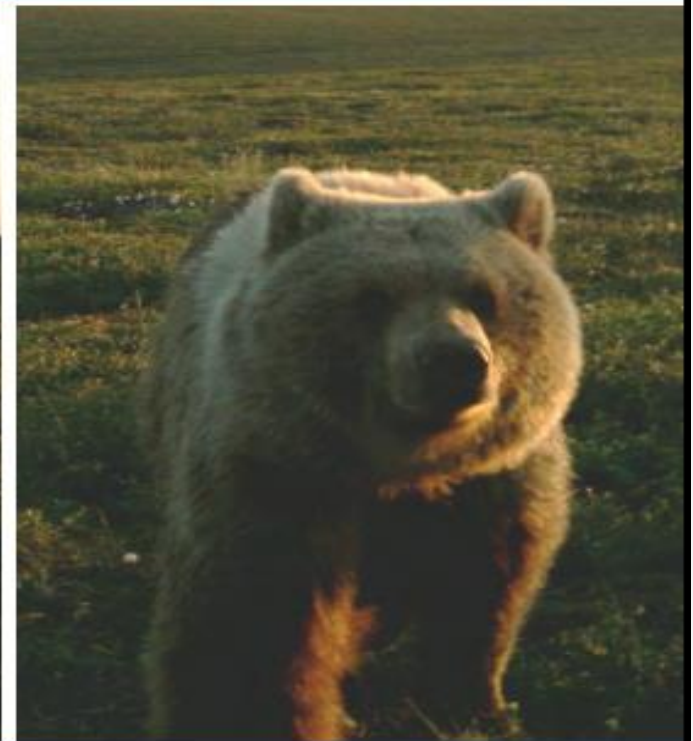


2013 WEMP Addendum – Wildlife Camera Monitoring Independent Environmental Monitoring Agency

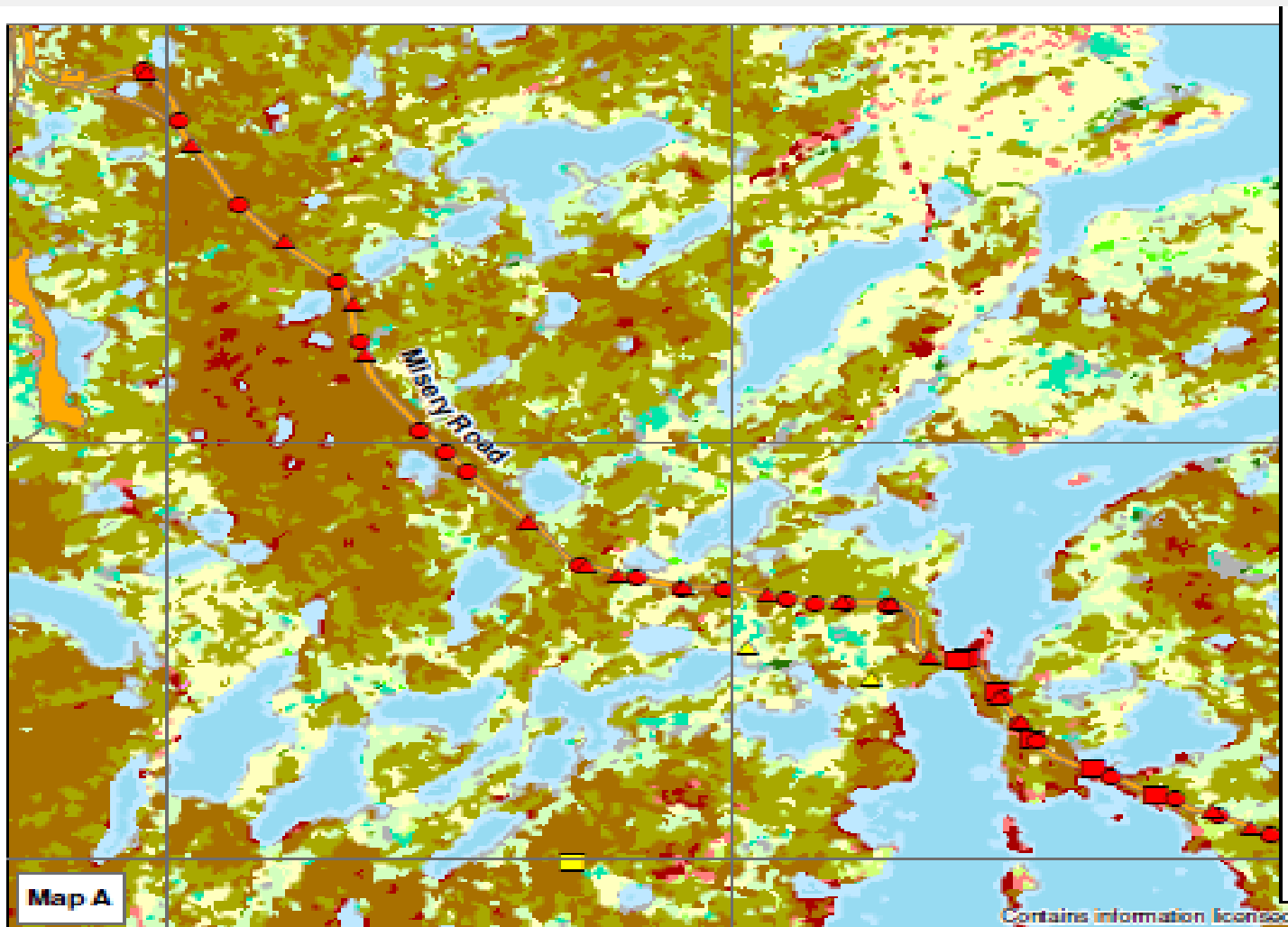


Department: Environment Operations
Developed by: Harry O'Keefe, Advisor - Wildlife
Last revised: December 3, 2014

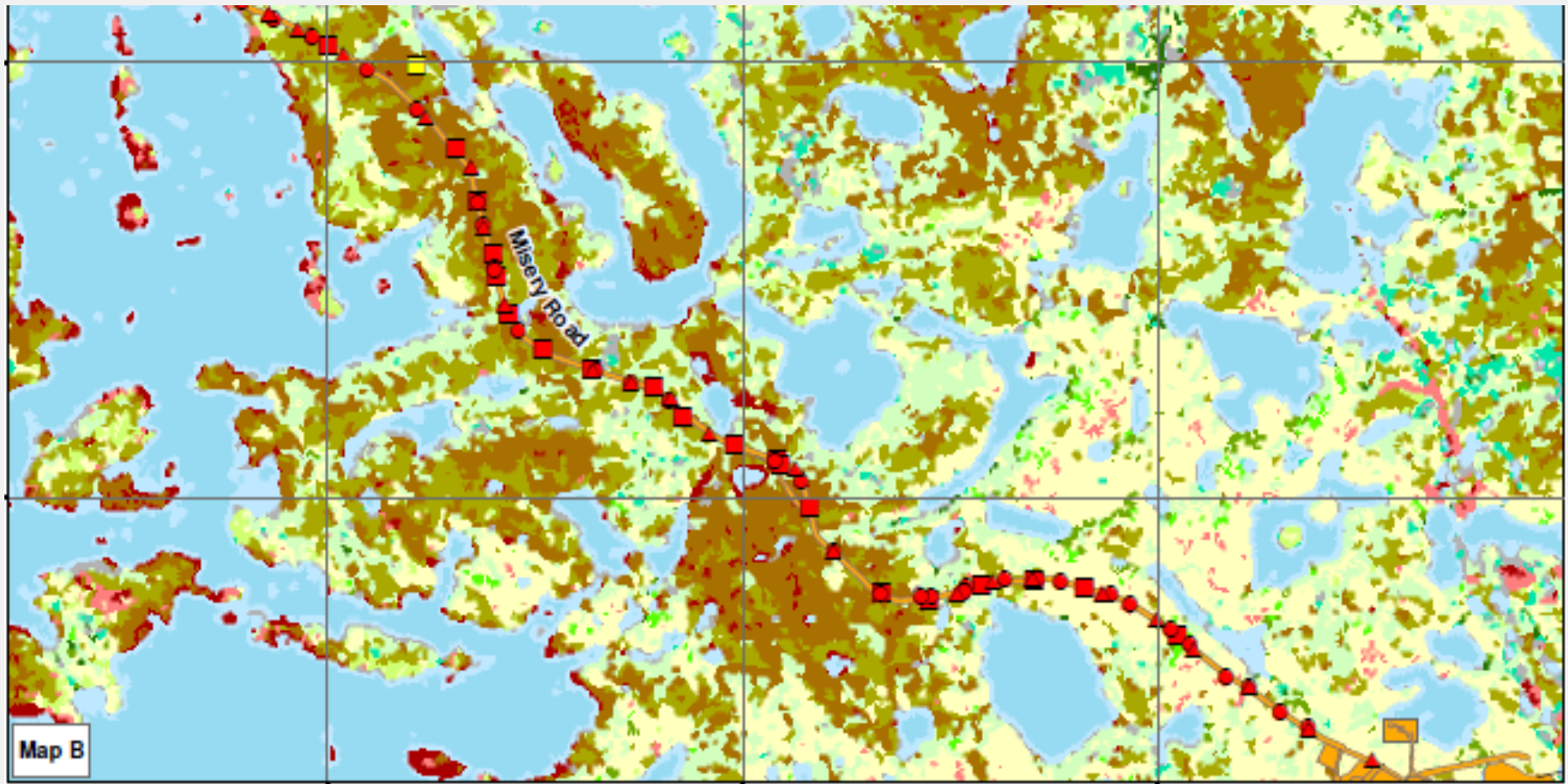
Deployment & Design



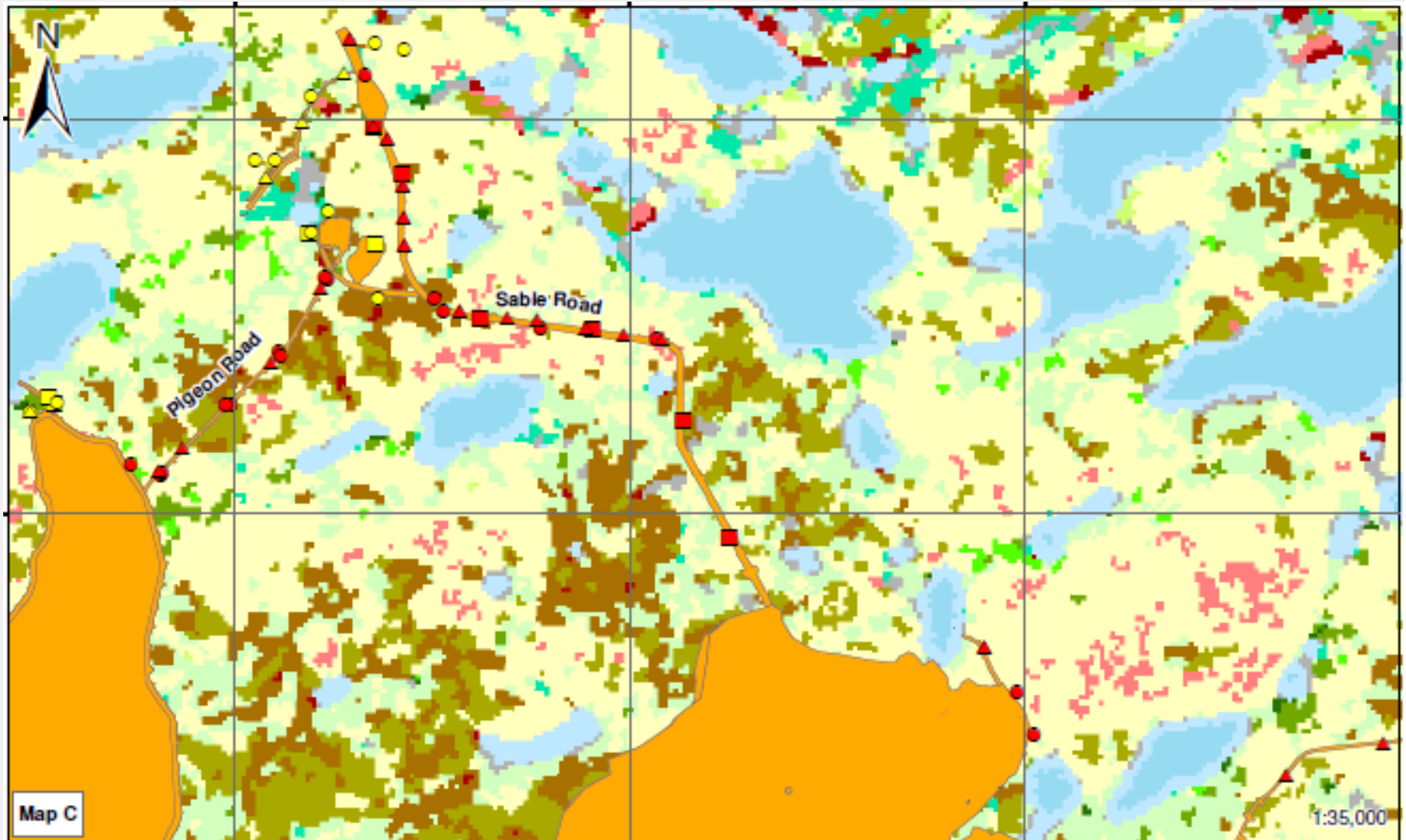
Deployment & Design



Deployment & Design



Deployment & Design



Objectives

1. **Determine and compare temporal trends in caribou abundance around Ekati;**
2. **Determine how the frequencies of behaviours exhibited by caribou groups varied near and away from the road;**
3. **Explore spatial and temporal patterns in road crossing behaviours;**
4. **Determine the extent that roads may deter caribou from crossing, and identify those factors that contribute to the permeability of site roads; and**
5. **Quantify traffic levels on Misery Road as a potential deterrent to caribou movement.**

Results Summary

Determine and compare temporal trends in caribou abundance around Ekati

- Caribou abundance recorded on cameras was consistent with data from GPS collaring studies and Traditional Knowledge, with a maximum abundance during late summer (August) and fall.

Year	Total Number of Groups Observed [#]	Total Number of Individuals Observed [†]	Total Camera-Days of Effort	Average Number of Groups/Camera/Day	Average Number of Individuals/Camera/Day
2011	137	336	4495	0.031	0.075
2012	256	1389	8542	0.030	0.163
2013	194	654	9059	0.021	0.072

- The largest encounter rate was at the north end of Main camp, at the Sable/Pigeon Road and Access Roads for total counts. The normalized data (corrected for effort) also indicate increased numbers of caribou at the Sable/Pigeon Road and Access Road area.

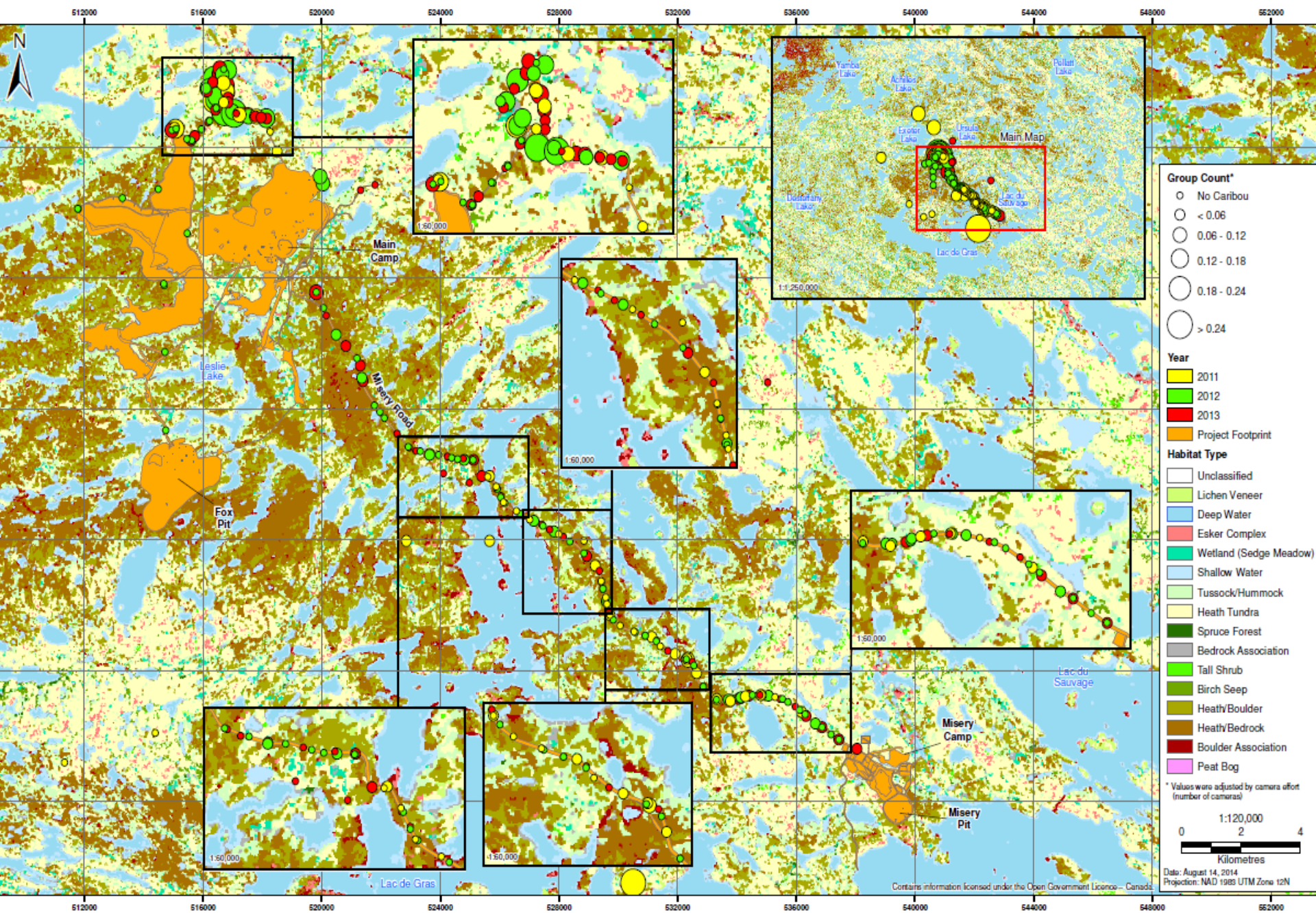
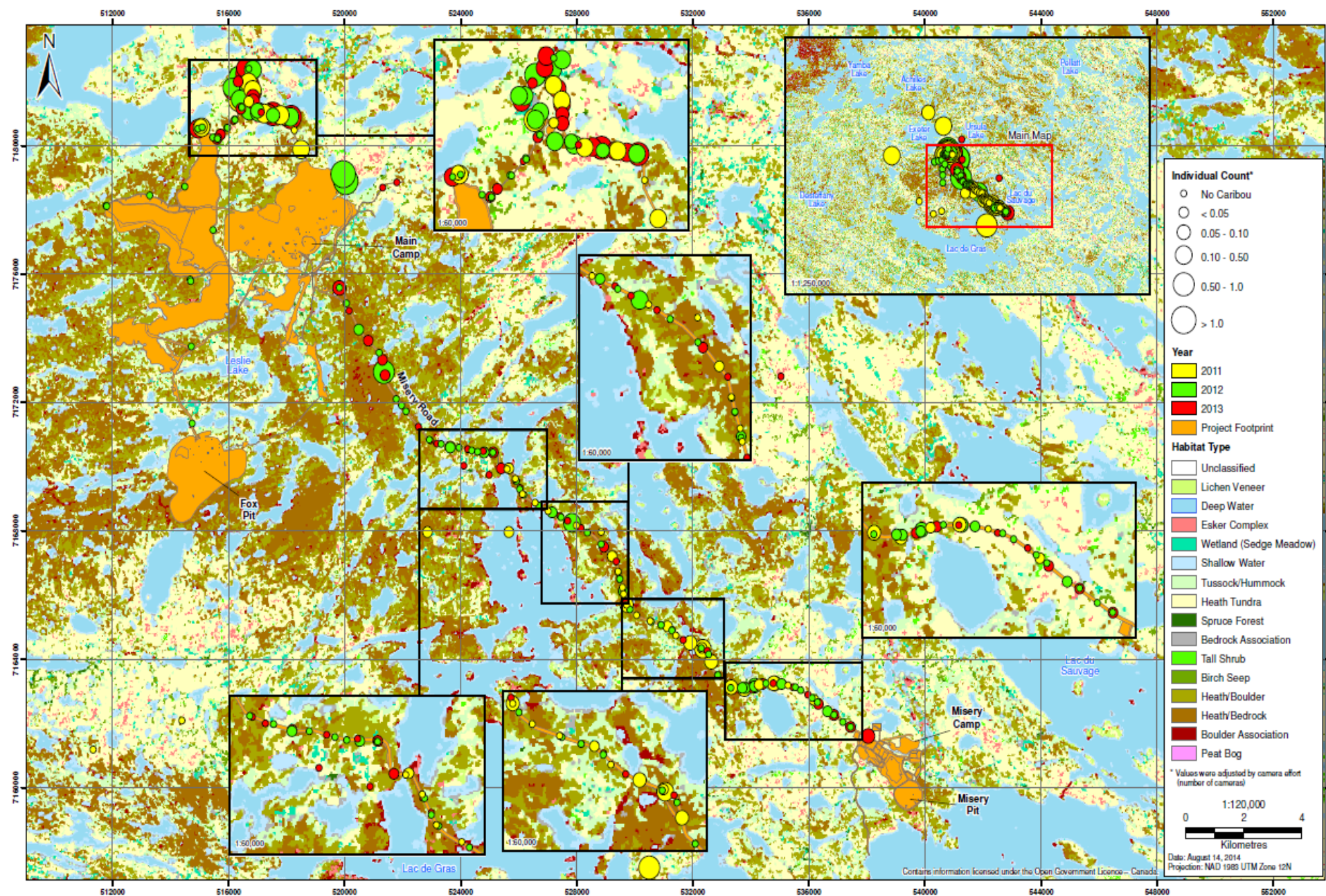


Figure 3.1-2
Number of Caribou Individuals per Group at the Ekati Diamond Mine, 2011 - 2013, Adjusted by Camera Effort



Key Results

Determine how the frequencies of behaviours exhibited by caribou groups varied near and away from the road

- Caribou behaviour did not vary between regions in a way that would suggest caribou have consistently different (more stressed versus less stressed) behaviours at different regions.

Sable Road:

Foraging, walking on and along the road, crossing and stopping behavior

PSD & Pigeon Fence:

Walking

Misery Road:

Had the lowest frequency of all above mentioned behaviors

Key Results

Explore spatial and temporal patterns in road crossing behaviours

- The most common behaviours at the group level at roads were foraging (135 observations), crossing or crossed the road running (15 observations), walking across/along roads (169 observations), and alert (88 observations).
- Statistical evidence was found for an effect of on-road and off-road locations on the frequencies of six behaviours at the group level; investigating camera, walking, standing, foraging, bedded, and calm behaviours.
- Deflections occurred infrequently at the Sable, Pigeon and Access Roads (near the main camp) and along the Misery Road.
- No effect of group size on susceptibility to heavy or light vehicle was detected (i.e., both large and small groups behaved similar to potential vehicles disturbances).



Key Results

Determine the extent that roads may deter caribou from crossing, and identify those factors that contribute to the permeability of site roads

- Observations of deterred road crossing were rare, representing less than 1% of observations of caribou groups, and individuals. In most cases, the deterrence could not be linked to a specific trigger such as a passing vehicle.



Key Results

Quantify traffic levels on Misery Road as a potential deterrent to caribou movement

- Traffic on Misery Road was relatively consistent between 2011 and 2012, but increased substantially during 2013. The camera effort adjusted number of caribou road crossings did not change with changes in yearly traffic volumes.
- Daily differences in traffic were substantial, but differences in traffic between days was not correlated with the number of caribou observations or the behaviour of caribou, suggesting that the road itself with vehicle traffic deters caribou from crossing the road at a very low rate (less than 1%).

2014 Camera Deployment

Assess the use of caribou ramps as caribou crossings, road features and habitat interactions related to caribou crossing, and caribou use in future development areas :

- 2 cameras in LLCF (cell B);
- 15 cameras in the Pigeon/Sable area (Spur Road, Grizzly Road, PSD Road);
- 5 cameras between 500 m – 3 km from Sable Road;
- 1 camera along proposed Lynx Road;
- 1 road traffic camera (in previous location);
- 14 remaining cameras:
 - caribou crossing ramps,
 - high berm areas along the new road alignment adjacent to good habitat,
 - Faye Bay,

Continued

- 30 cameras along Misery Road (~every 1-2 km) at high caribou activity areas (see comments on attached figure) with good quality habitat (i.e., few boulder fields):
 - focus primarily between Km 10-25,
 - pair these cameras at 10 locations along the road; i.e., one adjacent to the road, the other 200-500 m out from the road, depending on habitat,
 - as cameras are being placed along the road, record details about the berm, including:
 - Berm height,
 - Slope,
 - Composition (average boulder size),
 - Adjacent habitat,
 - Also record dominant (> 50%) habitat in 30 m radius around the paired tundra camera;

Camera Settings

To reduce photo processing without compromising data quality, the following settings are recommended:

- 1 timed photo per 30 minutes;
- 4 photos per motion trigger at 1 photo per second;
- no delay between triggers; and
- for the road traffic camera, 1 photo per trigger, with a 5 second delay between triggers.