Interim Project Report 2013

1. **NWRT Project Number:** **2-13-14**

2. **Project title:** **Estimation of population size for wolverines *Gulo gulo*, in the vicinity of Baker Lake, using DNA based mark-recapture method**

3. **Project Leader**:

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4. Summary:

In Nunavut wolverine is listed both as furbearer (Schedule 5.2) animal and a big game (Schedule 5.1) under NLCA, and is an important cultural and economic resource for people. The Committee on the Status of Endangered Species in Canada (COSEWIC 2007) has listed the western Canada population, including Nunavut, as "Special Concern." Potential cumulative direct and indirect effects from human development in tundra have escalated concerns about the species, and emphasize the need to estimate their abundance, monitor the trend and support a Total Allowable Harvest (TAH) decision. By involving local hunters, snagging hair samples and identifying individuals using DNA, the purpose is to use non-invasive sampling protocol to establish baseline wolverine population data ("natural" wolverine density in the areas with limited or no harvest pressure). In the spring of 2013, 209 baited posts wrapped with barbed wire were deployed in a 3,344 km^2 study area (4 X 4 km cells). The posts were visited using a snowmobile and checked 3 times at approximately 10-day intervals. A total of 871 samples (845 hairs and 26 scats) were collected at the posts. Initially, we analyzed one sample/post/session, 224 hair samples genotyped at 7 microsatellites loci and assigned to 17 individual wolverines (8F,9M). Another sampling session will be repeated in the spring 2014 following the same study design.

5. Project Objectives:

Our wolverine carcass collection program and this research proposal is designed to investigate the ecology and to estimate wolverines density and abundance in the Kivalliq region based upon a DNA sampling grid located near Baker Lake, Nunavut. The specific objectives are:

- To determine wolverine density;
- To establish baseline wolverine population data which can be used for population monitoring in the long term and to support a TAH decision;
- To determine wolverine landscape use and movements through genetic mark-recapture;
- To provide field work training and employment to HTO members and
- Increase collaboration between government and resource users.

6. Materials and Methods:

The proposed two year study was initiated in March 2013 on the mainland, 130 km northwest of Baker Lake, Nunavut (Fig 1). The study area covers 3,344 km^2 and was identified using elders/hunters knowledge about abundance, habitat use, harvest patterns and distribution of wolverines and their prey.

This study was designed to involve local hunters in the collection of samples. In the spring of 2013 three Baker Lake HTO members were hired to be part of the field work. A total of 209 bait posts were deployed in the centre of 4 X 4 km cells. Each hair snare bait post consists of ~ 1.6m long spruce post wrapped with barb-wire and anchored in packed snow. Bait (caribou meat) and a combination of commercial lures were attached on the top of the post. A GPS position of each bait post was recorded. Each post was visited 3 times at about 10-day intervals using snowmobiles. At each visit all visible hairs and wolverine scats were collected and the wood post was cleaned using a propane torch to remove any remaining hair. Each individual clump of hair was removed from the post and placed in labeled individual coin envelopes (post number, location on post and date) for storage. A fresh set of bait and lures was installed on each post after every check.

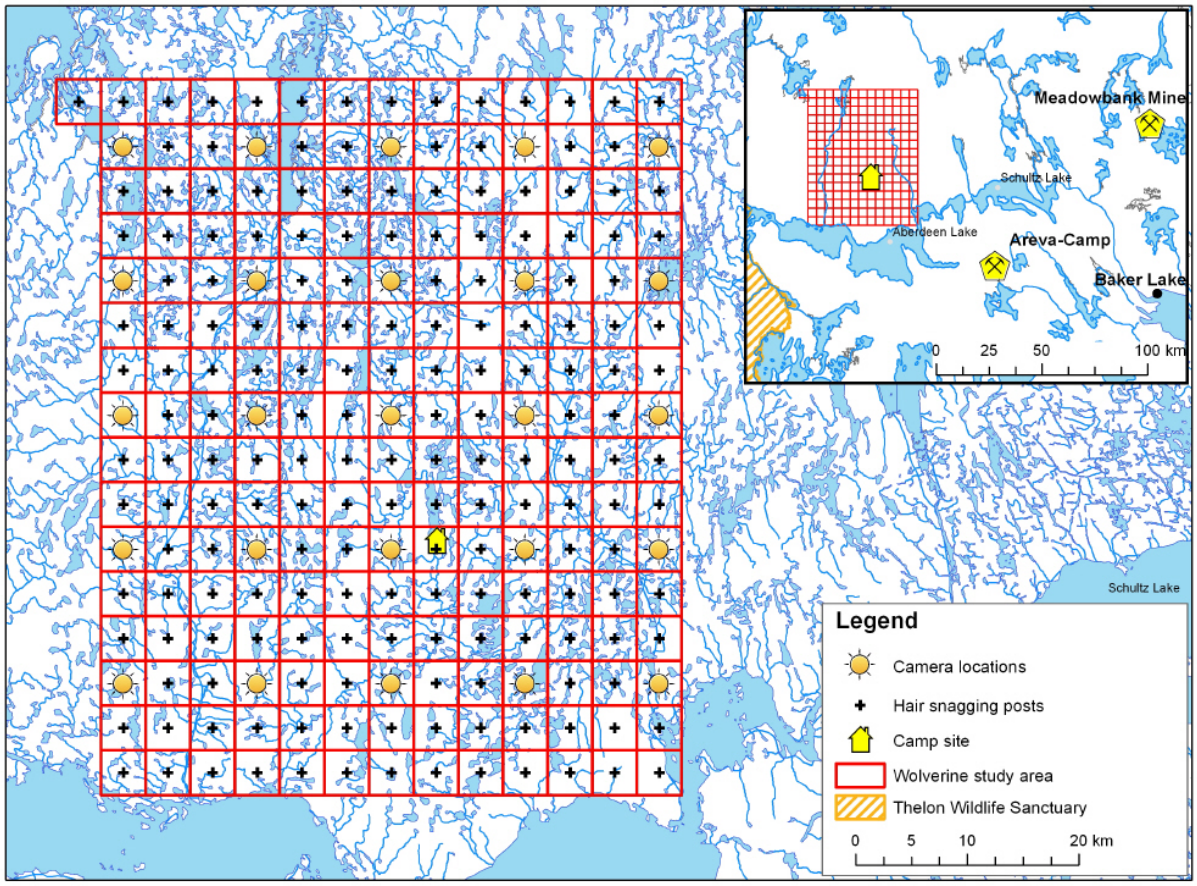

Fig. 1: Study area (3,344 km^2) with 209, 4X4 km cells.

After the 3rd (last session) check, in early May 2013, posts were dismantled and stored at one location for next year use. A total of 25 motion triggered digital cameras (Reconyx PC-800 Hyperfire Professional IR) were installed at the sampling grid (Fig 1), to document wolverine and other wildlife activity around the hair snagging post. Upon the end of the field season, the samples were sent to Wildlife Genetics International Lab, Nelson, BC for individual wolverine identification.

7. Project Schedule:

Considering the relatively low density of wolverines on the eastern mainland (Kivalliq) more than a single year of study may be required to obtain estimates of suitable precision. To intensify the initial sampling effort we proposed conducting multiple sampling sessions (3 sessions) each year, for two years.

A future objective of this project is to monitor trend through sampling in additional years. We'll collect supplemental data on musk ox and caribou while checking the posts during the survey. The hunting pressure and prey abundance covariates measured on the sampling grid will be used for trend monitoring studies once multiple years of data is collected.

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Output or Step	**Start Date**	**End Date**	**Person days**
Wood posts and barb wire	Completed	Already on the site	
Community consultations,	Completed		
Delivery of fuel and gear to camp location	March 03, 2014	March 14, 2014	8
Deployment of posts, and hair capture sessions (3 sessions)	March 2014	April 2014	240 per year
Collection of samples from harvested animals			On Going
Genetic and data analysis, Report preparation	May 2014	Nov 2014	40
2nd year report to DOE, NWMB, HTOs	Nov 2014	Jan 2015	20

8. **Preliminary results/discussion**:

In the spring 2013, a total of 871 samples (845 hairs and 26 scats) were collected during the three post checking sessions. The number of posts where a hair sample was found increased from session one through three (Table 1).

Table 1: Number of posts with hairs by session.

Session	Posts with hairs	Proportion of posts with hairs
1	72	34%
2	107	51%
3	134	64%

Initially, we had analyzed one sample/post/session. A total of 224 hair samples were genotyped at 7 microsatellites and assigned to 17 individual wolverines (9M; 8F). Out of those 17 individuals 10 were captured in all 3 sessions and 13 were captured at multiple session/post combinations. These 17 individuals were all unique to this study area and were not identified in any other hair snagging study area on the barren ground. The one sample/post/session sub-selection rule excluded 43% samples from the first round of analysis. To increase the chances of detecting additional individuals we decided to extract and genotype one more sample/post/session.

The analysis of additional hair samples is still ongoing and complete results of the genetic analysis will be available in spring 2014. To estimate wolverine density in study area we will use spatial mark-recapture methods based on our final genetic analysis data (i.e., number of capture, number of recaptures).

9. Reporting to Communities/resource users:

Preliminary results from first year (2013) study have been presented on October 29, 2013 at the Kivalliq Wildlife Board (KWB) AGM meeting and on November 18, 2013 to Baker Lake Hunters and Trappers Association (HTO). KWB and Baker Lake HTO supported the project for the year 2014.

Field Team:

Malik Awan	GN DoE
Guillaume Szor	GN DoE
Kenny Avaala	Baker Lake HTO member
Timothy Evviuk	Baker Lake HTO member
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