoqualmie Tribe take immediate action to protect water resources and improve water quality and quantity in the headwaters of the North Fork Tolt. The result of these efforts is a watershed that has improved resiliency to the effects of climate change, improved habitat, and allows for Snoqualmie Tribe's cultural uses. Outcomes of this project will include:

- A VELMA model that is tailored to the STAF portion of the North Fork Tolt, to determine what buffer widths are most protective of water quality and quantity in the river and its tributaries.
- A GIS map of all wetlands in the STAF, that will be used immediately to map areas that are required for protection from timber practices through buffer creations.
- Water quality and quantity data that feeds into the modeling and mapping tools above, and will highlight areas that need additional protections or restoration.
- Water quantity/quality benefits to the Tolt and Snoqualmie River watersheds through improved land management practices.

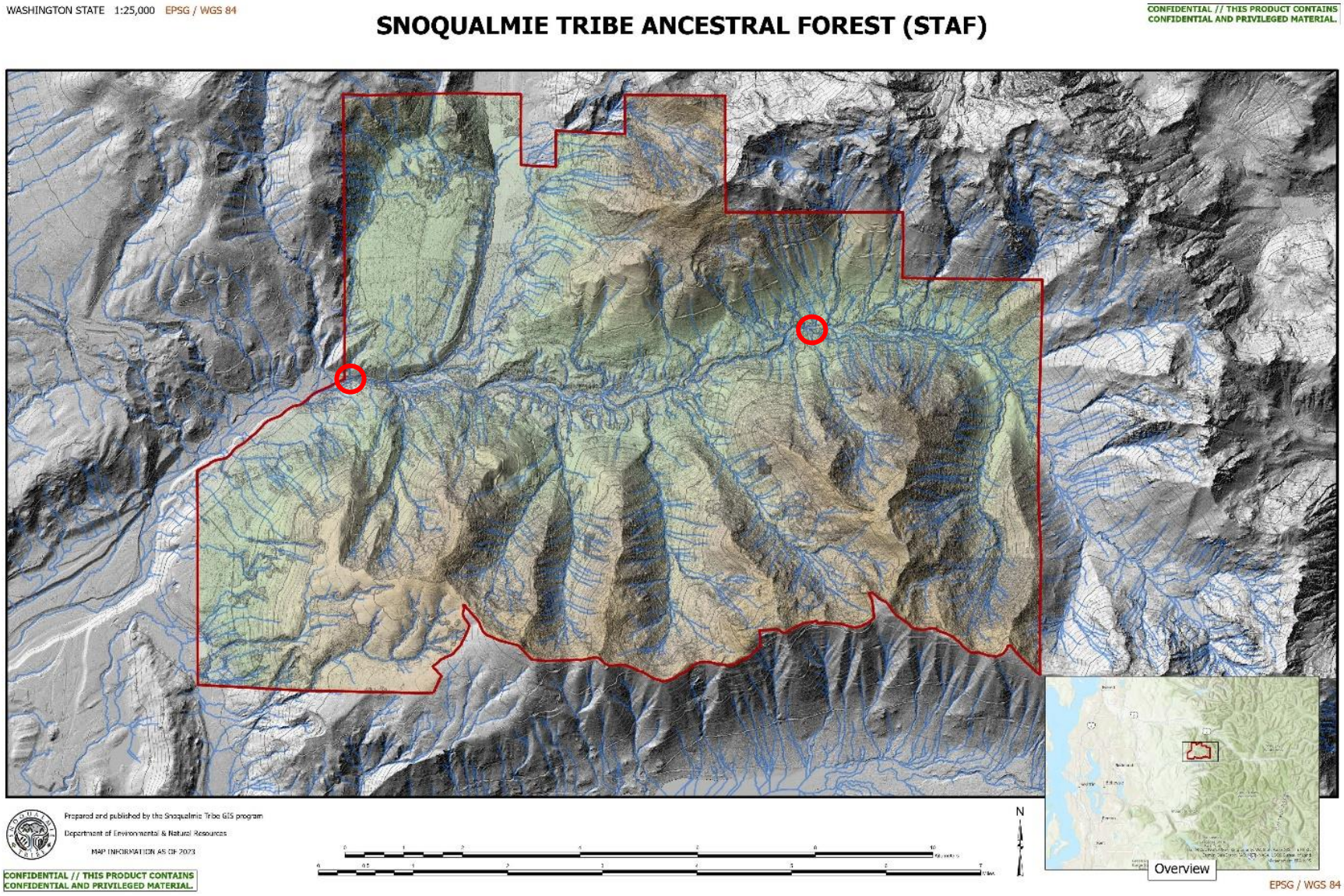


Figure 2. Map of STAF with waterways. The two proposed stream gauge locations are marked with red circle.

## Project Location

The project will take place in the Snoqualmie Tribe Ancestral Forest, located in northeast King County, north of the South Fork Tolt Reservoir. See Figure 3 for location information.

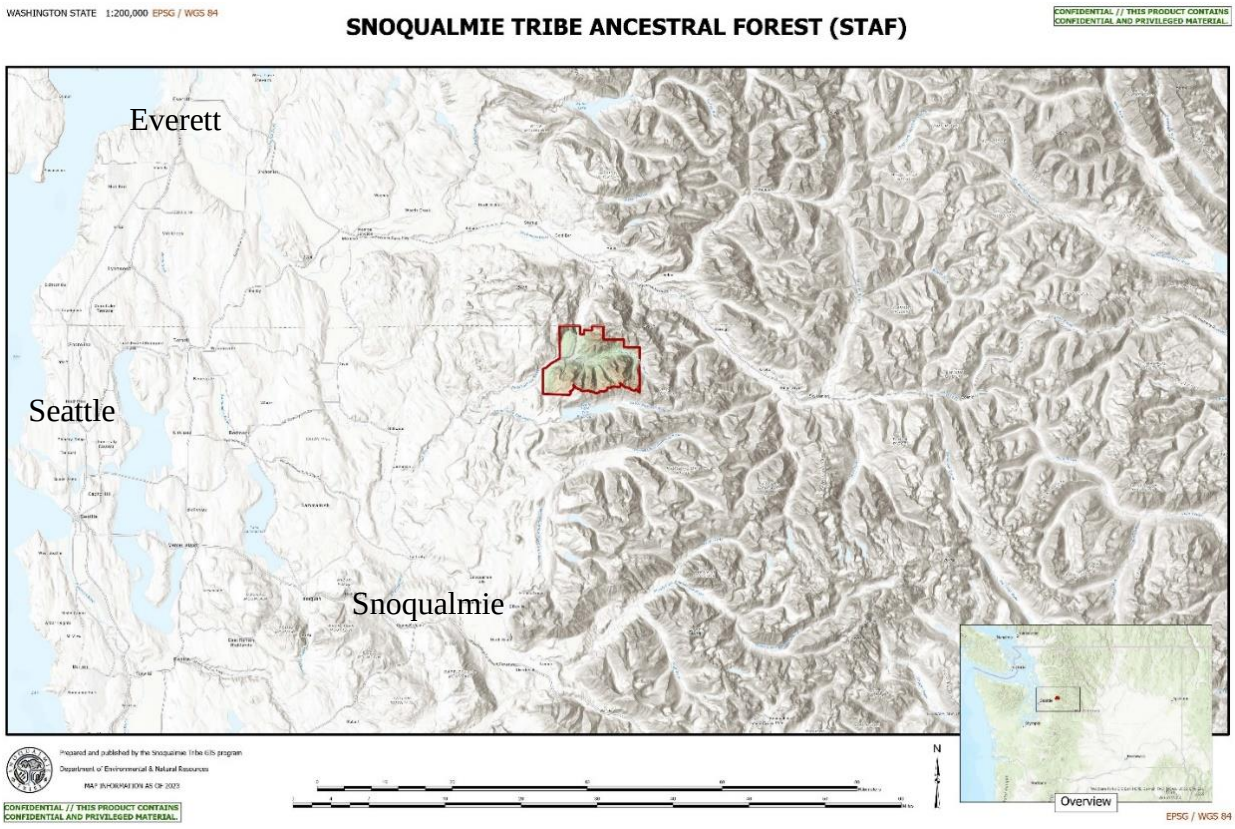


Figure 3. Area view of the STAF. The site is located in the foothills of the Cascade Mountain range, east of the Puget Sound.

## Data Management Practices

All data collected will be uploaded to the Snoqualmie Tribe's ArcGIS Online account and compatible with GIS analysis. The databases produced through this grant will be hosted on ArcGIS Online, including mapping, data analysis, and modeling that will be used immediately in management decisions. Data will use industry standard formats.

## Evaluation Criteria

### Evaluation Criterion A—Water Management Challenge(s)

*1. Describe the water management challenge(s). Describe in detail the **water management challenge** is occurring within your project area. Describe the severity of the challenge to be addressed with supporting details. For example, will your project address water supply*

*shortfalls or uncertainties, the need to meet competing demands for water and the lack of reliable water supplies for municipal, agricultural, tribal, environmental or recreational water uses, complications arising from drought, conflicts over water, or other water management issues?*

There is not enough water in the Snoqualmie Watershed. Not enough water for fish, for wildlife, or for people. The Snoqualmie Tribe has used the waters of the Snoqualmie Watershed for subsistence and cultural practices since time immemorial. This project will produce tools that will immediately result in management actions to increase water resource resiliency in the upper watershed of the North Fork Tolt, which will positively impact water quality and summer water quantity flows in the greater Snoqualmie Watershed.

*2. Describe the **concerns or outcomes** if this water management challenge is not addressed?*

If this water quantity and quality management challenge is not addressed, ESA listed Chinook and steelhead trout populations (in addition to all native coldwater fishes) will be negatively affected, discussions around water rights will become even more strained, and the people of Snoqualmie Tribe will not be able to continue practicing their lifeways which helps to sustain their well-being.

*3. Explain **how** your project will address the water management issues identified in your response to the preceding bullets and provide support for your response. For example, will your project improve water management by supporting:*

*a. water supply reliability for municipal, agricultural, tribal, environmental or recreational water uses,*
*b. management of water deliveries,*
*c. water marketing activities,*
*d. drought management activities,*
*e. conjunctive use of ground and surface water,*
*f. water rights administration,*
*g. ability to meet endangered species requirements,*
*h. watershed health,*
*i. Restore a natural feature or use a nature-based feature to reduce water supply and demand imbalances, the risk of drought or flood, or to increase water supply reliability for ecological values,*
*j. conservation and efficiency, or*
*k. other improvements to water supply reliability?*

*In your response, be sure to explain how your project will improve any of the above.*

This project proposal addresses points a, d, g, h, i and j. When we achieve our goal of collecting baseline water quality and summer water quantity flow data in the STAF, in addition to wetland

mapping and land use modeling, we will be able to identify immediate management actions that will improve water quality. Recent studies show that Douglas fir timber plantations can have a significant impact on water quantity, and by changing harvest practices, thinning for forest health instead of commercial benefit, and replanting at multiple decades the Tribe can benefit in-stream flows (Jones and Perry 2017). This will have ripple effects downstream of the site, impacting water quality and summer water quantity flows in the lower Snoqualmie watershed. Our vision for a healthier watershed will improve environmental and tribal uses and help restore overall watershed health. Increased summer water quantity flows in the upper watershed will improve the basin's drought resiliency, put more water in the streams for endangered species like Chinook salmon and steelhead trout, and increase water supply reliability for ecological values.

## Evaluation Criterion B—Project Benefits

*1. Describe how the **need for the project** was identified. Was the proposed project identified using a collaborative process with input from multiple and diverse stakeholders?*

The need for this project was identified by the Snoqualmie Tribe in partnership with the Snoqualmie Watershed Forum. The Snoqualmie Watershed Forum is comprised of elected official and citizen representatives from throughout the Snoqualmie Watershed. The Forum helps to coordinate the actions of local governments on fish habitat, flooding, water quality issues in the Snoqualmie Watershed. The Forum also helps coordinate local participation in developing a salmon conservation plan for the Snohomish River Basin. Projects like this one were identified in the Tribe's own work on watershed health and have come out of recommendations from previous work completed by the Snoqualmie Watershed Forum. The Snoqualmie Watershed Water Quality Synthesis Report (2009), authored by staff at the Snoqualmie Watershed Forum, specifically calls out landowners of forest and timber lands. From the section on the Tolt watershed: "While water quality in the Tolt sub-basin is generally very good, high water temperature in late summer and early fall is a concern. In the North and South Forks, temperature does not appear to reach levels that are of acute concern for fish or other organisms, but the spawning suitability of those areas for char and other cold-water salmonids may be compromised. Perhaps more importantly, temperature in the Lower Tolt is profoundly affected by the temperature in each of the forks. Thus, efforts to address temperature impairment in the headwaters – primarily via improved logging practices and restoration – should be strongly encouraged" (Kanje 2009). This report focuses on current conditions and does not go into detail on the effects of climate change. It is imperative that the Tolt watershed remains in good health and supports cold-water salmonids even as higher temperatures and low summer flows are beginning to impact these culturally and economically important species. In the Snohomish River Basin Salmon Conservation Plan (2005), headwater protection through sustainable forestry and protecting forest lands from conversion to other uses are included in the guidance. This is the work that the Snoqualmie Tribe plans to undertake as a forestry landowner, and the data collected from this project will support these actions.

*2. Describe **how** the tool, method, or information will be applied and **when** will it be applied.*

*• Will the tool or information be used immediately or will additional work need to be done before the tool will be used?*

The data collected from these projects will be used immediately to inform management practices. The Environmental and Natural Resources Department works closely with both the Government Affairs and Special Projects Department (GASP) and Tribal Council to make management recommendations for the STAF and will use the data collected to choose which actions to take to best protect and enhance water quality. The VELMA model will help us determine what buffer widths to impose on timber harvests around streams at STAF, and can be incorporated into the next Forest Practice Application (FPA) following the completion of the model. This is true for the wetlands map as well, the creation of a detailed mapping tool that pinpoints wetlands of all sizes can improve our timber practice buffers by the next FPA. When the Tribe is able to determine if there are "hot spots" for both water temperature and water pollution through the creation of the water quality database, the Tribe can target areas for restorative thinning or "no-go" areas for timber production. These interpretations from the data will need a short time to be analyzed but can be incorporated into the next available FPA.

*3. Describe, in detail, the extent of benefits that can be expected to occur upon implementation of the project, and provide support for your responses.*

*• Who will use the tool or data developed under this proposal and **how** will they benefit from the project? Support could include but is not limited to letters from stakeholders expressing support for the project and explaining how they will benefit.*
*• How will the project improve **water management decisions**?*
*• Describe if the results of your project will be **applicable elsewhere**. What additional work would need to be done to make the project results transferable to others?*
*• To what extent will the project address the water management challenges described in E.1.1.?*

The Snoqualmie Tribe will utilize the data developed under this proposal and will benefit from this project by using the data created to help inform forest management decisions. The entire watershed will benefit from sustainable and water-focused management in the upper watershed. The data collected will be used to inform forest management decisions that benefit water quality and quantity the most, and where the Tribe can strategically avoid impacts for the greatest benefit. Information transfer will occur internally within the Snoqualmie Tribe, and recommendations from this project will be shared with Tribal Leadership. This project cannot resolve all the issues our watershed faces with a limited water supply, but the Tribe will be taking a step in the right direction by protecting and enhancing the upper watershed. This will result in cleaner and more abundant water in the lower watershed where the need for fish, wildlife, and people is pressing.

*4. Explain how your project complements other similar efforts in the area where the project is located. Will your project complement or add value to other, similar efforts in the area, rather than duplicate or complicate those efforts? Are there other similar efforts in the area that have used a similar methodology successfully which can be complimented? Applicants should make a reasonable effort to explore and briefly describe related ongoing projects. Consider efforts by any Federal, state, local agency, or non-governmental organizations.*

The Snoqualmie Tribe has already demonstrated leadership in managing the upper watershed in a sustainable way through holistic watershed planning. Part of that plan includes past research, where the Snoqualmie Tribe partnered with scientists from NOAA and Pacific Northwest National Laboratory to author a white paper on the benefits of riparian restoration on yearling salmonids (Fullerton et al. 2022). The Tribe has used funds from King County CWM and OSRC grants to collect initial data on water temperature, instream habitat structure, and aquatic wildlife health and abundance at the STAF. This project proposal compliments but does not duplicate those efforts, and enhances the work already being done by creating tools and datasets that can be utilized quickly to impact forestry practices to benefit water quality and quantity.

## Evaluation Criterion C—Project Implementation

*Describe your project implementation plan:*

*1. Briefly describe and provide support for the approach and methodology that will be used to meet the objectives of the project. You do not need to repeat the full technical project description included in Section D.2.2.4 under the Technical Project Description. However, you should provide support for your chosen methodology, including use of any specific models, data, or tools.*

Stream gauges, laboratory analysis for water quality, and database creation in an online cloud application are all commonly accepted and widely used methods for collecting, storing, and analyzing water related data. Drone based water collection is a newer technology but is not a complicated idea and has been field tested extensively. Using thermal imagery drone flights to identify wetlands is also a proven method and will improve the data layers the Tribe already has access to which are lacking in the level of detail required to pinpoint smaller wetlands. The VELMA model was developed by the EPA and has proven to be an insightful modeling tool for determining how landscape changes impact water quality and quantity. The Tribe will be using this model for testing different buffer widths, timber harvesting rotations, and when it becomes publicly available, snowpack modeling.

*2. Describe the work plan for implementing the proposed scope of work. Such plans may include, but are not limited to:*
*a. an estimated project schedule that shows the stages and duration of the proposed work,*
*b. milestones for each major task,*
*c. start and end dates for each task and milestones, and*

*d. costs for each task*

Table 1. Work plan for the project proposal, including tasks, milestones, timelines, and costs.

| Tasks | Milestones | Timeline | Costs |
|---|---|---|---|
| **Drone based water collection** | Purchase of drone with water bottle attachment for remote sampling | July 2024-August 2024 | $34,400 |
| | Collection at multiple sites over the course of 2-3 field seasons | August 2024-September 2026 | $32,000 |
| **Wetland mapping with thermal imagery** | Purchase of drone and thermal imagery extension | July 2024-August 2024 | $20,000 |
| | Drone flight of areas of interest for wetlands protection (1.5 field seasons) | July 2024-September 2026 | $32,000 |
| **VELMA model** | Development of VELMA modeling tool for STAF | July 2024-September 2026 | $50,000 |
| **Installing stream gauges and developing a database for flow data** | Stream gauge purchase and installation by contractor- completed in first field season | July 2024-October 2024 | $60,000 |
| | Creation of database connected via satellite to stream gauges for real-time data reading and data storage | October 2024-May 2025 | $80,000 |
| **Developing a database for temperature logger data** | Creation of database for temperature logger data | July 2024-October 2025 | $31,600 |
| **Laboratory analysis of water samples** | Collection and analysis of water | July 2024-September 2026 | $60,000 |

| | | | |
|---|---|---|---|
| | samples through contracted services | | |

*3. Provide a summary description of the products that are anticipated to result from the project. These may include data, metadata, digital or electronic products, reports, and publications. Note: using a table to list anticipated products is suggested.*

Table 2. Project deliverables and the products associated with each deliverable.

| **Tasks** | **Products** |
|---|---|
| **Drone based water collection** | • Additional sites for laboratory analysis in remote locations otherwise unattainable |
| **Wetland mapping with thermal imagery** | • ArcGIS data layer with wetland boundaries and buffer recommendations |
| **VELMA model** | • VELMA model tool |
| **Installing stream gauges and developing a database for flow data** | • Creation of a stream gauge database<br>• Stream gauge data uploaded to an online ArcGIS database<br>• Incorporation of flow data into VELMA model |
| **Developing a database for temperature logger data** | • Temperature data uploaded to an online ArcGIS database |
| **Laboratory analysis of water samples** | • Creation of a water quality database<br>• Water quality analysis data uploaded to an online ArcGIS database |

*4. Who will be involved in the project as project partners? What will each partner or stakeholder's role in the project be? How will project partners and stakeholder be engaged in the project and at what stages? If you are a Category B applicant, be sure to explain how your Category A partners will be engaged in the project.*

The Snoqualmie Tribe will collect the data, create the models, house the databases, and update forest management practices independently. However, the Tribe plans to share process information with key partners in the watershed, primarily the Snoqualmie Watershed Forum (Forum). The Forum has provided a letter of support to the tribe to explain the relationship between the work that the Snoqualmie Tribe does and the work that the Forum does to benefit

the Snoqualmie Watershed. The Forum directed funds to the Tribe that were awarded by the King County Flood Control District through the Cooperative Watershed Management grant, which will be used as match for this proposal. In addition, King County also provided matching funds through the Open Space—Riparian Corridor grant (please see letters of support/funding).

*5. Identify staff with appropriate credentials and experience and describe their qualifications. Describe the process and criteria that will be used to select appropriate staff members for any positions that have not yet been filled. Describe any plans to request additional technical assistance from Reclamation or via a contract. Please answer the following:*

*a. Have the project team members accomplished projects similar in scope to the proposed project in the past either as a lead or team member?*

*b. Is the project team capable of proceeding with tasks within the proposed project immediately upon entering into a financial assistance agreement? If not, please explain the reason for any anticipated delay.*

Cindy Spiry has worked for the Snoqualmie Tribe for over 15 years and has extensive knowledge and experience in overseeing the Tribe's environmental outreach initiatives and environmental programs. She has a Bachelor degree in Ecology and Conservation, and a Certificate in Restoration Ecology, both from the University of Washington. She has received extensive training on many environmental topics and represents the Snoqualmie Tribe on local and regional boards and committees, such as the King County Fish Farm Flood Committee, the King County Rural Forest Commission, and the Tribal Solid Waste Advisory Network. She has been involved with restoring salmon habitat in Western Washington for 22 years and has 19 years of successful grant management.

Kelsey Payne has worked for the Snoqualmie Tribe as the Water Quality Program Manager for over three years. She has a Bachelor of Science in environmental science from Western Washington University and a Master of Science in restoration ecology from the University of Washington. Kelsey has 10 years of experience in both field and data management work related to water quality and riparian restoration. She is currently managing a Bureau of Reclamation grant to improve water quality on the Snoqualmie Reservation through the installation of a floating treatment wetland.

Andrew McAninch is the GIS Program Manager and has been with the Tribe since 2018. He has a Bachelor of Arts in Biology and a Master of Science in Geography with a specialization in Geographic Information Science. He has over 15 years of professional experience using GIS in an environmental/natural resource context. He has a wide variety of experience in GIS management, data collection design and development, cartography and web mapping, coding, and analysis. His areas of specialization include hydrology, terrain analysis, remote sensing, and photogrammetry.

Josh Fackrell is the Tribe's GIS Analyst and a Snoqualmie Tribal Member. In his role for the Tribe, he performs complex GIS data manipulation, analysis, extraction, and generation of data collection portals for the Tribe. Josh brings 23 years of GIS experience to the team with certifications from the National Geospatial-Intelligence Agency (NGA) and various governmental entities. He is honorably retired from the U.S. Army after completing 20 years of service in the Military Intelligence field. He has an extensive background in remote sensing that includes processing, exploitation, and disseminating of raw and final geospatial data-driven products. He has years of experience in task organizing Unmanned Aerial Systems (UAS) and program management of field data collection assets. Josh has direct experience collecting field water datasets and mapping hydrological geospatial features utilizing multiple GIS tools and techniques.

The team at the Snoqualmie Tribe Environmental and Natural Resources Department is ready to begin tasks related to the project immediately upon funding.

## Evaluation Criterion D—Dissemination of Results

*Explain how project results will be disseminated, including:*

*Describe how the tools, frameworks, or analyses developed under the proposed scope of work will be disseminated, communicated, or made available to water resources managers who may be interested in the results.*
*• If the applicant is the primary beneficiary of the project, explain how the project results will be communicated internally, and to interested stakeholders and interested water resources managers in the area, if appropriate.*
*• If the applicant is not the primary beneficiary of the project (e.g., universities or research institutes), describe how project results will be communicated to project partners and interested water resources managers in the area.*
*• Describe how the project results will be shared with other water managers in the West that could use the information to support water management objectives.*

The Snoqualmie Tribe will be the primary beneficiary of the project, and the owner of all the data collected through this project. The project results will be communicated within the Tribe to immediately inform FPA workplans in development, which will determine buffer widths and timing of timber harvest/thinning harvest within a calendar year. While sensitive information, like the location of wetlands, will remain confidential within Tribal government, other aspects of the project like sampling techniques, database creation/modeling process, and takeaways from data analysis will be shared with our partners at the Snoqualmie Watershed Forum.

## Evaluation Criterion E—Presidential and Department of the Interior Priorities

• ***Climate Change****: E.O. 14008 emphasizes the need to prioritize and take robust actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; and conserve our lands, waters, oceans, and biodiversity.*

○ *If applicable, describe how the project addresses climate change and increases resiliency. For example, does the project help communities respond to or recover from drought or reduce flood risk?*

Water-focused forest management in the upper watershed will have downstream benefits for both the Tolt and Snoqualmie watersheds. These watersheds are already impacted by climate change, and summer low flows and elevated temperatures continue to be a concern for salmonid species, as well as recreational and cultural uses. Understanding how we can manage forests to better support instream flows and water quality will help our watershed be more resilient to the effects of climate change. Higher summer flows in the upper watershed will impact flows in the Snoqualmie watershed, increasing drought resiliency for both people and wildlife.

○ *How will the project build long-term resilience to drought? How many years will the project continue to provide benefits? Please estimate the extent to which the project will build resilience to drought and provide support for your estimate.*

While it is difficult to quantify the amount of water that may be added to the watershed based on forest management practices, there is a body of evidence that suggests that sustainable forest management can have meaningful benefits to increase water quantity and quality, which will improve overall watershed resiliency to drought. A recent publication from McNulty et. al. explains the relationship of forests and water. "Healthy, well-managed forests also store and filter water as well as reduce surface runoff and flood risk" (McNulty et. al. 2021). The publication goes on to say, "Forest managers need to achieve a balance between optimizing water yield and keeping sufficient canopy to minimize soil erosion, maintain albedo (i.e. the proportion of incident light or radiation reflected from a surface) and promote water quality. Competing trade-offs between water and non-water natural resource demands from forests is a major forest management challenge" (McNulty et. al. 2021). This is a challenge that the Snoqualmie Tribe is ready to take on, and we are confident that a water-focused management approach that increases summer flows and protects water quality is feasible through data driven management for long term water protection.

○ *Will the proposed project reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees, and other vegetation? Does the proposed project seek to reduce or mitigate climate pollutions such as air or water pollution? Does the proposed project contribute to climate change resiliency in other ways not described above?*

Informing forest management practices for water quality and summer water quantity flow considerations may have additional carbon sequestering benefits, but the main benefits from this project are to target and reduce areas of water pollution and to improve watershed resiliency to climate change by protecting and sustainably managing a large forest acreage in the upper watershed.

• ***Disadvantaged or Underserved Communities****: E.O. 14008 and E.O. 13985 affirm the advancement of environmental justice and equity for all through the development and funding of programs to invest in disadvantaged or underserved communities.*

- *Please use the Council on Environmental Quality's interactive Climate and Economic Justice Screening Tool, available online at Explore the map - Climate & Economic Justice Screening Tool (geoplatform.gov) to identify any disadvantaged communities that will benefit from your project.*
- *If applicable, describe how the project benefits those disadvantaged or underserved communities identified using the tool. For example, does the project increase reliability of water supplies, improve water quality, provide economic growth opportunities, improve, or expand public access to natural areas or recreation, or provide other benefits in a disadvantaged or underserved community?*

The Snoqualmie Tribe, according to the Climate and Economic Justice Screening Tool, qualifies as an underserved and disadvantaged community. This project would serve the Snoqualmie Tribe by allowing the Tribe to manage forest lands in a way that focuses on overall watershed health and maximizes benefits to downstream areas that are culturally significant to the Tribe.

• ***Tribal Benefits:*** *The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum, Tribal Consultation and Strengthening Nation-to Nation Relationships, asserts the importance of honoring the Federal government's commitments to Tribal Nations.*

This project allows the Snoqualmie Tribe, a federally recognized tribe, to protect and preserve the ancestral homelands of the Snoqualmie people. Not just the 12,000 acres of the Snoqualmie Tribe Ancestral Forest, but the Tolt and Snoqualmie watersheds as well. Sovereignty over water resources and protections of water to benefit the Snoqualmie people and the wildlife that call the Snoqualmie watershed home is a priority of the Snoqualmie Tribe.

## Project Budget

Table 3. Project budget with cost breakdowns.

| Budget Item Description | Computation | | Quantity Type | Total Cost |
|---|---|---|---|---|
| | $/Unit | Quantity | | |
| **Personnel** | | | | |
| ENR Director | 63.87 | 300 | hours | $19,161 |
| Water Quality Manager | 49.61 | 600 | hours | $29,766 |
| GIS Manager | 47.66 | 1800 | hours | $85,788 |
| GIS Analyst | 36.87 | 900 | hours | $33,183 |
| Field Staff | 29 | 600 | hours | $17,400 |
| | | | **Personnel Subtotal** | **$185,298** |
| **Fringe** | | | | |
| Fringe benefits calculated @ 35% of salaries and wage (Retirement, Health Care, Annual and Sick Leave, Life Insurance, FICA) | 0.35 | 4,200 | hours | $64,854 |
| | | | **Fringe Subtotal** | **$64,854** |
| Travel | | | | |
| **Mileage** | 0.65 | 3446 | miles | $2,240 |
| | | | **Travel Subtotal** | **$2,240** |
| **Equipment** | | | | |
| Server | $18,000 | 1 | Unit | $18,000 |
| Drone | $22,200 | 1 | Unit | $22,200 |
| Multi-spectral camera | $20,000 | 1 | Unit | $20,000 |
| Water sampler | $12,200 | 1 | Unit | $12,200 |
| Stream gauge | $10,629 | 2 | Unit | $21,258 |
| | | | **Equipment Subtotal** | **$93,658** |
| **Supplies** | | | | |
| **Miscellaneous supplies** | $1,000 | 1 | Unit | $1,000 |
| | | | **Supplies Subtotal** | **$1,000** |
| **Contractual** | | | | |
| Stream gauge installation | $8,475 | 2 | N/A | $16,950 |
| Water quality laboratory analysis | $600 | 60 | Sample | $36,000 |
| | | | **Contractual Subtotal** | **$52,950** |
| | | | **Total** | **$400,000** |

**Personnel** covers time for key staff to participate in this project and is based on current salaries for staff. Key staff include the Environmental and Natural Resources Director who will administer the grant, the Water Quality Manager who will manage the project deliverables of the grant, the GIS Manager who will build the databases and perform VELMA modeling, and the GIS Analyst that will assist the GIS Manager. Field staff include multiple staff members at the Snoqualmie Indian Tribe that are available to participate in project work.

**Fringe Benefits** are calculated as 35% of the total personnel time, and includes coverage for benefits such as retirement, healthcare, annual and sick leave, life insurance, and FICA.

**Travel** will cover reimbursement for vehicle mileage to and from the STAF for drone flights, stream gauge installation, water sample collections, etc. Mileage reimbursement is calculated at the approved federal rate.

**Equipment** includes all one-time purchases of equipment in support of this project. The price for the drone, water sampler, multi-spectral camera, and server were all verified within 30 days of the grant submission date. The price for the stream gauge was quoted from a reputable consultant that was recommended to the Tribe by USGS staff working in a local office branch.

**Supplies** will cover all the miscellaneous items that come with fieldwork. Temperature loggers may need replacement cable, bottles break and need to be replaced, or a part from the stream gauge breaks and needs replacement. This part of the budget allows us to respond to small fixes and upkeep of equipment.

**Contractual** includes both the contracts for stream gauge installation and water quality laboratory analysis. Prices for stream gauge installation was quoted from a reputable consultant that was recommended by USGS staff. Prices for water sample analysis are based on the Tribe's current contract with a local water quality analysis laboratory, accounting for 5% yearly cost increases.

Table 4. Category project breakdowns and matching funding from non-federal entities.

| **Budget Object Category** | **Total Cost** | | |
|---|---|---|---|
| **a. Personnel** | **$185,298** | | |
| **b. Fringe Benefits** | **$64,854** | | |
| **c. Travel** | **$2,240** | | |
| **d. Equipment** | **$93,658** | | |
| **e. Supplies** | **$1,000** | | |
| **f. Contractual** | **$52,950** | | |
| **g. Construction** | **$0** | | |
| **h. Other Direct Costs** | **$0** | | |
| **i. Total Direct Costs** | **$400,000** | **Federal Estimated Amount** | **Non-Federal Estimated Amount** |

| | | | |
|---|---|---|---|
| **i. Indirect Charges** | **$0** | | |
| **Total Costs** | **$400,000** | **$400,000** | **$310,992** |
| **Cost Share Percentage** | | **56%** | **44%** |

| Table 5.—Summary of Non-Federal and Federal Funding Sources | |
|---|---|
| **FUNDING SOURCES** | **AMOUNT** |
| **Non-Federal Entities** | |
| 1. Open Space–River Corridors (OSRC) Grant – King County | $ 250,992 |
| 2. Cooperative Watershed Management (CWM) Grant– King County Flood Control District awarded through Snoqualmie Watershed Forum | $ 60,000 |
| **Non-Federal Subtotal** | **$ 310,992** |
| **REQUESTED RECLAMATION FUNDING** | **$ 400,000** |

## Literature Cited


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# SNOQUALMIE INDIAN TRIBE
# RESOLUTION #249-2023

**Resolution Approving FY2024 Application for Bureau of Reclamation WaterSMART Grant**

WHEREAS, the Snoqualmie Indian Tribe is a sovereign entity recognized as a signatory Tribe to the Point Elliott Treaty of 1855; and

WHEREAS, the Snoqualmie Tribal Council is the governing body of the Snoqualmie Indian Tribe by the authority of its Constitution; and

WHEREAS, the Snoqualmie Tribal Council is the duly elected council of the General Membership and is responsible for the protection of the health, safety, and welfare of the members of the Snoqualmie Indian Tribe; and

WHEREAS, the Snoqualmie Tribal Council has the authority to regulate its own affairs per the Constitution of the Snoqualmie Tribe of Indians; and

WHEREAS, the Snoqualmie Tribe supports the continuation of the Tribe's Environmental & Natural Resources Department ("ENR") work in water quality and quantity in the upper watershed of the North Fork Tolt River; and

WHEREAS, the ENR Director wishes to submit an application to the FY24 Bureau of Reclamation WaterSMART Grant program ("Grant"); and

WHEREAS, the Grant is for up to $400,000 USD, for a two-year period, with a 25% matching fund requirement to come from the North Fork Tolt River Assessment (Code 518) and the King County Open Space River Corridor Program - North Fork Tolt (code 530); and

WHEREAS, the Grant funds will be used for the Snoqualmie Tribe Ancestral Forest—Data Driven Headwaters Management project, and it will take place between April 1, 2024 through September 30, 2026; and

NOW, THEREFORE BE IT RESOLVED, the Snoqualmie Tribal Council hereby authorizes the ENR Director to submit the grant application for the Bureau of Reclamation WaterSMART Grant Program for an amount up to $400,000 USD, authorizes the Tribal Chairman to sign the grant agreement after legal review, and designates the ENR Director with the oversight and responsibility for managing grant funds, coordinating activities and deliverables pertaining to the Grant, and signing any no-cost extensions; and

NOW, THEREFORE BE IT FINALLY RESOLVED, the Snoqualmie Tribal Council directs the Finance Department to issue payments in accordance with the grant agreement.

# SNOQUALMIE INDIAN TRIBE
# RESOLUTION #249-2023

**Resolution Approving FY2024 Application for Bureau of Reclamation WaterSMART Grant**

**CERTIFICATION**

Voted on this 12th day of October 2023, at a duly called Zoom Meeting of the Snoqualmie Tribal Council with a quorum present and voting.

Vice Chairman, Steve De Los Angeles For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Tribal Treasurer, Joshua Gabel For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Tribal Secretary, Shauna Shipp-Martinez For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Suzanne Sailto For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Christina Sparling For ____, Against ____, Abstaining ____,
**PTO**/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Bill Sweet For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Jim Sweet For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Jolene Williams For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped Out

Council Member, Angela Young For __X__, Against ____, Abstaining ____,
PTO/Absent/Absent Excused/Approved Tribal Business/Stepped

Out For ___8____, Against ____0____, Abstaining ____0____.

Robert M. de los Angeles, Tribal Chairman

Shauna Shipp-Martinez, Tribal Secretary

King County
**Department of Natural Resources and Parks**
Warren Jimenez
Director, Parks & Recreation Division
King Street Center
201 S. Jackson St, Suite 5702
Seattle, WA 98104-3855

September 22, 2023

Dear Bureau of Reclamation Reviewers,

King County Parks is pleased to provide a letter of support and matching funds to the Snoqualmie Tribe's *Snoqualmie Tribe Ancestral Forest—Data Driven Headwaters Management* grant application to the WaterSMART Applied Science funding program. We have provided funding for the Tribe's baseline water quality and instream habitat assessment in the North Fork Tolt, and we hope that the Bureau of Reclamation will consider the commitment made to enhance water quality and improve habitat for fish and wildlife in the upper watershed. These upper watershed management decisions have implications for the health of the entire watershed, and collecting data to inform best management practices is the first step in watershed stewardship. Please find the information for these matching funds below:

**Name of Grant:** North Fork Tolt River Assessment
**Grant Term:** 08/2022 – 11/2025
**Funds Awarded:** $250,992

King County Parks appreciates the Snoqualmie Tribe's commitment and support in protecting and conserving open spaces and natural resources throughout the County. We support the Tribe's application for additional funding to further this important work.

Please feel free to contact me with any questions about our partnership with the Snoqualmie Tribe or the Parks grant award.

Sincerely,

Warren Jimenez
Director, Parks and Recreation Division
King County Department of Natural Resources and Parks
206.477.4525
wjimenez@kingcounty.gov

Working together for salmon recovery and watershed health.

Carnation

Duvall

King County

North Bend

Skykomish

Snoqualmie

Snoqualmie Tribe

Tulalip Tribes

# SNOQUALMIE WATERSHED FORUM


October 10, 2023

Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

Dear WaterSMART Proposal Reviewers:

The Snoqualmie Watershed Forum (Forum) is pleased to provide this letter of support and statement of matching funds for the Snoqualmie Indian Tribe's WaterSMART proposal: *Snoqualmie Tribe Ancestral Forest – Data Driven Headwaters Management* (the Project). The Forum is a partnership of elected officials, citizens and representatives from conservation organizations supporting salmon recovery and ecological health in the Snoqualmie and South Fork Skykomish Watersheds (spanning the King County portion of Water Resource Inventory Area 7). Member governments include King County, the Snoqualmie Tribe, Tulalip Tribes, the cities of Duvall, Carnation, North Bend and Snoqualmie, and the Town of Skykomish.

The proposed Project will allow the Snoqualmie Tribe to collect and track information about water quality, water temperature, and wetlands in a remote headwater area of the Tolt River watershed in order to establish appropriate buffers during logging and prioritize restoration efforts. The Tolt River is a major tributary to the Snoqualmie River, and the basin supports a rare population of summer steelhead, as well as Chinook, coho, and other salmonids. Actions to protect and restore Tolt River habitat are a priority for the Forum.

Addressing water quality problems such as elevated water temperatures in the Snoqualmie River is a high-priority concern for the Forum. The Snoqualmie River is currently listed as impaired by the Washington State Department of Ecology. Water temperature problems are exacerbated by the combination of decreasing flows and increasing summer temperatures due to the impacts of climate change, further jeopardizing the recovery of salmonids in the watershed. Accordingly, the Forum is grateful that the Snoqualmie Tribe is seeking to measure and track water quality through rigorous monitoring to develop solutions.

Serving as **matching funds**, the Forum approved baseline water quality and an instream habitat assessment in the North Fork Tolt through the Cooperative Watershed Management program, funded by the King County Flood Control District:

Name of grant: North Fork Tolt River Assessment
Grant period: August 2022 – October 2025
Funds granted: $60,000

The importance of this project is supported by numerous multi-partner plans for protecting and restoring watershed health, including:

- This project will help address a range of priority ecological actions identified in the *Snohomish River Basin Salmon Conservation Plan*, including restoring wetland functions and protecting water quality (Plan page 11-84 & 11-86, 2005).
- This project will help address concerns identified in the *Snoqualmie Watershed Water Quality Synthesis Report*, including concerns related to water temperature and nutrient loadings.
- Finally, the basin's *Climate Change Impacts to Salmon Issue Paper* specifically highlights protecting cool headwater streams and natural processes as a key strategy for addressing basin-wide climate change impacts.

For many years now, the Forum and the Snoqualmie Tribe have worked together to restore the Snoqualmie and South Fork Skykomish basins within the Snohomish River watershed. The Forum supports this grant proposal and encourages the Bureau to award the requested funding. If you have any questions, please contact Erin Ryan-Penuela, WRIA 7 Project Coordinator at eryan@kingcounty.gov or (206) 477-5284. Thank you for your consideration.

Sincerely,

Henry Sladek, Forum Chair
Mayor, Town of Skykomish

Ryan Miller, Forum Vice-Chair
Tulalip Tribes, Director, Treaty Rights and Government Affairs

cc: Snoqualmie Watershed Forum
Elissa Ostergaard, Snoqualmie Salmon Recovery Manager