

Lummi Indian Reservation Wind Energy Development Feasibility Assessment



Jeremy Freimund, P.H.
Water Resources Manager
Lummi Natural Resources Department
U.S. Department of Energy Tribal Energy Program Review
November 19, 2009



Purpose Statement

- The purpose of this presentation is to:
 - Provide summary information about the Lummi Nation; and
 - Summarize the Lummi Indian Reservation Wind Energy Development Feasibility Assessment Project.
-

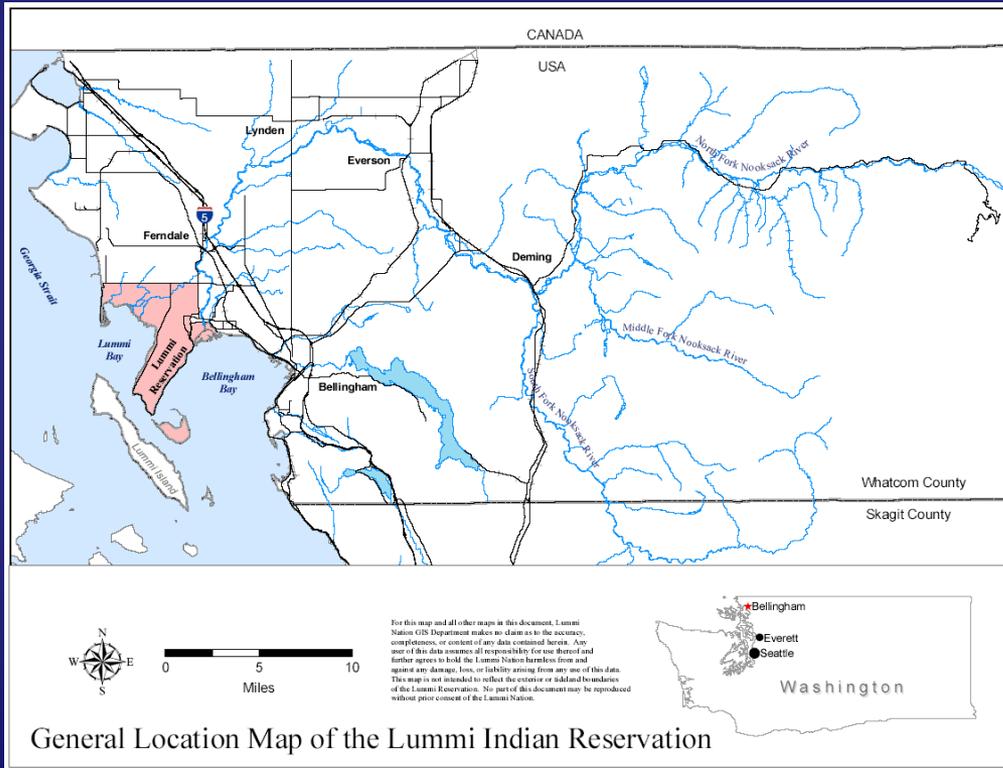
Lummi Nation Overview





Brief History – the Reservation

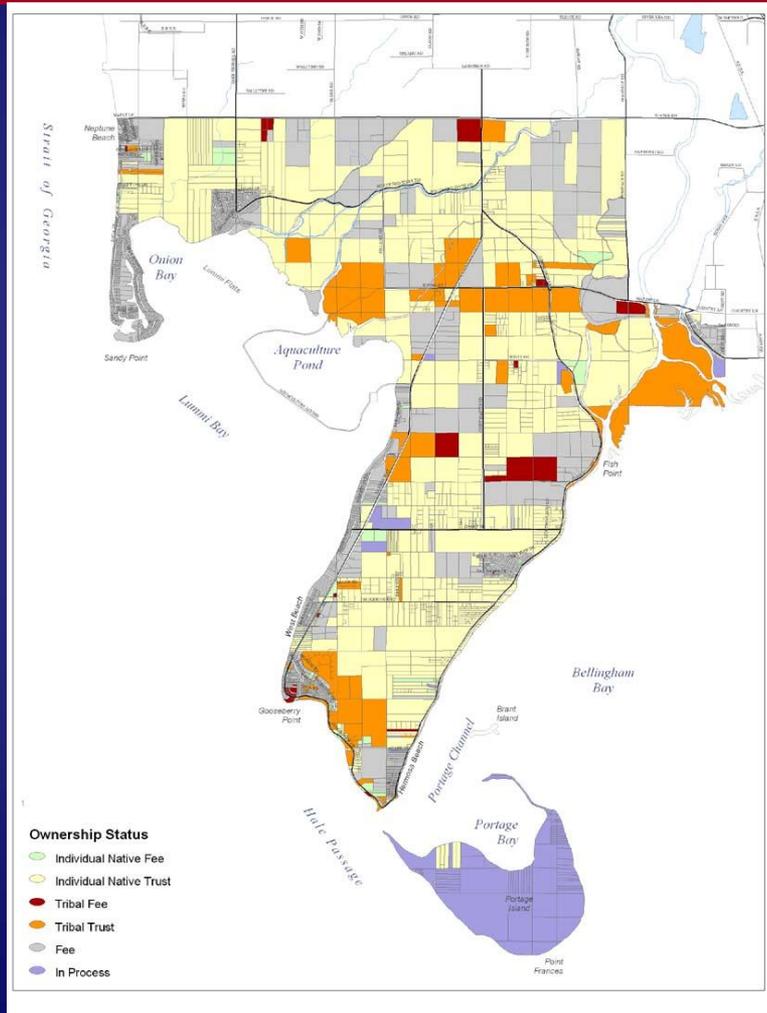
- The Lummi Indian Reservation was created and reserved for the exclusive use of the Lummi people by the 1855 Point Elliot Treaty
- The Reservation is intended to be a permanent, economically viable homeland for the Lummi people.



General Location Map of the Lummi Indian Reservation



The Lummi Reservation Today



- Lummi Reservation comprised of approximately 12,500 acres of upland and about 7,000 acres of tidelands.
- Lummi Nation and/or enrolled members own about 75 percent of uplands.
- Lummi Nation owns 100 percent of tidelands.

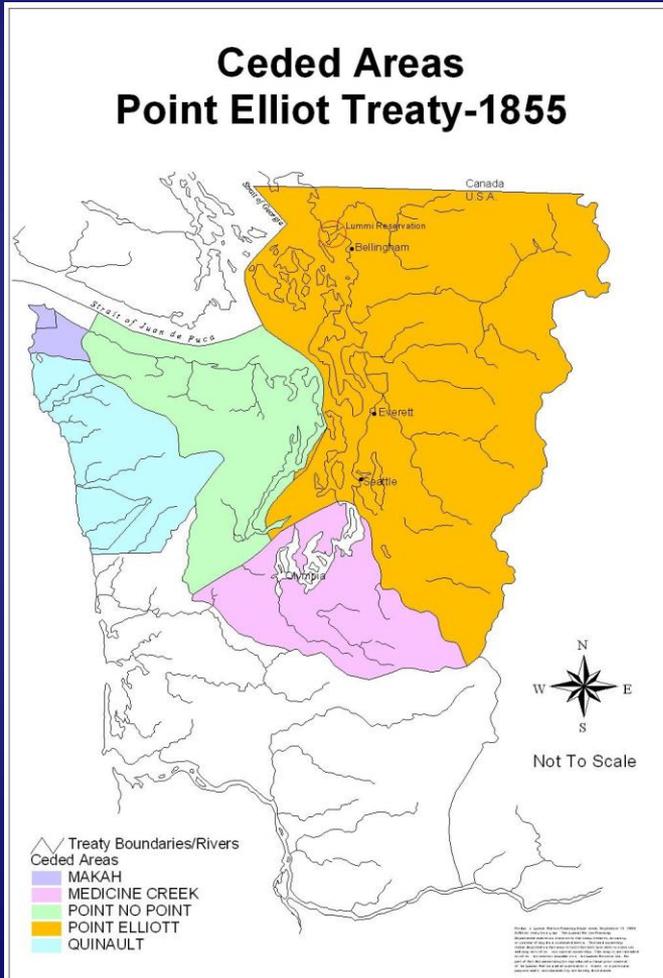


Brief History - Overview

- Like most northwestern Indian tribes, the Lummi have a relatively small Reservation and a large Usual and Accustomed (U&A) area.
- The Lummi are a fishing tribe – Lummi fish for salmon, other finfish, and shellfish (e.g. crab, clams, oysters).
- Lummi rights to harvest fish throughout the U&A is guaranteed by the Treaty. These rights have been re-affirmed by various federal court cases including the 1974 Boldt decision.
- Treaty Tribes are ensured 50 percent of the Total Allowable Catch and are fishery co-managers.



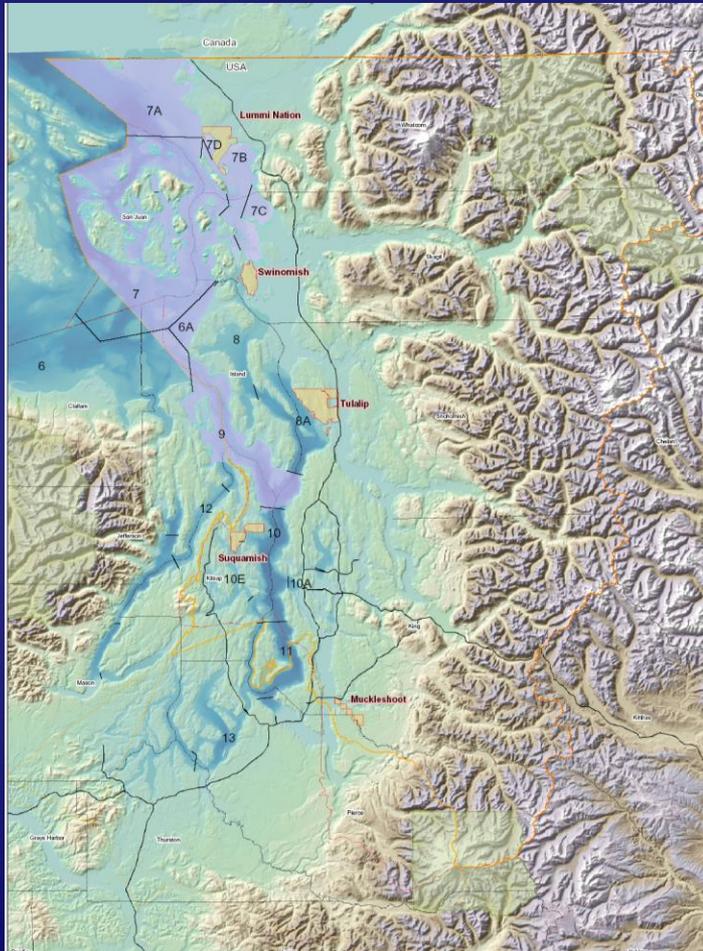
The Point Elliot Treaty



- Lummi is a Coastal Salish tribe
- As part of the Point Elliot Treaty of 1855, vast areas of land were ceded to the United States
- The Treaty created a trust responsibility for the United States with respect to the Lummi Nation
- U.S. government agencies can not permit activities unless tribal interests are protected.



Brief History – the U&A



- Lummi fishing, hunting, and gathering rights were reserved by the Treaty at all Usual and Accustomed (U&A) grounds and stations.
- Lummi Nation U&A grounds and stations include:
 - Nooksack River Basin,
 - Coastal rivers/streams from Fraser River to environs of Seattle,
 - San Juan Islands.

Lummi is a Fishing Tribe



Lummi is a Fishing Tribe

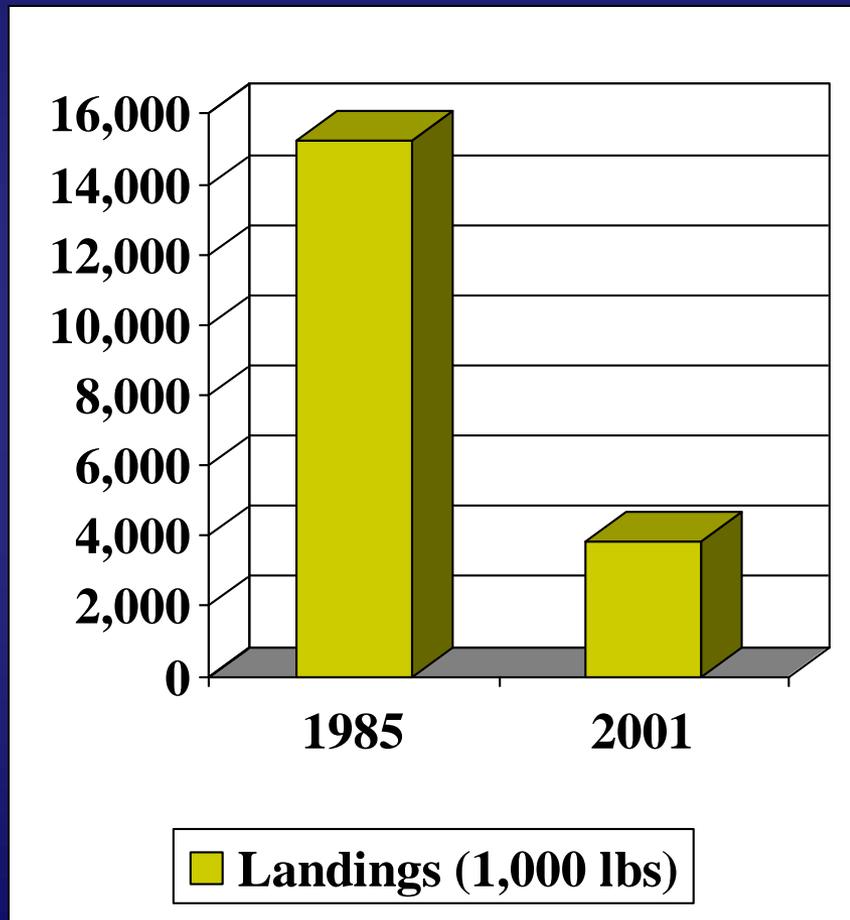


Lummi is a Fishing Tribe





Lummi is a Fishing Tribe



- In 1985, the Lummi Fishing Fleet landed about 15.3 million pounds of fin- and shellfish.
- In 2001, the combined harvest was about 3.9 million pounds of fin- and shellfish.
- The reduced harvest is largely due to declines in salmon and other finfish abundance.
- Crab fishery is now the most important.



The Lummi People



- Approximately 4,200 enrolled Lummi tribal members.
- Approximately 2,400 tribal members live on Reservation – the remainder live in the region or elsewhere.





The Lummi Government

- The Lummi Nation is a sovereign government and has been since time immemorial.
- The Lummi Nation was one of ten tribes nationally that initiated the Self-Government Demonstration Project (1988).
- The Lummi Nation is governed by an elected 11 member Lummi Indian Business Council, various commissions, and the General Council (all voting enrolled members).
- Numerous departments (e.g., Cultural, Economic Development, Police, Education, Health, Planning, Natural Resources)
- Independent Tribal Court system.
- Currently no tribal electric/power utility.



Governmental Actions



- Promote education and opportunities for tribal youth (investing in Human Resources).
- Construction of a new \$24 million K-12 school completed during 2004.
- Establish a regulatory framework to protect public health and welfare, natural resources, cultural resources, and to support economic development.
- See website (www.lummi-nsn.gov) for more information, Lummi Code of Laws, and the Lummi Nation Atlas.



Governmental Actions



- Create family wage jobs
 - Lummi government and enterprises combined are the 3rd largest employer in the Whatcom County area.
 - Tribal enterprises include the Silver Reef Hotel, Casino, Spa; gas stations; mini-marts; Northwest Indian College; K-12 School.
- Train dislocated workers
 - Construction trades
 - Natural Resources restoration
- Seek new business opportunities to continue economic diversification and increase self-reliance and economic independence.

Lummi Indian Reservation Wind Energy Development Feasibility Assessment Project





Project Objective

- Provide the information needed by the Lummi tribal council to make a knowledge-based determination if a wind generation project on the Reservation provides enough economic, environmental, cultural, and social benefits to justify the cost of development.
-



Project Objective

- Answer the following three key questions:
 - Is there enough wind to justify further pursuit of developing wind energy generation capabilities on the Reservation?
 - What are the likely wildlife impacts associated with installing one or more wind turbines and what are practicable mitigation measures if there are unavoidable impacts?
 - What are the likely noise impacts associated with installing one or more wind turbines and what are practicable mitigation measures if there are unavoidable impacts?
- Other impacts will be evaluated during TEPA/NEPA compliance if a determination is made to develop a wind generation project.



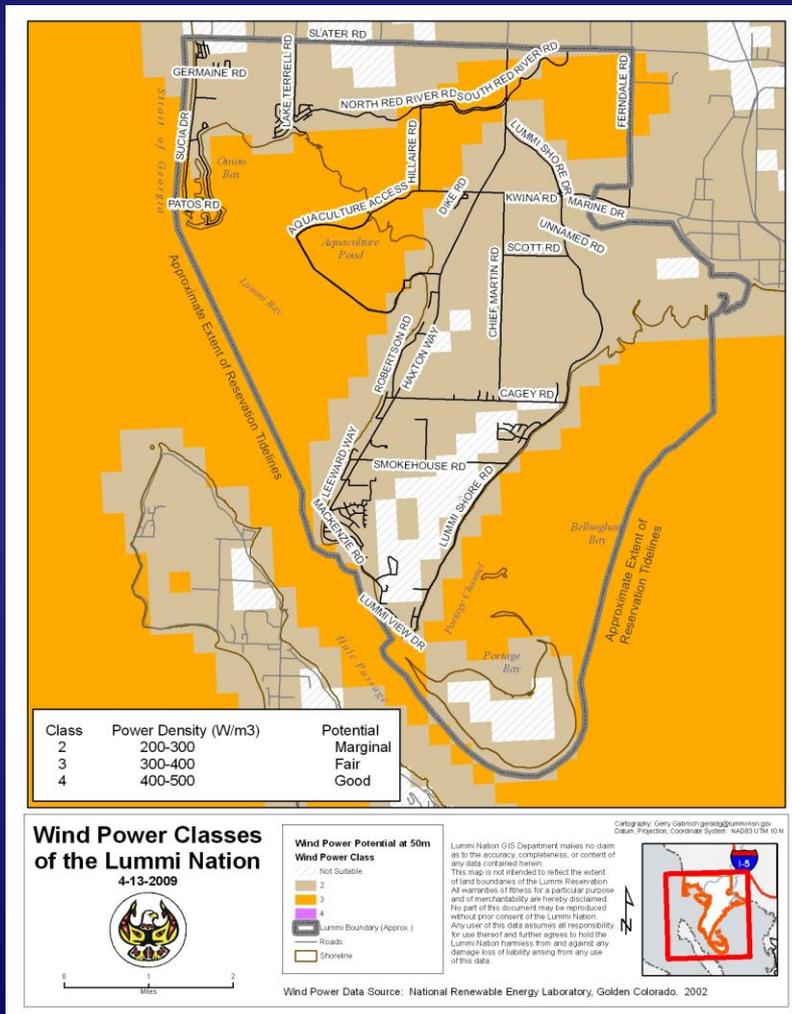
Project Participants

- Lummi Natural Resources Department staff members are assigned as the project manager and project support.
 - Due to short duration and specialized expertise, one or more consultants will be selected and contracted to conduct the analyses needed to answer the three primary questions.
-



Is There Enough Wind Power?

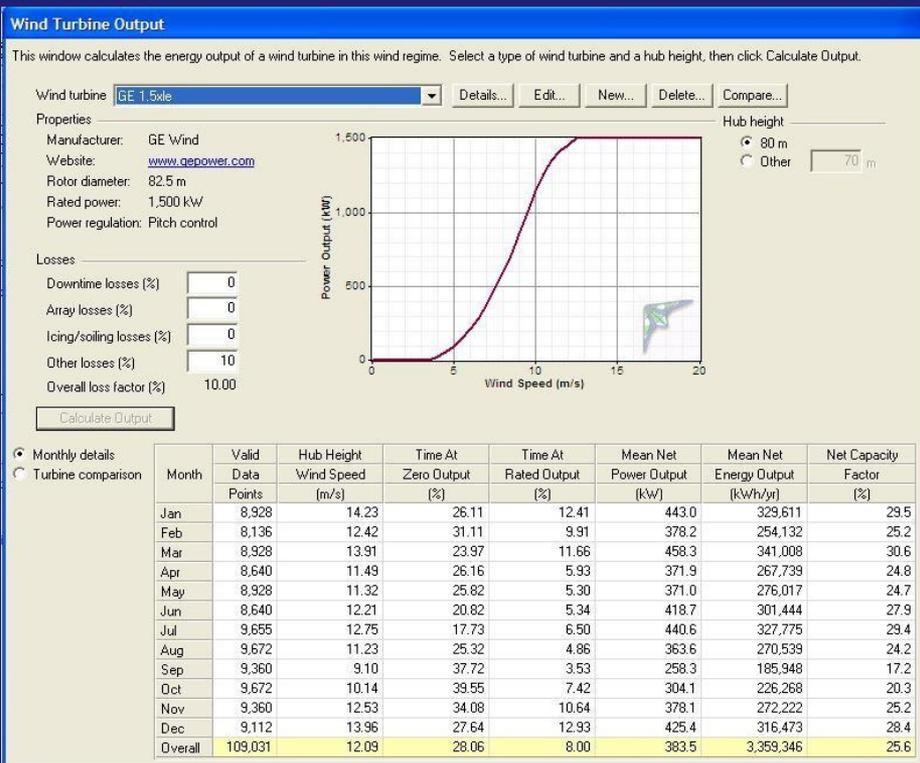
- National Renewable Energy Laboratory (NREL) wind power assessment indicates that large areas of tidelands and floodplain have “Fair” (Class 3) wind power potential.
- The NREL data are not sufficient to make the substantial capital investments associated with installing wind turbines and associated transmission infrastructure.





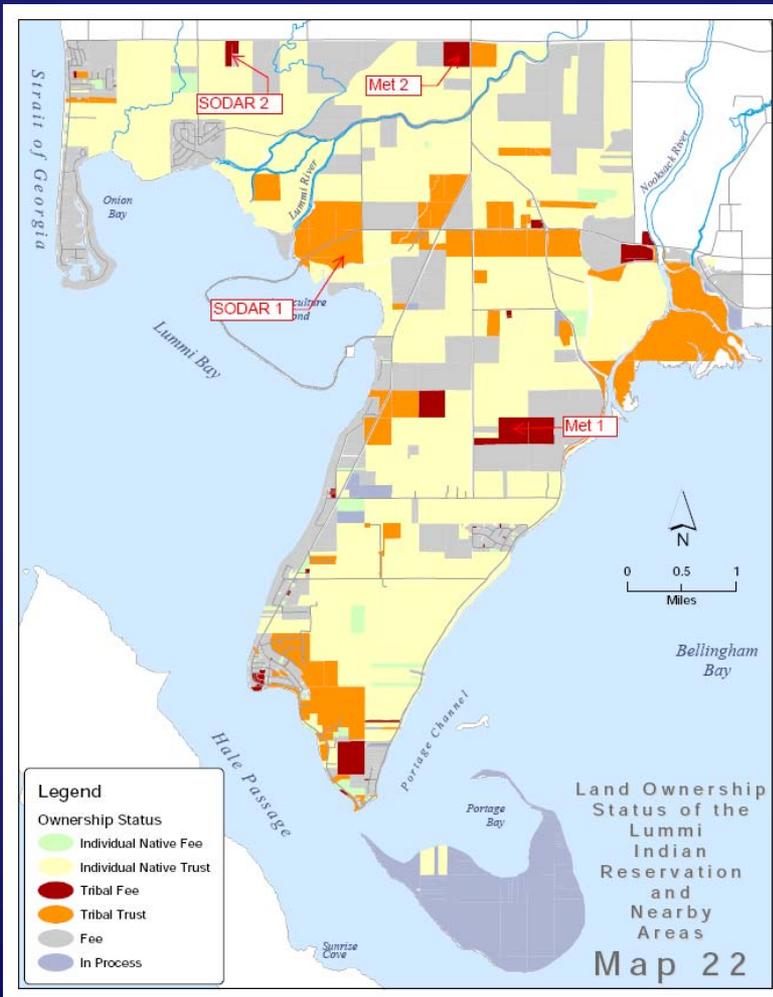
Is There Enough Wind Power?

- Preliminary assessment based on the nearby Bellingham Airport wind data indicated a capacity factor of 25%.
- Preliminary assessment suggests that a single 1.5 MW turbine could produce an average net energy output of 3,359 MWh/year, or enough energy for about 300 homes if wind were available 24/7.





Project Components



- Wind Energy Assessment:
 - Advertise and select a qualified contractor
 - Jointly conduct a wind monitoring equipment siting survey
 - Obtain tribal land use permits for installations



Project Components



- Wind Energy Assessment (continued):
 - Purchase and install two continuously recording, 60-meter tall anemometers stations equipped with modems to allow weekly downloads of data – operate stations for one year.
 - Rent a SODAR unit to measure wind 200 meters above the ground, calibrate at the anemometer sites, measure wind at two additional sites, correlate results.



Project Components

- Wind Energy Assessment (continued):
 - Contractor to correlate wind data collected at the anemometer and SODAR sites with longer term sites at the Bellingham Airport and other nearby sites (e.g., aluminum smelter, oil refineries) to estimate the long-term wind conditions.
 - Contractor to analyze the collected and correlated wind data using wind modeling software.
-



Project Components

- Related Assessments:
 - A contractor to complete an assessment of the impacts of one or more wind turbines on Reservation wildlife.
 - A contractor to complete an assessment of the noise impacts of one or more wind turbines on surrounding landowners and Reservation businesses.
-



Project Components

- Final Report prepared by the contractor(s) will include:
 - A wind map for the Reservation based on the collected and correlated wind data.
 - A recommended wind turbine for the Reservation conditions that considers the results of the wildlife and noise impacts assessments.
 - An economic analysis that includes estimated capital costs, maintenance costs, variable discount rates plotted against the estimated value of energy in a pro-forma analysis over a 20-year live cycle.
-



Project Components

- Final Report will also include:
 - An analysis of a single turbine at each site and a wind farm layout using the Wind Farmer software package and property boundary constraints to estimate wind farm size and potential energy production.
 - An analysis of the tribal load and export market.
 - LNR Project staff and contractor(s) will present results and recommendations to Lummi policy makers and tribal council.
-



Project Schedule

- Assumed a grant start-up date of Oct. 1, 2009 – award is still pending.
 - Select a contractor within 3 months of grant award
 - Conduct siting survey, purchase and install equipment within 3 months of contract award.
 - Collect wind data for 12 months following installation.
 - Conduct wildlife and noise assessments during wind data collection period.
 - Complete final analyses and report within 6 months following data collection period.
 - Overall project period estimated to be 2 years.
-

Summary and Conclusion





Summary and Conclusion

- Lummi is a Fishing Tribe – economic diversification is a priority.
- This project will provide the information needed by the Lummi tribal council to make a knowledge-based determination if a wind generation project on the Reservation provides enough economic, environmental, cultural, and social benefits to justify the development costs.
- Approximately two years are anticipated to collect the empirical wind data, evaluate impacts to wildlife and landowners, and complete the feasibility assessment.

Thank You to the Department of Energy Tribal Energy Program!



Jeremy Freimund, P.H.
Water Resources Manager
Lummi Natural Resources Department
(360) 384-2212
jeremyf@lummi-nsn.gov