

# Written Project Summary Report

Project title: **Sahtu-Specific Development Density Plan**

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## **Deliverables**

### *Summary*

The Sahtu-Specific Development Density Plan has progressed according to schedule and the conceptual framework for the plan has been established. A meeting in Norman Wells February 28<sup>th</sup>-March 1<sup>st</sup>, 2006, was successful in bringing the participants together and bolstering support for the plan amongst the group. Chief representatives from all three partner groups were present at the meeting, as was the project lead, Ruairaidh Carthew. Main strategies for the plan were discussed here and approved in a collaborative process. Work continues to refine the main components of the plan, and to accumulate material through literature review. This work will be written up and circulated amongst the partners for approval in time for the original deadline date of May 15<sup>th</sup>, 2006.

## **Project overview and Conceptual Framework for the Sahtu-Specific Development Density Plan**

The *Sahtu-Specific Development Density Plan* (SSDDP) is an initiative being developed to deal specifically with cumulative effects. The SSDDP is supported by the Sahtu Renewable Resources Board (SRRB), the Sahtu Land Use Planning Board (SLUPB), the Sahtu Wildlife Management division of the GNWT department of Environment and Natural Resources (ENR), and in collaboration with Ducks Unlimited Canada (DUC)<sup>1</sup>.

The goal of the SSDDP is to reverse the scope of analysis for development projects from a closed system (one that looks only at each project) to an open system (one that considers the wider implications to the Sahtu as a whole). The SSDDP would create an open system of analysis by determining the maximum level of natural disturbance tolerable to residents of the Sahtu Settlement Area (SSA) and converting this figure into a density formula. Key harvesting species will be used to determine acceptable threshold values because of their dual role as cultural and environmental health indicators.

The plan would work by determining what area of undisturbed habitat is necessary for each species identified by the SRRB to survive without a loss to species survivorship or health. Tiered thresholds for habitat quality will be used to limit the extent of cumulative effects from development activities. Three variables of analysis

<sup>1</sup> A partner sharing agreement is currently being negotiated with Ducks Unlimited Canada and the Sahtu Renewable Resources Board, the Sahtu Land Use Planning Board, and the Wildlife Division of the Sahtu-ENR in conjunction with the SSDDP.

will be used in determining the area of habitat necessary for prime Sahtu VECs: (1) earth-vegetation GIS imaging; (2) scientific data on Valued Ecosystem Components (VECs) ranges and movement patterns; and (3) Traditional Knowledge related to land use and health indicators.

New advances in technology have allowed for detailed information to be gained from satellite imaging. Until recently, GIS images of ground cover were too vague to accurately differentiate between plant species on the ground. The wetlands conservatory group Ducks Unlimited has advanced the imaging possibilities of this technology to better document and quantify waterfowl population numbers and habitat sources. By using Ducks Unlimited's new technology, it is possible to determine the vegetative ground cover of a region. Collaboration to share this information is currently being worked out between the SSDDP partners and DUC. With it, it is hoped that the habitat potential of certain herbivorous species (e.g. caribou, moose, and migratory birds) - based off of availability of food sources- can be determined within the SSA.

One of the limitations of working in the Sahtu is the limited availability of regional studies on important VECs. The one exception is for caribou, (*Ranger tarandus caribou* and *Ranger tarandus groenlandicus*), for which a comprehensive data set exists that monitors movement rates and high-use areas. Because caribou are such an important species for the people of the Sahtu, their use as a prime threshold indicator is acceptable. Other scientific data that will be considered in the creation of thresholds for the Sahtu will stem from studies conducted in southern Canada, with particular reference to road densities and linear disturbances. Of particular importance will be replicating these studies in the Sahtu to account for regional differences.

Traditional Knowledge (TK) is a valued and valid form of science in the Sahtu, and in most of northern Canada (Dene Cultural Institute 2005; MVEIRB 2006; GNWT 2005). There is a strong correlation between traditional land use areas and the region's attractiveness to particular species (e.g. hunters go where the animals are, therefore one can expect that a popular fishing camp will have many fish). Comprehensive studies have been done in the Sahtu to map the traditional land use areas (Auld and Kershaw 2005, pg 14; SRRB 2006). The popular areas for specific VECs can be added into a more complex map that contains the movement patterns and vegetation data.

TK is also important in assessing the current health and state of the Sahtu's social-ecological system. In this sense, TK fulfills the multi-disciplinary role that an adaptive management plan should exhibit. The Dene people of the Sahtu Settlement Area exhibit the traditional worldview that human and natural systems are one. For the SSDDP, local beneficiaries were interviewed to gauge their level of acceptance for a more comprehensive resource management plan, input on the selection of appropriate indicators, priorities for regional development, and strategies for change. This information will eventually be incorporated into the SSDDP as supporting material in the establishment of thresholds in the Sahtu.

Further TK use will revolve around the issue of future harvesting practices. Any resource management plan that is created in the Sahtu must contribute to the preservation of important harvesting species. With the increasing changes resulting from development and climate change, the health of important species is no longer certain. In the interests of ensuring the healthy survival of these species, harvesting limits will likely need to be imposed. Initial interviews have already showed support for this idea, and the appropriate harvest number must be incorporated into the final density formula.

By combining the three variables of analysis, a clearer picture will emerge that shows the historical and current distribution of caribou in the Sahtu. The addition of the vegetative data allows planners to determine how much of a correlation there is between plant type and the presence of caribou. A high degree of correlation would give a tool for planners to determine the habitat potential of a region. Once the habitat potential of a region is determined, tiered thresholds can be established by the Sahtu people to determine an appropriate level of social-ecological disturbance. The footprint of future development activities in the Sahtu could then be cross-referenced with the region's habitat potential to determine the general level of disturbance that the development might have.

Determining the habitat potential is key to the Sahtu-Specific Development Density Plan as it provides a valuation system for the entire Sahtu Settlement Area. Most social-ecological systems are only vaguely understood by science, and the ability to predict on trends is declining proportionately with the rate of change these systems are experiencing. With caribou, the complete migratory and population cycle is not understood by ecologists, and is expected to span anywhere from 50-100 years (in conjunction with lichen population fluctuations) (Berkes 1998:98). Growing

environmental pressures (e.g. climate change) and land pressures from development have already caused shifts in caribou movements (GLL 2005; CARC 2005) and are likely to cause more under future disturbance scenarios. Reliance on oral histories and scientific data at such a time would be a gamble, as their previous experiences provide no reference to the changing social-ecological conditions. In contrast, a habitat potential for caribou in the Sahtu would show where the food sources are - food being a constant requirement over time- and thus where caribou movements are constrained. By creating tiered-thresholds to ensure a high quality of available habitat and habitat reserves, the SSDDP aims to increase the resilience of caribou in the Sahtu in the face of disturbance pressures. As caribou are large, sensitive migratory mammals (Salmo 2004), and a keystone species in the Sahtu, maintenance of their habitat quality would also preserve the habitat of numerous smaller and less motile species.

Given a successful ability to map habitat potentials, the establishment of actual threshold values would be necessary. Veitch, 2006, identifies road densities as being prime indices for the presence of caribou, an observation that is strengthened in Salmo's 2004 report (p. v, pp.66-72). Studies need to be done in the Sahtu to determine the degree of sensitivity, but once done, the establishment of tiered thresholds of road density and linear corridors would be logical suppositions in high quality habitat areas. The political process of establishing thresholds is more complicated, and will be addressed in the final report.

When the thresholds for caribou are calculated and applied, the SSDDP will still be incomplete. Several VECs were identified by the Sahtu Renewable Resources Board and Renewable Resource Council from Gartner Lee Ltd.'s recent work on harvesting issues (2005). Science will have to catch up with TK in the Sahtu in mapping the movement patterns of these various species, amongst which birds and fish are represented.

The earth-vegetation cover data available through DUC is a further limit to the scope of assessment for the plan, as the imaging has been done over prime wetland areas of the Mackenzie Valley only. Although this makes up a large portion of the Sahtu Settlement Area, it fails to cover important montane and boreal ecozones. Future efforts will need to be done to correlate high-quality vegetation imaging with each of the ecozones represented in the SSA.

The final step to creating the SSDDP is entrenching it into legislation. As is seen from Boyd (2004) and Kennett (2006), environmental regulations without legal enforcement are effectively useless. The Sahtu Land Use Planning Board, one of the affiliated partners in the development of the SSDDP, is in the process of creating a Land Use Plan for the SSA. Once finalized, this plan will detail the licensing requirements for all future land and water developments in the region. Although the plan is far from completion, the support expressed by the SLUPB offers hope that the SSDDP can be incorporated, in principle, into elements of the permitting process. Should the SSDDP become incorporated, any subsequent organization wishing to develop in the Sahtu would have to show that their development would not exceed the disturbance footprint allocated by the agreed-upon thresholds before any development disturbances could occur. A permit-based development density plan would serve as a preventative measure to ensure ecological health.

### **Accounting of project funds**

The entire budget was spent and accounted for during the course of the SSDDP's development. The bulk of the expenses were used up on the meeting in Norman Wells, and subsequent trip to the SRRB's main office in Tulita (e.g. travel, accommodations, meals). A smaller portion of the budget will go towards printing and dispersing the final document. The remaining funds were given out as payment for consulting services.

A full account of the budget will be provided but is regrettably unavailable at this time due to unforeseen circumstances. The Executive Director of the SRRB, and individual entrusted with the CIMP funds, was forced from the office recently on a family emergency. It is not known at what time she will be back in the office in a working capacity. Efforts are being made to attain copies of the accounting expenses for this project, but delays are anticipated.

## Contact Information

Please direct any further questions, concerns, or information requests to:

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## References

- Auld, J. and R. Kershaw (Eds.) (2005). *The Sahtu Atlas: Maps and stories from the Sahtu Settlement Area in Canada's Northwest Territories*. Canada: Friesens.
- Berkes, F. and C. Folke (Eds.) (1998). *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge: Cambridge University Press.
- Boyd, D. (2003). *Unnatural Law: Rethinking Canadian Environmental Law and Policy*. Vancouver: UBC Press.
- Canadian Arctic Resources Committee (2005). Mapping Study of the Cumulative Effects of the Mackenzie Gas Project. CARC: Yellowknife, NWT. Available online: retrieved 27.02.2006 [http://www.carc.org/2005/mapping\\_cumulative.htm](http://www.carc.org/2005/mapping_cumulative.htm).
- Dene Cultural Institute (2005). Traditional Knowledge Research and Policy Development. Available online. Retrieved 27.03.2006: [http://iggi.unesco.or.kr/web/iggi\\_docs/06/952477863.pdf](http://iggi.unesco.or.kr/web/iggi_docs/06/952477863.pdf).
- Gartner Lee Limited (GLL) (2005). Key Harvesting Issues Pertaining to the Mackenzie Gas Project. Prepared for the Sahtu Renewable Resource Board, August 2005. Tulita, NWT.
- Government of the Northwest Territories (GNWT) (2005). Northwest Territories Policy 52.06: Traditional Knowledge. Available online: Retrieved 27.03.2006 <http://www.enr.gov.nt.ca/plc/pdf/Traditional%20Knowledge%20Policy%20-%20FINAL.pdf>.
- Kennett, S. (2006). "From Science-Based Thresholds to Regulation Limits: implementation issues for cumulative effects management." Canadian Institute of Resources Law: Prepared for Environment Canada, Northern Division.
- Mackenzie Valley Environmental Impact Review Board (MVEIRB) (2005). Rules of Procedure for Environmental Assessment and Environmental Impact Review Proceedings. MVEIRB: Yellowknife.
- Sahtu Renewable Resources Board (SRRB) (2006). Sahtu Harvest Study. SRRB, Tulita. Available online: Retrieved 27.03.2006 <http://www.srrb.nt.ca/harstudy.html>.
- Salmo Consulting Inc. (Salmo) (2004). "Deh Cho Cumulative Effects Study: Phase 1- Management Indicators and Thresholds." Prepared for the Deh Cho Land Use Planning Committee, April 2004. Fort Providence, NWT.
- Veitch, A. (2006). *Personal Communication*. Department of Environment and Natural Resources, Sahtu Wildlife Division: Norman Wells, NWT.