

**COMMUNICATING TRADITIONAL KNOWLEDGE:
PROPHET RIVER FIRST NATION
FINAL REPORT TO SCEK – PHASE 4 (Extract)
JANUARY 31, 2011**

Dr. Jane Young and Ms. Cathy MacKay

Project partners:

**Mr. Brian Wolf (PRFN)
Ms. Angela White (Encana)
Ms. Cathy MacKay (EDI)
Dr. Jane Young (UNBC)**

Note:

This document is an extract from the project's final report and user manual for the Spatial Data Decision Making Tool (SDDT)—one of the project's deliverables. This extract is intended to provide an overview of the SDDT's—its uses and functionality for First Nations groups when conducting application referrals. More information on the SDDT can be obtained by contacting Dr. Jane Young at the University of Northern British Columbia or the Prophet River First Nation (PRFN).

Project Introduction:

This project, spanning over the period from January 1, 2009 – January 31, 2011, was extremely successful in several ways. Benefits were plenty to Prophet River First Nation (PRFN), the University of Northern British Columbia (UNBC), Encana, and Environmental Dynamics Inc. (EDI). Deliverables that resulted from this project will be educational and very useful. Thirty-two sites were visited on the PRFN Traditional Territory, and 200 representative plant specimens were collected. Traditional knowledge (TK) of PRFN has been documented and preserved in various ways, and a process has been developed to enhance First Nations and industry relations using spatial data techniques.

Objectives of Project:

This SCEK project had two primary objectives or components that were addressed by our research:

- To compile and perpetuate traditional knowledge (TK) of Prophet River First Nation; and
- To integrate TK of PRFN in a spatial format to enhance decision-making for more input by PRFN to industry referrals.

Spatial Data Decision-Making Tool

Communicating Traditional Knowledge: Prophet River First Nation

By

Sam Barnes, Undergraduate Student
Ecosystem Science and Management Program, University of Northern British Columbia,
3333 University Way Prince George, BC V2N 4Z9

Cathy MacKay, M.Sc., R.P.Bio., P.Ag.
Environmental Dynamics Inc., Suite 201 - 1110 Sixth Avenue, Prince George, BC
V2L 3M6

Jane Young, B.Sc., M.Sc., Ph.D.
Ecosystem Science and Management Program, University of Northern British Columbia,
3333 University Way Prince George, BC V2N 4Z9

Prepared for

**CTK:PRFN Partners
and
Science and Community Environmental Knowledge Fund**

November, 2010

(Extract from) Manual for Spatial Data Decision-Making Tool

Sam Barnes, Cathy MacKay, and Jane Young
November 2010

Note: Terms in bold are defined in the “Terms and Acronyms” section at the end of the manual.

SDDT Introduction

This knowledge base provides a framework allowing PRFN to independently and effectively work with industry to mitigate impacts to traditional plants and plant gathering locations.

The Spatial Data Decision-Making Tool (SDDT) is a **geographic information system** (GIS) based tool used to determine traditionally important plant gathering locations or sites that may contain traditionally important plants within the Prophet River First Nation (PRFN) Consultation Area. The SDDT is the culmination of two years of research with PRFN, mapping and collecting **traditional ecological knowledge** (TEK) regarding plants and plant gathering sites. The research project consisted of four partners: PRFN, the University of Northern British Columbia, Environmental Dynamics Inc., and Encana. Having traditional plant gathering sites and potential locations compiled in the SDDT allows PRFN to more efficiently and effectively respond to industry referrals regarding development within the PRFN Consultation Area.

The SDDT is constructed around a GIS framework using ArcMap (Esri™, Redlands, CA) software as the basis for analysis. The main components of analysis are knowledge of PRFN community members, **biogeoclimatic ecosystem classification** (BEC), and **vegetation resources inventory** (VRI). The knowledge of PRFN community members is inputted to ArcMap as point data for each specific plant gathering site in the consultation area. Attached to each point is an attribute table that includes the plants collected at each site, the date of collection, TEK about the plants or the site, and a photograph reference code. Using this spatial data, simple analyses can be done when responding to industry referrals to determine locations unsuitable for development due to their importance as plant gathering locations. More complex

analyses may be done by incorporating BEC and VRI to create predictive models to determine the potential for occurrences of traditional plant species in proposed development areas.

The SDDT has three components, at three levels, ranging from the plant site to the landscape:

Component 1 - Plant Sites. Specific sites are visited and a database of locations is compiled within the PRFN consultation area.

Component 2 - Criteria. Criteria are determined that influence the location of traditional gathering sites based on traditional knowledge. For example, these could be associated with a unique location the plant lives in, adjacency to other cultural significant locations, access to gathering, or otherwise. The goal is to provide a means for representatives of communities to respond to proposed development in a specific area. Documented criteria can guide the response.

The results of this project documented several influential factors in plant site locations through field trips and formal interviews. One factor that came up repeatedly during field trips was that historical campsite locations influenced traditional use locations and these were dependent on historic travelling routes.

Component 3 - Landscape. An analysis was completed using ArcGIS of the ecosystem attributes where traditional gathering sites tend to occur. This is solely based on sites that were

identified during this project and is based on analysis of proximity of sites to mapped features and ecosystem variables.

SDDT Process

The SDDT can be broken down into two distinct processes to respond to industry referrals. The first process is “Site Analysis” in which locations identified as important plant gathering sites are used to respond to referrals. The second process is “Predictive Modeling” in which the knowledge of PRFN community members, BEC, and VRI are used to determine locations that may contain traditionally important plant species, but are not known to be historic or current plant gathering locations.

Site Analysis

Site Analysis can be used to determine locations that have been identified as important plant gathering locations. From these point data, buffers can be applied to identify locations that coincide with proposed industrial developments and assess the potential impacts to the important plants collected at the identified areas.

Predictive Modeling

The second process that can be done using ArcMap is the identification of potential plant gathering locations using ecological data. To determine potential locations, a VRI algorithm is first constructed by the researcher using ecological information for a specific plant species. With the model constructed, the researcher can use ArcMap to show polygons matching the predetermined algorithm that identify locations where the plant species may occur.

Terms and Acronyms

- **Biogeoclimatic Ecosystem Classification (BEC)**

⇒ A system developed by the BC Ministry of Forests and Range for categorizing different ecosystems in the province based on vegetation, soil type, and topology. Naming conventions of BEC zones include a two to four letter acronym (e.g., Boreal White and Black Spruce [BWBS] Zone). Zones are further classified to include subzones that differentiate by precipitation and temperature or continentality (e.g., BWBSmk is the code for the Moist Cold subzone of the Boreal White and Black Spruce Zone). For further explanation regarding BEC Zone classification, refer to the BEC Program website at (<http://www.for.gov.bc.ca/hre/becweb/index.html>)

- **Geographic Information System (GIS)**

⇒ An information system that is used to work with information that has a geospatial reference. A GIS is a database for geospatial data as well as a tool to manipulate and analyze geospatial data (Star and Estes 1990)

- **Traditional Ecological Knowledge (TEK)**

⇒ Knowledge that has been acquired by a group of people through many years of living in direct contact with nature (Johnson 1992)

- **Vegetation Resources Inventory (VRI)**

⇒ A system developed by the BC Ministry of Forests and Range to identify where vegetation resources occur within the province and how much of the resource is present in a given area. VRI is constructed in two phases: Phase I is the use of air photos to classify areas based on vegetation resources; Phase II is ground sampling of areas to adjust the vegetation estimates established in Phase I. It is important to note that VRI is a “snapshot in time” of vegetation resources and may not fully reflect the current state of vegetation. Additionally, VRI is an incomplete data set for the PRFN Consultation Area; some characteristics have not been classified and are not available for analysis. For more information regarding VRI, refer to the VRI website (<http://www.for.gov.bc.ca/hts/vri/intro/index.html>)

References

Johnson, M. 1992. Lore: Capturing Traditional Environmental Knowledge. IDRC:
Ottawa, Canada. p. 4.

Star, J., and Estes, J. 1990. Geographic Information Systems: An Introduction. Prentice- Hall:
Englewood Cliffs, NJ. pp. 2-3.