

DATE January 18, 2011**PROJECT No.** 09-1422-5007/1000/1040**TO** David Harpley, P.Geo.
Canadian Zinc Corporation**CC** Alan Taylor, Doug Tate, Nic Larter**FROM** Daniel Guertin, Chris Schmidt**EMAIL** dguertin@golder.com, cschmidt@golder.com**CANADIAN ZINC CORPORATION – PRAIRIE CREEK MINE AND ACCESS ROAD DECEMBER 2010
WILDLIFE SURVEY**

This technical memorandum briefly summarizes the results of the first of three aerial surveys to be conducted on behalf of Canadian Zinc Corporation (CZN) in the vicinity of the Prairie Creek Mine site and access road during the time period from December 2010 to March 2011. This survey was conducted under Parks Canada Agency (PCA) research and collection permit NAH-2010-7252 and under Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR) wildlife research permit WL005033 (addressed to David Harpley of CZN). A complete description of survey methods and results will be provided in a report following completion of all three aerial surveys in the study area.

1.0 BACKGROUND

Canadian Zinc Corporation, based in Vancouver, British Columbia, has proposed to reopen the Prairie Creek Mine for production (the Project). The mine is located in the Dehcho region of the Northwest Territories (NT). The mine site is situated at approximately 61° 33' north latitude and 124° 48' west longitude adjacent to Prairie Creek, a tributary of the South Nahanni River. The Prairie Creek Mine site is located on land surrounded by the Nahanni National Park Reserve (NNPR). Approximately 80 km of the 174 km access road crosses the NNPR.

Golder Associates Ltd. (Golder) conducted an assessment of the potential effects on vegetation and wildlife of reopening the access route and bringing the mine into production, which was incorporated by CZN into its Developer's Assessment Report (DAR). Subsequent to submission of the DAR to the Mackenzie Valley Environmental Impact Review Board (MVEIRB), the DAR was reviewed by GNWT ENR and departments of the Government of Canada. During the review process, Parks Canada Agency (PCA) noted that, in their opinion, there were deficiencies with respect to wildlife survey data for the mine access road, specifically for the winter period. Of primary interest to PCA is the status of woodland caribou (*Rangifer tarandus*) along and adjacent to the mine access road, and the potential for impact to woodland caribou from use of the mine access road, specifically with respect to NNPR.

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2.0 OBJECTIVES

Parks Canada Agency has indicated that current knowledge of the winter distribution of caribou in the Project area is lacking from the perspective of impact assessment/mitigation. In fulfilment of its obligations under the SARA, PCA has requested that an occupancy survey be conducted to provide baseline information on the occurrence of caribou in proximity to the mine development and access road during winter. Therefore, the objectives of this winter survey are to:

- Identify areas of caribou winter use, including possible movement corridors in proximity to the mine development and access road alignment; and
- Provide information on the presence and distribution of caribou in the wider Project area during winter.

3.0 METHODS

A 9,261 km² study area surrounding the Prairie Creek Mine site and access road was delineated in consultation with GNWT ENR and PCA (Figure 1). The survey area was divided into a tessellation of 100 km² hexagons, and flight lines were established through the centre of hexagonal survey units according to the occupancy survey method described in Magoun *et al.* (2007) and Bowman *et al.* (2010) (Figure 1). Flight routes following the pre-determined flight lines were completed on December 10, 11, and 17, 2010 (Figure 2).

The survey was conducted using a Cessna 185 aircraft from Wolverine Air equipped with wheel-skis. All flights originated from Fort Simpson, NT. The survey crew consisted of a pilot (Garry Murtsell or Richard Taylor) and navigator/observer/recorder (Daniel Guertin [Golder] or Nic Larter [GNWT ENR]) in the front seats, and two local observers in the rear seats (Wilbert Antoine [CZN], Darrell Betsaka [Nahanni Butte Dene Band], or Peter Corneille [Liidlil Kue First Nation]). Data recorded during survey flights included the location of animal tracks, animal feeding sites, and observed animals. Observed animals were subdivided into calf and non-calf age classes with sex being recorded if possible. Photographs of observed animals were also obtained when possible.

Following the completion of the sub-regional survey on December 17, a reconnaissance level fly-over of the access road alignment was conducted by the same fixed-wing aircraft. The road alignment was flown from the south-eastern terminus to the mine site.

4.0 RESULTS

Approximately 8 cm of fresh snowfall on December 6 (Environment Canada's Canadian Daily Climate Data database; www.climate.weatheroffice.ec.gc.ca) prior to the survey provided ideal survey conditions. Flying conditions on December 10 and 11 were ideal for making observations throughout the entire study area (Table 1). Visibility was acceptable, but hindered by frosting on windows, a result of very low temperatures. A low pressure weather system moved into the region on December 12 and contributed to approximately 13 cm of snowfall in the study area until December 16 (Environment Canada's Canadian Daily Climate Data database; www.climate.weatheroffice.ec.gc.ca), resulting in poor flying conditions. Flying conditions were good on December 17 except for the formation of some minor ice crystals along some portions of the flight route, which partially obstructed clear visibility from the aircraft. Although these were not ideal conditions, they did not preclude observations of 1 km from the aircraft in any direction.

Table 1: Detailed Description of the 3 Flight Routes of the December 2010 Aerial Survey

Date	Departure Time	Flight Time (hr)	Weather at Departure	Snow Conditions	Total Flight Distance (km)
10 Dec 2010	10:48	4.6	-34°C, calm wind, scattered cloud (10%), good visibility (24 km)	100% cover, 15-30 cm, 4 days since last snow	640
11 Dec 2010	10:00	4.9	-29°C, SE wind (11 km/hr), broken clouds (80%), good visibility (24 km)	100% cover, 15-30 cm, 5 days since last snow	576
17 Dec 2010	10:00	4.4	-24°C, calm wind, scattered clouds (10%), good visibility (24 km)	100% cover, 15-30 cm, 1 day since last snow	630

Approximately 1,546 km of survey lines were flown over three days (Figure 2). A total of 62 caribou, 48 moose (*Alces alces*), 13 bison (*Bos bison athabasca*), and 7 Dall's sheep (*Ovis dalli dalli*) were observed during flights (Figures 3 to 5). Tracks of caribou ($n=13$), moose ($n=6$), grey wolf (*Canis lupis*; [$n=3$]), wolverine (*Gulo gulo*; [$n=2$]), red fox (*Vulpes vulpes*; [$n=1$]), and river otter (*Lontra Canadensis*; [$n=1$]) were also observed during survey flights. Caribou and caribou sign were detected in 10 of the hexagon survey units. Observed caribou were usually in groups (range 4 to 15 animals) with few lone individuals observed. No wildlife or wildlife sign was observed during the December 17, 2010 access road reconnaissance level fly-over.

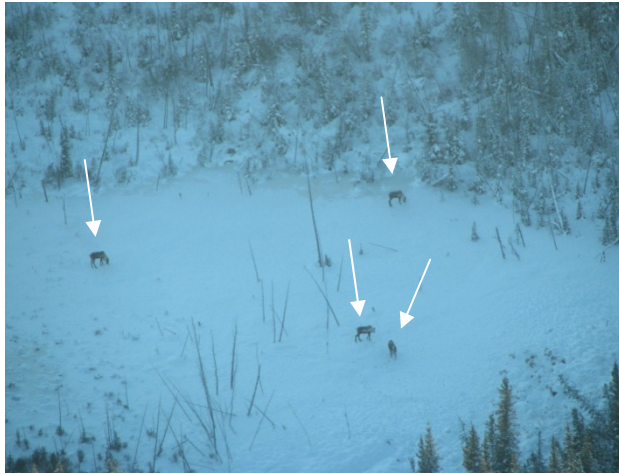
Representative photographs of wildlife observations recorded during the December 2010 surveys are included below:



Photograph 1: Group of caribou on mountain side (approximately 0.3 km from access road alignment).



Photograph 2: Group of caribou in Prairie Creek drainage (approximately 8 km from access road alignment).



Photograph 3: Group of caribou in boreal lowlands (approximately 5 km from access road alignment).



Photograph 4: Two male moose on mountain side.

5.0 SUMMARY AND CONCLUSIONS

Sunshine, calm winds, complete snow coverage, and recent snowfall provided good to excellent flying and observing conditions during this survey. In general, caribou and caribou sign was present among the hills and higher elevations of the survey area, with moose and moose sign primarily occurring in lower elevations. Plotting of location data obtained for caribou show that most caribou and caribou sign was observed in the western portion of the study area, in particular the Prairie Creek drainage and surrounding areas in the Mackenzie Mountains. One group of four caribou was observed in boreal lowland habitat east of the Mackenzie Mountains.

No wildlife or wildlife sign was observed during the access road reconnaissance level fly-over conducted on December 17, 2010. While some animals were observed in the larger study area on the same day, fresh snowfall from December 12 to 16 may have covered recent tracks.

This survey, in conjunction with two additional surveys to be completed by March 31, 2011, will be used to estimate the probability of occurrence of caribou in the study area.

6.0 CLOSURE

We trust that the preliminary findings presented in this technical memorandum are sufficient for your requirements. If you have any questions, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

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7.0 REFERENCES

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