



**NOOKSACK INDIAN TRIBE
NATURAL RESOURCES DEPARTMENT
REQUEST FOR PROPOSALS**

RFP Issue Date: 3/6/12
Proposal Due Date: 3/20/12
Notification of Selection: 3/27/12

Note: This Request for Proposals is open to all interested parties, including federal agencies.

CHARACTERIZATION OF GROUNDWATER PROCESSES IN THE SOUTH FORK NOOKSACK RIVER

The Nooksack Indian Tribe Natural Resources Department is seeking proposals from interested parties for a study to investigate groundwater-surface water interactions in the South Fork Nooksack River watershed.

Introduction

One of the primary goals of the Nooksack Tribe Natural Resources Department is to protect and recover Nooksack salmon populations to levels that provide sustainable, meaningful harvest. The Department is actively engaged in salmon recovery planning, fisheries management, habitat restoration, resource protection, and monitoring throughout the Nooksack River watershed and adjacent estuarine and nearshore marine areas. Salmon recovery efforts are focused on the two independent spring chinook populations in the Nooksack watershed: North Fork/Middle Fork Nooksack spring chinook and South Fork Nooksack spring/summer chinook. Natural-origin escapements are critically low, and hatchery population rebuilding programs are being implemented for both populations while habitat restoration efforts restore the natural productivity of the system.

In the South Fork Nooksack River, spring/summer chinook productivity is limited by low habitat diversity, high water temperatures, high sediment load, and low instream flows. Indeed, the South Fork is 303(d)-listed for temperature, instream flow, and fine sediment. Strategies to address limiting factors include: (1) placement of log jams to restore instream habitat (focusing in areas of cool water input to encourage formation of temperature refuges); (2) removal or setback of bank hardening to restore floodplain connectivity; (3) restoration of riparian areas for shade, wood recruitment, and other functions; (4) restoration of wetlands to address high temperatures and low instream flows in the mainstem South Fork; and (5) protection through land use regulation, instream flow negotiation, and acquisition of priority habitats. While we recognize that salmon recovery will require restoration of the watershed processes that form and maintain salmonid habitat, the focus to date has been on actions with potential for significant, immediate benefit to early chinook: placement of log jams.

Tribal staff conduct and/or support monitoring and research that will inform adaptive management of salmon recovery strategies over the long term. In particular, we seek to improve understanding of groundwater-surface water interactions that influence temperature and instream flow in the South Fork Nooksack River. Specifically, proposals are sought to address the following objectives:

1. Develop a groundwater model for the South Fork Nooksack River under a minimum of existing and restored (and preferably historical) scenarios, that can be integrated with the existing South Fork hydrological model, as well as the South Fork temperature model that is currently in development.

2. Quantify the existing and restored (and preferably historical) contribution of wetlands to South Fork temperature and baseflow to inform identification and prioritization of salmon recovery actions.

Existing or ongoing studies that are relevant to this effort include:

- Hydrological Modeling (Appendix 1). To support watershed planning and establishment of new instream flows, Utah State University developed hydrological models for the Nooksack River watershed, including the South Fork. Project scope and budget prevented much more than a rudimentary characterization of groundwater processes. Improved characterization and model refinement will support negotiations for instream flows in the South Fork.
- South Fork Temperature TMDL Project. Tribal staff are participating on a technical advisory committee for the TMDL Project, which will entail development of a South Fork temperature model. As with above, project scope will limit the ability to accurately characterize groundwater inputs, but we expect that model inputs can be subsequently refined as new information becomes available. The project consultant is currently in the process of reviewing and recommending the model that will be applied; the model selection phase is anticipated to be completed by Spring 2012.
- Potential wetland restoration sites (Appendix 1). Washington Department of Ecology staff developed a dataset for potential wetland restoration sites in the Nooksack River watershed, including the South Fork. Sites were evaluated using a series of GIS models for impairment and restoration potential for each of 18 functions, including temperature and baseflow maintenance.

A partial inventory of available reports and information is provided in Appendix 1. We have secured \$150,000 in funding for phase 1 of this work. Funding for subsequent phases is possible but not guaranteed.

Study Area

The Nooksack River watershed drains the western slopes of the Cascade range in northwestern Washington State (Figure 1). The Nooksack River is comprised of three forks, the North, Middle, and South. The North and Middle Forks drain the glaciers and snowfields of Mt. Baker and Mt. Shuksan and flow westward through steep, heavily forested terrain, converging at river mile 40.5. The South Fork (Figure 2) originates on the snow-dominated eastern slopes of the Twin Sisters and drains similarly steep, forested terrain through the upper 23 miles, then a broad, gently sloping valley for 16 miles before joining the Nooksack River at river mile 36.6. The South Fork Nooksack River watershed area is 185 mi², and watershed elevations range from 215 to 7010 feet. Mean annual precipitation is 87 inches. The U.S. Forest Service manages the watershed from the headwaters to approximately RM 33. Downstream to RM 25, the lands adjacent to the South Fork are managed for conservation by Seattle City Light with areas downstream and upslope managed for commercial forestry. The alluvial valley of the lower South Fork is dominated by agricultural and rural residential land uses. Land use impacts in the South Fork Nooksack River watershed include logging in the upper portions of the watershed, and floodplain forest clearing and draining of historically extensive wetland complexes in the lower South Fork valley. Additionally, log jams were removed from the South Fork for navigation and log transport, and the channel was constrained by bank hardening to protect stream-adjacent roads, railroads, infrastructure and productive farmland.

Evaluation Criteria

Proposals will be evaluated based on the following criteria:

1. Experience, expertise, and capabilities of the project team.
2. Familiarity with hydrogeology, hydrology, and wetland processes in the South Fork Nooksack River watershed and/or similar watersheds.
3. Familiarity with numerical models for stream temperature and instream flow, and demonstrated ability to integrate groundwater models to such models.
4. Technical merits of proposal.
5. Timeline.
6. Cost.

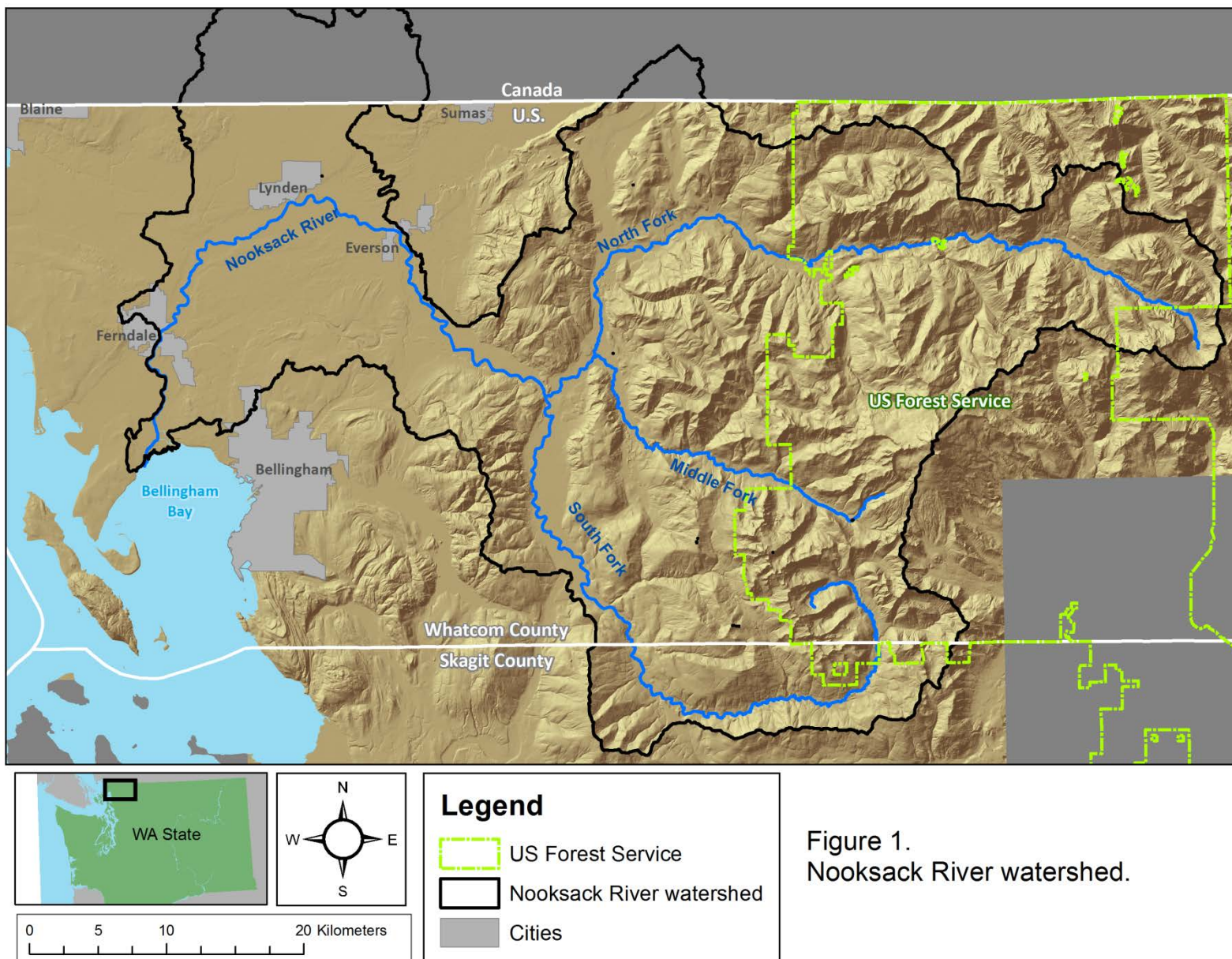
Submittal Requirements

Interested parties should send the following:

- Organizational flow chart and discussion of project personnel and their anticipated roles in the project.
- Statement of qualifications of the organization and project team members, including documentation of peer-reviewed work and experience supporting instream flow assessment and temperature modeling.
- Proposal, including detailed scope of work, budget, timeline, and deliverables, for developing a groundwater model for the South Fork Nooksack River. Proposal should include description of phasing tied to available funding (phase 1 funding: \$150,000), with emphasis on how deliverables from each phase contributes to project objectives in case subsequent funding is not procured.

Please submit one (1) hard copy and an electronic version (CD/DVD, email, or ftp) of the proposal package by 5 pm, March 20, 2011, to:

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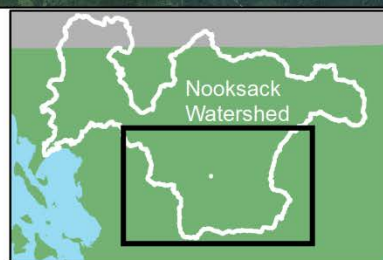
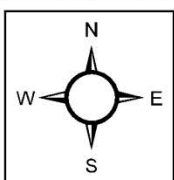
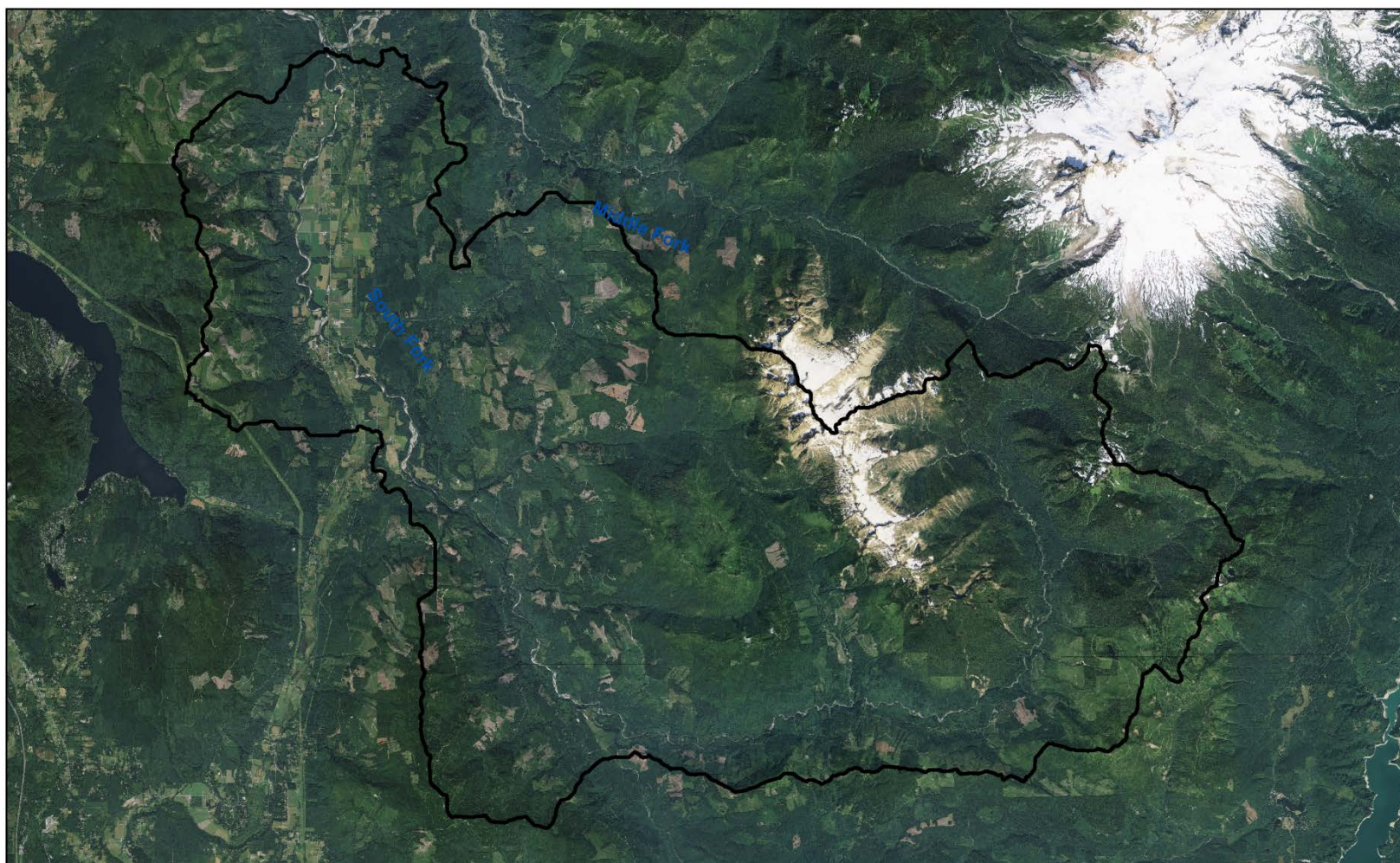


Figure 2.
South Nooksack River watershed.
Basemap: 2011 NAIP Airphoto

APPENDIX 1: AVAILABLE BACKGROUND INFORMATION TO SUPPORT PROPOSAL DEVELOPMENT

Note: This is not intended to be a comprehensive inventory of all relevant information.

Nooksack River Watershed Hydrologic Modeling

In 1999, in response to the Washington State Watershed Management Act, five governments – the City of Bellingham, Lummi Nation, Nooksack Tribe, Public Utility District No. 1 of Whatcom County, and Whatcom County – initiated watershed planning for Water Resource Inventory Area 1 (WRIA 1), the Nooksack Basin. A scope of work was developed for the WRIA 1 Watershed Management Project, and Utah State University was selected to conduct technical assessment and analysis of the major elements: water quantity, water quality, instream flow, and fish habitat. This technical work supported development of a Watershed Management Plan, adopted in 2005, and a Detailed Implementation Plan, adopted in 2007. General background on the WRIA 1 Watershed Management Project can be found at <http://wria1project.whatcomcounty.org>. Studies and reports related to the water quantity component are available at: <http://wria1project.whatcomcounty.org/Resource-Library/Studies-And-Reports/Water-Quantity/66.aspx>

WRIA 1 Salmonid Recovery Plan

The *WRIA 1 Salmonid Recovery Plan* presents recovery goals; watershed background; habitat, harvest and hatchery limiting factors; and recommendations for strategies and actions to recover Nooksack salmon. It constitutes the local chapter of the *Puget Sound Salmon Recovery Plan*.

<http://whatcomsalmon.whatcomcounty.org/action-processes-recoveryplan.html>

South Fork Nooksack River Habitat Assessments

To support salmon habitat restoration planning, reaches of the South Fork Nooksack River have been assessed to identify limiting habitat conditions and impacts to watershed processes. The following reports document that work:

- Soicher, A., T. Coe, and N. Currence. 2006. South Fork Nooksack River Acme-Confluence Reach Restoration Planning: Analysis of Existing Information and Preliminary Restoration Strategies. Final Report to Salmon Recovery Funding Board, IAC #01-1500N. May 1, 2006. Nooksack Indian Tribe, Natural Resources Department. Deming, WA.
<http://hwsconnect.ekosystem.us/File/360/1398>
- Maudlin, M., T. Coe, N. Currence, and J. Hansen. 2002. South Fork Nooksack River Acme-Saxon Reach Restoration Planning: Analysis of Existing Information and Preliminary Recommendations. November 26, 2002. Lummi Nation, Natural Resources Department. Bellingham, WA.
<http://hwsconnect.ekosystem.us/File/360/1400>
- Brown, M., M. Maudlin, and J. Hansen. 2007. Upper South Fork Nooksack River Habitat Assessment. August 31, 2007. Lummi Nation, Natural Resources Department. Bellingham, WA.
<http://hwsconnect.ekosystem.us/File/360/1565>

Other Studies

- Cox, S.E., F.W. Simonds, L. Doremus, R.L. Huffman, and R.M. Defawe. 2005. Ground Water/Surface Water Interactions and Quality of Discharging Ground Water in Streams of the Lower Nooksack River Basin, Whatcom County, Washington. U.S. Geological Survey, Scientific Investigations Report 2005-5255. 46pp.
<http://pubs.usgs.gov/sir/2005/5255/pdf/sir20055255.pdf>

- Washington Department of Ecology. 2000. Potential wetland restoration sites in the Nooksack River Basin. GIS coverage. Metadata: <http://dl.dropbox.com/u/15024633/potwet.htm> . More complete description of methods: http://dl.dropbox.com/u/15024633/POTWET_methods.pdf

Additional Information (to be made available as needed to successful applicant)

- Geospatial data
 - o LiDAR coverage of South Fork valley (2009 lower reaches; 2005 upper reaches)
 - o Aerial photography (NAIP, Pictometry, other sources; 1933-2011)
 - o Historic conditions in the valleys of the Nooksack River and Forks (1880, 1910, 1938, 1998)
 - o Land use/Land Cover (NOAA CCAP 1996, 2001, 2006)
 - o USGS topographic maps (DRGs)
 - o Hydrography
 - o Forest Practices wetlands (WA DNR)
 - o Potential wetland restoration sites (WA Dept. Ecology 2000; see above)
 - o FLIR (Forward-looking Infrared Radiation)-derived surface temperature grids
 - o Soils
 - o Surficial geology
- Other data
 - o Continuous temperature during summer at multiple sites along South Fork Nooksack River and at lower ends of tributaries (1999-present)
 - o Seepage run data for South Fork (1998-1999?)