Lummi Indian Reservation Wind Energy Development Feasibility Assessment

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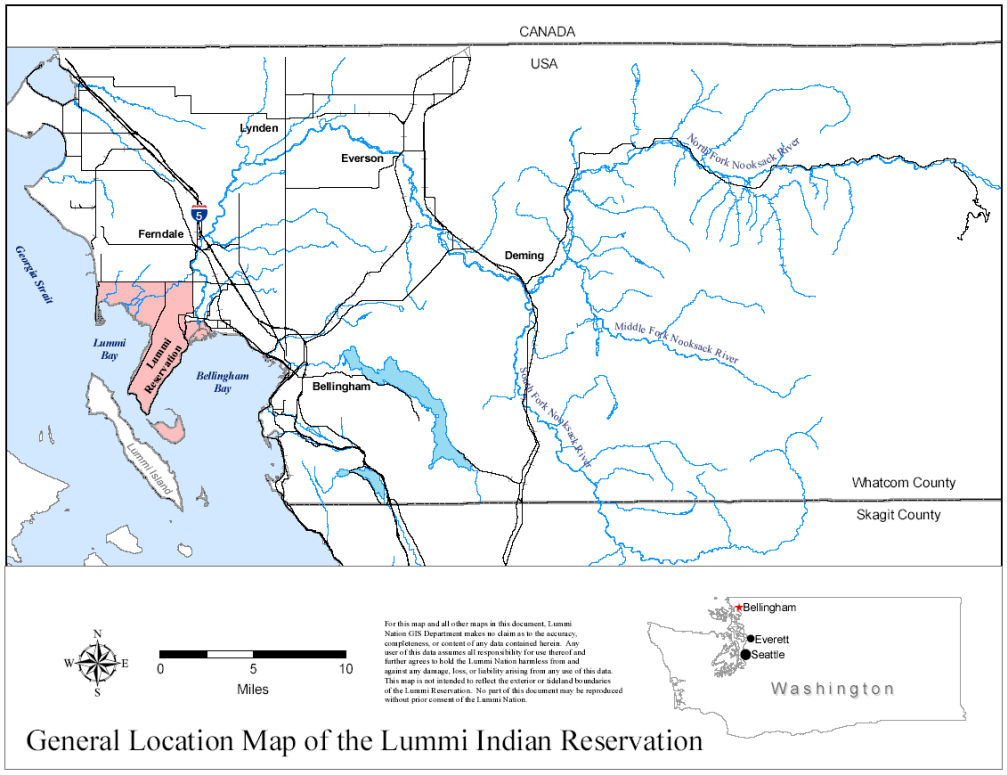
Purpose Statement

- The purpose of this presentation is to:
  - Provide summary information about the Lummi Nation;
  - Describe the Lummi Indian Reservation Wind Energy Development Feasibility Assessment Project; and
  - Provide an update on the project status and preliminary results.

Lummi Nation Overview

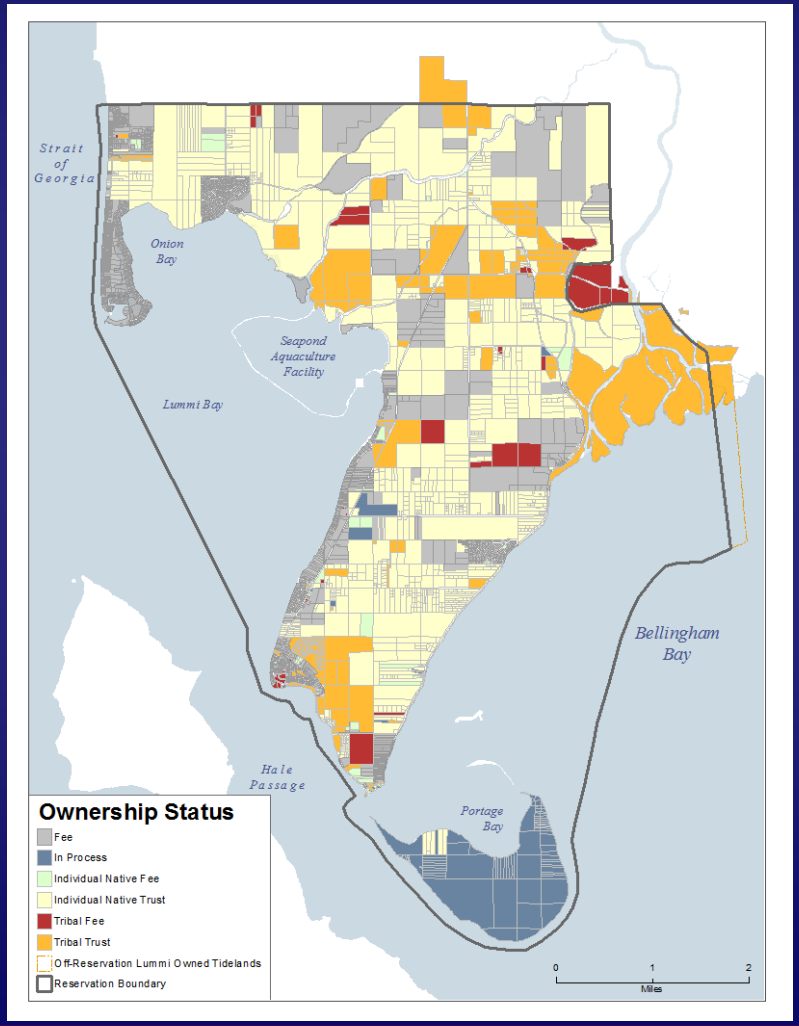
Brief History – the Reservation



General Location Map of the Lummi Indian 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.

The Lummi Reservation Today



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

Lummi is a Fishing Tribe

Lummi is a Fishing Tribe

The Lummi People

- There are approx. 4,650 enrolled Lummi tribal members.
- Approximately 2,650 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.
- The Lummi Nation is governed by an elected 11 member Lummi Indian Business Council, various commissions, and the General Council (all voting enrolled members).
- There are numerous departments (e.g., Cultural, Economic Development, Police, Education, Health, Planning, Natural Resources) and an independent Tribal Court system.
- Currently a tribal water and sewer district but no tribal electric/power utility.

Governmental Actions

Drilling for one of 120 wells that are part of the geothermal heat pump for the new tribal administrative building – each well is approximately 350 feet deep.

- Promote education and opportunities for tribal youth (investing in human resources).
- Establish a regulatory framework to protect public health and welfare, natural resources, cultural resources, and to support economic development.
- Currently constructing a $28 million tribal administrative building that includes a geothermal heat pump.
- 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.
- Seek new business opportunities to continue economic diversification and to increase self-reliance and economic independence.

Lummi Indian Reservation Wind Energy Development Feasibility Assessment Project

Project Objective

- Provide the information needed by the elected 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.

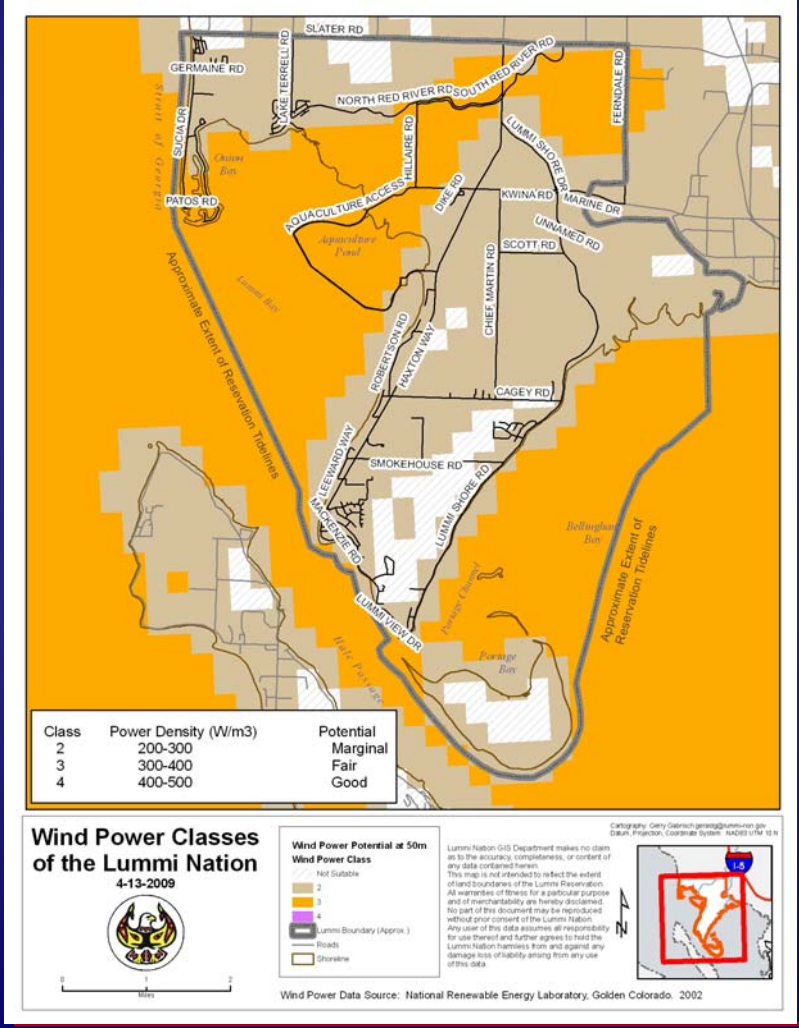
Project Objective

- 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 the TEPA/NEPA compliance if a determination is made to develop a wind generation project.

Project Participants

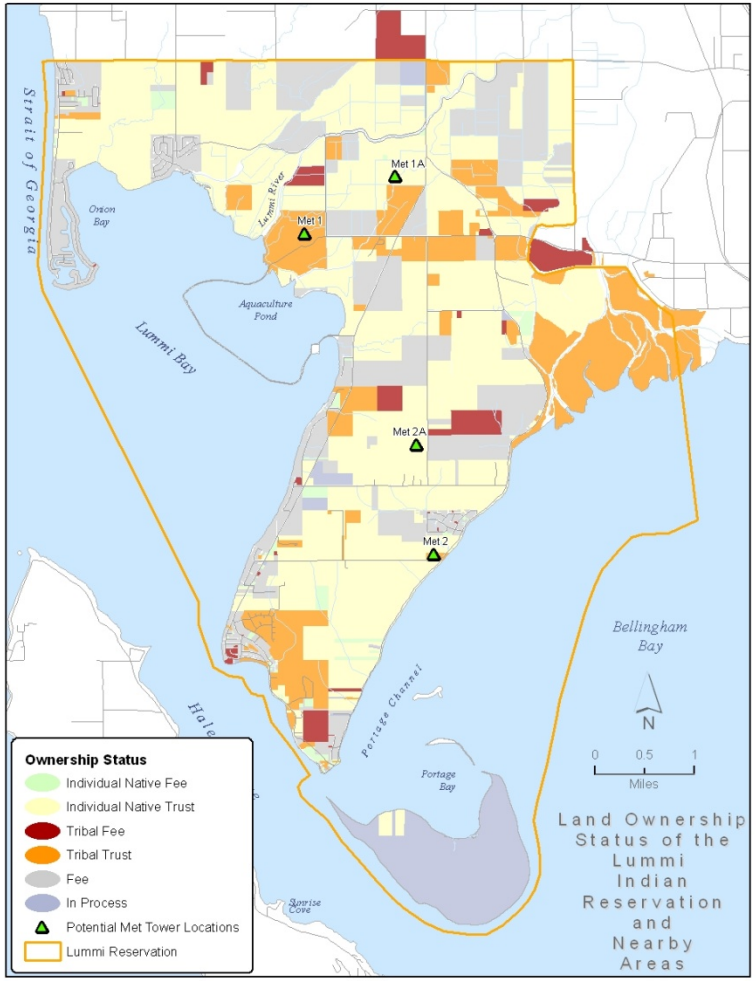
- Lummi Natural Resources Department staff members are assigned as the Project Manager and project support.
- Due to short duration and specialized expertise, consultants have been contracted to conduct the analyses needed to answer the three primary questions.
  - Wind Assessment – DNV Renewables (USA)
  - Wildlife Assessment – Hamer Environmental
  - Noise Assessment – j. c. brennan & associates

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.

Project Components



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

Project Components

- Purchase or borrow and install two continuously recording, 60-meter tall anemometers stations equipped with modems to allow daily downloads of data – operate stations for one year.

- Wind Energy Assessment (continued):
  - Contractor to correlate wind data collected at the anemometer 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 – primarily bats and marbled murrelets but also other water fowl.
  - A contractor to complete an assessment of the noise impacts of one or more wind turbines on surrounding landowners and Reservation businesses and help us develop a noise ordinance.

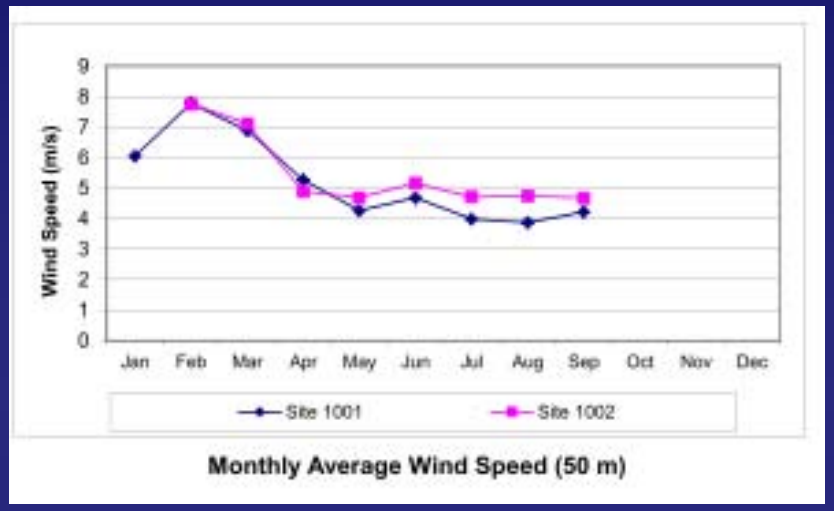
Project Components

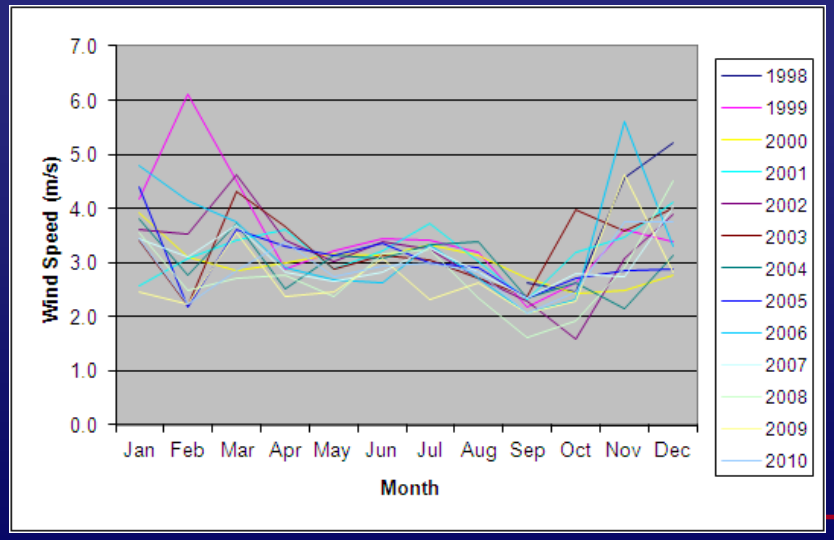
- Final Report prepared by the contractor(s) will include:
  - A wind map for the Reservation based on the collected and correlated wind data.
  - A recommended wind turbine for the Reservation conditions that considers the results of the wildlife and noise impacts assessments.
  - An economic analysis 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 life 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 to the elected tribal council.

Preliminary Results/Status

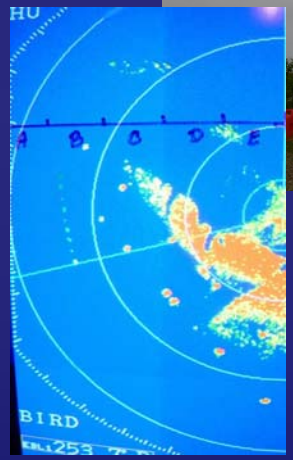




Wind Assessment

- Wind data are being collected from two anemometer towers.
- Wind data from other sources have been collected.
- SODAR study cut due to budget constraints.
- Assessment is pending the results of an entire year of collected data.

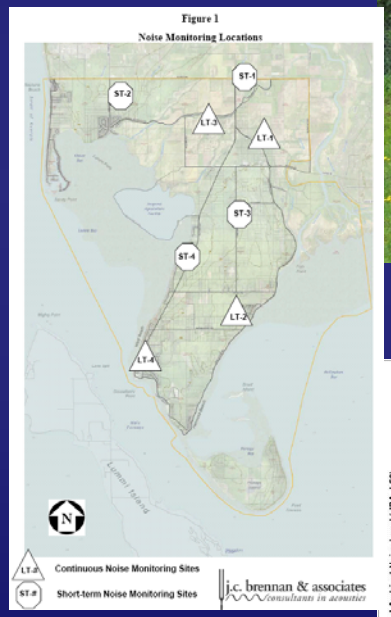
Preliminary Results/Status

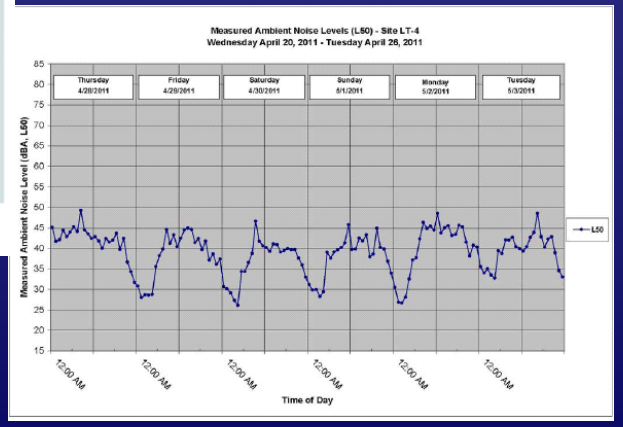


Wildlife Assessment

- Background literature-based assessment drafted.
- Marbled Murrelet study completed (4 murrelet type targets per survey morning [i.e., low utilization rate]).
- Bat utilization data collection from April 15 to November 15.
- Analysis pending completing data collection.

Preliminary Results/Status





Noise Assessment

- Contractor provided a recommended sample noise ordinance.
- Ambient Noise Study completed.
- CadnaA Noise Prediction Model developed and calibrated using tsunami warning system.
- Further analysis pending turbine selection.

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 elected Lummi tribal council to make a knowledge-based determination regarding the feasibility of a wind generation project on the Reservation.
- Approximately two years are needed to select and contract consultants, collect the empirical wind data for one year, evaluate impacts to wildlife and landowners (noise) concurrently with the wind data collection, and complete the feasibility assessment.

Summary and Conclusion

- Study is well underway and expected to be completed by March 31, 2012.
- We have learned numerous lessons along the way and tried to share many of them last year – if you are just starting a similar project, you may want to refer to the 2010 Tribal Program Review or contact us.
- Next steps depend on the Council's decision and available funding but will likely include continuing data collection (wind and wildlife in particular) and refining economic/financial analysis results.

Thank You!

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