



SUMMARY OF BASELINE WILDLIFE SURVEYS CONDUCTED

1994 TO 2012

June 2013

Prepared for:

MINTO EXPLORATIONS LTD.

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1 INTRODUCTION

Minto Mine is an operating high-grade copper and gold mine that is located 240 km north of Whitehorse, Yukon. Mining and milling operations started in 2007; from 2007 to 2012 the ore supply was drawn from one main pit. As the main pit ore supply has been exhausted, other sources north and southeast of the main pit are now being opened for ore extraction. In preparation for this expansion (Phase V/VI), environmental reports are being inventoried to see if there is adequate and up-to-date information. This report will summarize the results of wildlife surveys conducted in the area to date, identify species of concern, and list ongoing and/or near-future surveys to be completed.

The last update on the number and types of wildlife studies that have been conducted in the Minto Mine area was in a comprehensive 2010 report produced by EBA Engineering Consultants Ltd (EBA), titled *Minto Mine, Environment Baseline Report-Wildlife* (EBA 2010b).

2 PROJECT SITE AND ENVIRONMENTAL SETTING

The Minto Mine is located within the Boreal Cordillera ecozone and in the western part of Yukon Plateau Central ecoregion (Smith et al. 2004). The Minto Mine is situated in the far western part of the Yukon Plateau-Central ecoregion near the Dawson Range and adjacent to the Klondike Plateau ecoregion in the west. The area was part of the eastern extent of Beringia, which remained ice-free approximately twenty to fifteen thousand years ago during the last maximum glacial period (Smith et al 2004).

The Minto Mine is in the eastern part of the Dawson Range where the local elevation ranges from 700 m to 950 m; the general landscape is composed of rounded mountains intersected by broad valleys and drainages that flow into the Yukon River. The access road starts on the western side of the Yukon River, at the barge landing site, continues north along the Yukon River and then turns southwest up the Minto Creek valley for 12 km to reach the Minto Mine site.

Forest fires are frequent in this region as less than 300 mm of precipitation falls per year due to the rain shadow formed by the St. Elias-Coast Mountains in the west. As a result, the study area around Minto Mine has experienced numerous fires over the last thirty years, rendering it a complex mosaic of plant communities at various stages of succession. The oldest pertinent fire burned approximately 7,236 ha in 1980, the second and more extensive fire occurred in 1995 and burned approximately 55,521 ha (GYWFM 2012). The 1995 burn occurred along the access road by the Yukon River barge landing and just west of the airstrip as shown in Figure 1. The most recent fires occurred in 2010 and 2011. These small fires only consumed 17 hectares within the Minto claims, southeast of the airstrip.

The fire-disturbed areas are now regenerating and young forest or shrub ecosystems dominate the Minto area (Oswald and Brown 1990). Willows (*Salix sp.*) and trembling aspen (*Populus tremuloides*) are the most represented species in crown cover at present. Lodgepole pine (*Pinus contorta latifolia*) is a later successional species and will gradually dominate well-drained mid and upper slopes. Shade-tolerant white spruce is the regenerating climax tree species currently found in the understory as seedlings. White spruce will eventually overgrow the pine and trembling aspen communities. Black spruce (*Picea mariana*) is also a climax species that is adapted to wetter, cooler sites, and is often the persistent species in white/black spruce-mixed areas along slope toes, valley bottoms, and northern aspects. Small grasslands are scattered along dry crests and steep south-facing slopes, these locations do not retain enough moisture to sustain tree growth.

The diversity of vegetative communities and successional stages around the Minto Mine provides a variety of habitat niches that support approximately 46 species of mammal (insectivores, bats, lagomorphs, rodents, carnivores, and ungulates), 60 species of birds, and one species of amphibian, the wood frog (*Rana sylvatica*). The list of mammals and bird species known to exist in the Minto area and/or the Yukon Plateau-Central ecoregion is included in EBA's 2010 baseline report (EBA 2010b).

3 WILDLIFE BASELINE ASSESSMENTS

Table 3-1 lists the wildlife surveys and studies that have been conducted since 1994 in the Minto mine area.

Table 3-1: Wildlife Surveys and Studies Undertaken in the Minto Project Area.

Dates	Type of Survey	Conducted By
Jan-March 2012	Late Winter Ungulate Studies	Environmental Dynamics Inc (EDI), Environment Yukon
Fall 2012	Klaza Caribou Herd Study	Environment Yukon
March 2011	Late Winter Ungulate Study	Environment Yukon and EDI (on behalf of Casino Mining Corporation)
July 2010	Baseline Ecosystems and Vegetation Report	Access Consulting Group
February 2010	Late Winter Moose Survey (Aerial)	Access Consulting Group
December 2009	Post-rut Moose Survey (Aerial)	Access Consulting Group
June 2009	Dall Sheep Survey (Aerial)	Environment Yukon
2007	Moose Survey	Environment Yukon
2003	Klaza Caribou Herd Survey	Environment Yukon
1994	Spring Wildlife Survey Spring Dall Sheep Survey Summer Raptor Survey Summer Wildlife Ground Pellet Survey	Hallam Knight Piesold Ltd.

The three most recent wildlife baseline studies were led by Yukon Government (YG) and were not designed specifically for the Minto mine properties. These studies encompassed the large Carmacks West Moose Management Unit and the Klaza caribou herd range, for a total area of 6,430 km² which overlapped the Minto site. The results from the YG survey, when released, will provide more statistically sound estimates of population levels, gender ratios and recruitment success for the overall region. These values can then be used as means of gauging how Minto resident ungulate populations are faring. Also, the locations of sightings when mapped, show distribution and help detect high value habitat that may require protection as mine and road development increases.

The 2010 Baseline Ecosystems and Vegetation Study (Access Consulting Group (ACG) 2010) was not primarily focused on wildlife; however, general wildlife observations were made during the vegetation survey, recorded on plot data sheets and wildlife mitigation recommendations were included in the report.

4 WILDLIFE SPECIES OF CONSERVATION CONCERN IN YUKON

The Minto Mine and surrounding environment provide habitat for several species considered at risk by both the federal and territorial governments. Table 4-1 lists species that have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or Yukon Government as needing special attention and protective legislation, so that remaining populations are not unduly stressed. The year in which the animal species was deemed a certain status by COSEWIC or YG is indicated in the right column. The list below only includes species whose range overlaps the Minto mine area.

Table 4-1: Wildlife Species of Conservation Concern in Yukon.

Species	Status*	Source
Little Brown Bat (<i>Myotis lucifugus</i>)	Endangered	COSEWIC (2012)
Common Nighthawk (<i>Chordeiles minor</i>)	Threatened	COSEWIC (2007)
Olive-sided Fly Catcher (<i>Contopus cooperi</i>)	Threatened	COSEWIC (2007)
Barn Swallow (<i>Hirundo rustica</i>)	Threatened	COSEWIC (2011)
Canada Warbler (<i>Wilsonia canadensis</i>)	Threatened	COSEWIC (2008)
Peregrine Falcon (<i>Falco peregrinus anatum - tundrius</i>)	Special concern	COSEWIC (2007), Yukon Wildlife Act (2002)
Short Eared Owl (<i>Asio flammeus</i>)	Special concern	COSEWIC (2008)
Wolverine (<i>Gulo gulo</i>)	Special concern	COSEWIC (2004)
Grizzly Bear (<i>Ursus arctos</i>)	Special concern	COSEWIC (2009)
Woodland Caribou (<i>Rangifer tarandus caribou</i>)	Special concern	COSEWIC (2002)
Collared Pika (<i>Ochotona collaris</i>)	Special concern	COSEWIC (2011)
Rusty Blackbird (<i>Euphagus carolinus</i>)	Special concern	COSEWIC (2006)
Gyr Falcon (<i>Falco rusticolus</i>)	Specially protected	Yukon Wildlife Act (2002)
Trumpeter Swan (<i>Cygnus buccinator</i>)	Specially protected	Yukon Wildlife Act (2002)
Mule Deer (<i>Odocoileus hemionus</i>)	Specially protected	Yukon Wildlife Act (2002)
Cougar (<i>Puma concolor</i>)	Specially protected	Yukon Wildlife Act (2002)
Bank Swallow (<i>Riparia riparia</i>)	Conservation concern	Yukon Environment (2011)
Northern Shrike (<i>Lanius excubitor</i>)	Conservation concern	Yukon Environment (2011)
Mountain Goat (<i>Oreamnos americanus</i>)	Conservation concern	Yukon Environment (2011)

* Status designations by COSEWIC are defined as:

Extinct - A wildlife species that no longer exists.

Extirpated - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

Endangered - A wildlife species facing imminent extirpation or extinction.

Threatened - A wildlife species that may become endangered if factors leading to its extirpation or extinction are not reversed.

Special Concern - A wildlife species that may become threatened or endangered because of its biological characteristics combined with environmental impacts.

Yukon Wildlife Act provides more legal protection for those wildlife species recognized as Specially Protected. Yukon Environment wildlife species of Conservation Concern are populations that are decreasing and require more monitoring.

There are currently 11 wildlife species in Yukon, rated in 2012 as threatened or of special concern by COSEWIC. Ten of those species have ranges that could possibly encroach upon the area around Minto Mine: grizzly bear (*Ursus arctos*), woodland caribou (*Rangifer tarandus caribou*), wolverine (*Gulo gulo*), collared pika (*Ochotona collaris*), bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), rusty blackbird (*Euphagus carolinus*), olive-sided fly catcher (*Contopus cooperi*), common nighthawk (*Chordeiles minor*), short-eared owl (*Asio flammeus*), and peregrine falcon (*Falco peregrines anatum*).

One species, the little brown bat (*Myotis lucifugus*), has been classified by COSEWIC as an endangered species, which means they are in immediate danger of extirpation or extinction. Populations of these mammals have been seriously affected by a fungal infection known as White Nose Syndrome. The Minto Mine is within the northern extent of the summer range of the Little Brown Bat, although their existence within the area has not been verified.

Wildlife Species Summaries

The following paragraphs give a brief description of the most recent wildlife surveys that were conducted locally for Minto and surveys conducted by Yukon Government that were larger in scale and included the Minto mine area.

4.1 MOOSE

Current information regarding moose in the area came from two recent aerial surveys conducted by Environment Yukon that covered a large area that included the Minto Mine site. Yukon Government analyses and report write-ups for both years of surveying are still pending. A synopsis of the results is included below:

4.1.1 Aerial Moose Survey – Late Winter 2011/2012

This late winter aerial survey covered 6,400 km² west and northwest of Carmacks. The 2011 map shows a cluster of moose observation points around the Minto Mine and in the southeast highlands, indicating that this area has a high density of moose in the late winter as compared to most of the Regional Survey Area (G. Pelchat, pers. comm.). Minto Mine vicinity has been subjected to numerous fires in the last thirty years and the vegetation cover is dominated by tall shrubs, attractive habitat for moose with plenty of browse and cover.

In addition, the Yukon River is approximately 10 km to the east. This large river corridor has ample shoreline and islands for moose calving and post-calving habitat. The Ingersoll Islands, located in the Yukon River downstream of the project site, are known to be used for calving during the spring and as rearing habitat during the summer (Magrum 1994). The old burn areas in the Minto Creek Valley, the banks of the Yukon River, and the swamp lands below Minto Creek are often used by moose during the spring and summer (EBA 2010a).

4.1.2 Aerial Moose Survey – Winter 2009/2010

Aerial moose surveys were completed on December 15, 2009 (post-rut) and February 23, 2010 (late winter) by ACG (2009 and 2010). The total area surveyed was 112 km², specifically concentrating on the area around the Minto Mine and nearby drainages. Moose density for the post-rut survey was estimated to be 125 moose per 1,000 km² (ACG, 2010). The average population density for calf-to-cow ratio estimated from this data was 25 calves and no sub-adults for every 100 adult cows, and the estimated adult sex ratio was 50 mature bulls for 100 cows, which is considered fair, compared to territorial averages (YG,

4.1.3 2007 Early Winter Moose Survey

The early winter 2007 moose survey for the Carmacks West Moose Management Unit (MMU) was conducted by Yukon Department of Environment. The densities are comparable, as there are similar habitat types in the MMU and its boundaries overlap the Minto Mine. The calculated moose density was 124 moose per 1,000 km² for the survey area.

This survey covered a much larger study area than the surveys conducted by ACG during the winter of 2009/2010, which were specifically focused on the area surrounding the Minto Mine site. However, during this survey in 2007, a total of 208 moose were observed during the survey, with a total population estimate of 520 moose for the study area. Survival rates for calves and yearlings were relatively low. The sex ratio of 75 bulls per 100 cows is considered to be a healthy sex ratio. The average sex ratio for other areas surveyed within Yukon is 68 bulls per 100 cows (O'Donoghue et al. 2008).

4.2 CARIBOU

The closest Woodland caribou herds are the Klaza and the Tatchun. The Klaza herd appears to be the more stable of the two, and is the larger herd. A recent (2012) survey was conducted on the Tatchun herd, by Yukon Government, but the results will not be released until 2013. Below is a brief summary of their relationship with the Minto Mine area.

In 2005, the Klaza herd population was estimated at 650 and predicted to increase (Yukon Environment 2005b). There are concerns for this caribou herd, as an increase in exploration projects and road development may cause negative impacts to the health of the Klaza caribou. The Klaza caribou range is west of the Minto Mine. As the area around the Minto Mine has experienced numerous fires recently, the habitat is of minimal value for caribou (Hegel, pers. comm.). Caribou prefer mature open forests where arboreal and ground lichen are plentiful. A Wildlife Key Area (WKA) for woodland caribou winter range was identified approximately 9 km to the east-northeast of the project area (Yukon Environment 2010b). A recent fall (rut) count of Klaza caribou herd was conducted by Environment Yukon, EDI and Little Salmon/Carmacks members in 2012. The results of this study have yet to be released.

The Tachun Caribou herd range is to the east of the Yukon River and does not overlap with the Minto Mine. In 2005, the population estimate for the Tachun herd was 500 animals. A rutting season composition survey that focused on the Tachun herd range was conducted in 2007, and indicated that the count was much lower than previous years; but this may have been a result of caribou congregating in areas where they were not

detected, such as in the trees (Yukon Environment 2007). A count was conducted in the fall of 2012; results are still under analysis and the report release is pending.

4.3 THIN HORN SHEEP

The Minto Bluffs along the Yukon River have been identified as an important Dall sheep area (O'Donoghue 2009). Although the access road to the Minto Mine passes near sheep habitat, sheep habitat within the project area itself is limited and sheep are not expected to inhabit the project area for any extended length of time.

Between 2000 and 2008, sheep surveys of the Minto-Pelly Bluffs resulted in observations of between 31 and 91 sheep annually; with the majority of observations being ewes, yearlings and lambs. During the 2009 survey, 97 sheep were observed, of which 34 were observed on the Minto Bluffs (which is located about 8 km downstream and across the river from the Minto Mine site). This is the highest recorded population for this area. Most sheep observed during these surveys have been located on the Minto Bluffs, Split Mountain, and Mount Hansen (O'Donoghue 2009).

4.4 CARNIVORES, FUR BEARERS AND SMALL MAMMALS

Fur trapping and big game harvest statistics indicated the following species are expected to occur in the Minto Mine area: grizzly bear, black bear, coyote, gray wolf, red fox, wolverine, marten, least weasel, beaver, and lynx. Cougars may also have the potential to be found in the area as they are known to follow mule deer (Smith et al. 2004). Of the species listed above, the following species (or their sign) have been observed, on site: grizzly bear, black bear, gray wolf, lynx, river otter (HKP 1994, Capstone 2007, 2008). Grizzly bears are known to use the Minto mine area. Sightings and tracks were documented in the 2010 Baseline Ecosystems and Vegetation Report; plus sightings have been reported by mine personnel in the last two years.

The territorial estimates for bear populations in Yukon are 6,000 to 7,000 grizzly bear and 10,000 black bear (Yukon Environment 2010a). Yukon Government has indicated that key habitat for black bears include seasonally concentrated feeding areas, such as south aspect slopes containing sagewort, bearberry, and grassland habitat. Summer and fall feeding habitats typically consist of those areas where berries grow. Black bears have been observed in the project area on many occasions (EBA, 2010b).

Key habitat for grizzly bears includes areas where they concentrate seasonally, such as feeding areas, floodplains, and movement corridors. Important feeding habitat includes areas with profuse berries and areas where salmon spawn (YTG 2010b). Although key habitat for grizzly bears has not been identified on site, they have been seen in the project area regularly since the commencement of mine operations. Observations include a sow with two cubs (ACG, 2010).

Wolverines have large territories where they hunt, scavenge and mate. While there is a moderate probability that they inhabit the area, because of their aversion to human activity and low population, they are not likely to be observed.

Small mammals common to the area include the red squirrel, varying hare, fox, mink, weasel, vole, and shrew. The Minto Mine is situated at the apex of five drainages that are part of the Yukon River watershed, so wildlife will access those valleys that offer conduits from lowlands to highlands for seasonal foraging and hunting (ACG 2010).

4.5 BIRDS

Five species of birds are considered to be of conservation concern: the peregrine falcon, short-eared owl, common nighthawk, olive-sided flycatcher, and rusty blackbird. Three of these species, the peregrine falcon, common nighthawk, and olive-sided flycatcher, have a moderate probability of occurrence at the Minto site. Suitable nesting habitat for the peregrine falcon is located in close proximity to the project site as seen in Figure 2, on the bluffs along the Yukon River (O'Donoghue, pers. comm.), and a historical record of nesting for this species was documented at the Pelly-Yukon River confluence (Mossop, pers. comm. as cited in HKP 1994). Common nighthawks are often found near open lodgepole pine forests, old burn areas and open mixed forests, and near wetlands or rivers (Sinclair et al. 2003) and many of these habitat types occur in the project area. The olive-sided flycatcher often occurs in black and white spruce, lodgepole pine, and mixed forests, from lowland areas to tree-line. The short-eared owl and rusty blackbird are considered to have a low probability of occurrence in the project area. The short-eared owl is often associated with open wetland and meadow, alpine, and alpine tundra habitat, which is limited within the project area. The rusty blackbird is also associated with wetland habitat (Sinclair et al. 2003), which is not abundant within the project area itself, but may occur along the margins of the Yukon River.

The rusty blackbird often nests at the edge of ponds/wetland complexes in boreal forests. They prefer lower elevations, but could feed and nest within the study area. Short-eared owls may travel through the area, but their typical habitat is in and near large meadows and agricultural fields and they may not be seen often because they are nocturnal. Peregrine falcons do not use the habitats in the Minto area; they nest and hunt near steep canyon walls along the Yukon River, approximately 20 km east.

Raptors

Although numerous raptor species have the potential to inhabit the project area, species that have been observed and documented in the Minto Mine area include the red-tailed hawk (HKP 1994), peregrine falcon (Mossop, pers. comm. as cited in HKP 1994), and golden eagle (O'Donoghue, pers. comm.). It should be noted that only one aerial-based raptor survey was conducted as part of the Minto Mine baseline studies (HKP 1994).

High-quality riparian cliff habitat for raptors exists along the Yukon River near the Minto Mine, as seen in the Wildlife Key Area (WKA) map, Figure 2. WKA for golden eagle summer nesting habitat has been identified approximately 3 km to the east of the project area (Yukon Environment 2010b). This WKA is primarily associated with the steep bluffs along the Yukon River and includes a buffer area. No cliff-nesting raptor habitat has been identified within the project area itself. The access road to the Minto Mine, however, runs adjacent to potential nesting areas for cliff-nesting raptors, such as the golden eagle and peregrine falcon.

Waterfowl

Key habitat for waterfowl includes wetlands that are used as staging areas in the spring and fall, and for breeding and molting in the summer. As suitably-sized wetlands are not found near the Minto Mine, waterfowl are not known to be present in large numbers or for extended periods. A key habitat area, Lhatsaw wetlands, lies approximately 30 km east of the project site and is used for nesting and molting in the summer (YG, 2012). Waterfowl that have been seen using the Minto Creek drainage include Canada goose, mallard, northern pintail, green-winged teal, and American widgeon (Capstone, 2010).

Game Species

Other game birds that have been observed or that have the potential to occur in the study area include grouse (spruce, ruffed, and sharp-tailed) and ptarmigan (willow, white-tailed, and rock). Of the species of grouse that live in Yukon, the sharp-tailed grouse is currently the only species of concern that requires management. Sharp-tailed grouse have a limited distribution in the Yukon due to the lack of suitable habitat. Gravel outwashes with fairly stable aspen parkland habitat and wet sedge-hummock meadows after fire are considered suitable habitat for this species. Sharp-tailed grouse have been observed in the project area.

4.6 AMPHIBIANS

Of the five amphibian species known to occur in Yukon and northern British Columbia, only one species is known to occur in the project area: the wood frog (*Rana sylvatica*). This species is restricted to wetland areas and has not been surveyed for in the Minto site. No reptiles are known to occur in Yukon.

5 PROPOSED FUTURE WILDLIFE STUDIES

Collection of Local Wildlife Knowledge

Interviews are expected to be conducted in 2013 by Mark O'Donoghue, North Tutchone Regional Biologist, in the Carmacks and Pelly communities. Through workshops and/or individual conversations with knowledgeable local residents, information will be gathered to identify seasonally important wildlife habitats in the Dawson range. This local knowledge will be entered into the Environment Yukon GIS database. The data can then be used to update and refine WKAs for maps. WKAs are used by wildlife for critical seasonal life functions at periods in the year when animal species are most sensitive to disruption. Knowledge of WKAs and other important sites will provide the basis for recommendations for avoiding impacts or mitigating mining activities in the region.

Wildlife Key Area Inventory Surveys

In addition to inputs from local residents regarding high value habitat, wildlife surveys will be conducted by Environment Yukon to further identify WKAs and document species movement and behavior through the seasons. The information will be entered into Environment Yukon GIS database to help update WKA maps. The maps are used to support environmental assessment reviews and by managers and planners who need current accurate information about wildlife location and important habitats.

In 2012, WKA surveys were focused in areas that are receiving considerable development pressure. These include surveys for sheep and raptors in the Dawson Range.

6 SUMMARY

The frequent and often large fires that have occurred around the Minto Mine have created prime habitat for moose. The numerous moose sightings and sign found in the area indicate that it is attractive and well-used by resident moose. Local aerial surveys completed in early and late winter in 2009 and 2010 respectively, indicates that the population is below territorial average and recruitment may be low. However, the population has increased since the initial local survey was done in 1994. Then, the population was estimated at 40 moose per 1,000 km² during a government-supported count, which is considered below average. Winter surveys in 2007 indicated a population of 125 per 1,000 km² (YG, 2007).

The Klaza woodland caribou herd range is located approximately 10 km west of the Minto Mine, where there is better winter habitat and mature open forests with ample growth of arboreal and ground lichens. The Minto Mine area does not provide good habitat for caribou, but they may travel through occasionally.

Dall sheep habitat is found along the steeper hillsides within the Yukon River corridor; the Minto Mine area does not contain the steep escape topography nor grasslands needed by these animals. The nearest population of Dall sheep is found at the Minto Bluffs approximately 10 km further down the Yukon River. The nearest disturbance is the access road, which is still approximately 10 km from sheep habitat.

Raptor inventories have been concentrated along the Yukon River corridor where steep slopes and cliffs provide nesting and perches for peregrine and golden eagles. Bald eagles commonly use large trees for nesting and are closely associated with riparian systems. Forest-dependent raptors such as northern goshawk and red-tailed hawks are likely nesting around the Minto Mine in mature forest areas.

Black and grizzly bears are known to use the area and may be attracted to food smells emanating from the camp and garbage disposal area. A waste management plan is in place to reduce attracting bears to camp and operation areas.

Large mammals such as moose, mule deer, timber wolves, grizzly bears, and black bears were found to be using riparian corridors, secondary access roads, and exploration transects as migration routes throughout the Minto mine study area (ACG 2010).

Current wildlife population estimates for caribou and moose conducted by Environment Yukon biologists are done over large regional study areas. Average population statistics, especially for moose, may not accurately reflect local habitat usage or seasonal variations, but can serve as a background comparison.

There is a dearth of information on other animals existing in the vicinity of Minto such as wolves, lynx, mule deer and bears. More locally-focused aerial and ground surveys would aid in determining key wildlife areas within the Minto site.

7 REFERENCES

- Access Consulting Group (ACG). 2009. Post Rut Aerial Wildlife Survey. Prepared for Capstone Mining Corporation.
- Access Consulting Group(ACG) . 2010. Late Aerial Wildlife Survey. Prepared for Capstone Mining Corporation.
- Access Consulting Group(ACG) . 2011, Wildlife Protection Plan. Prepared for Minto Explorations Ltd.
- Capstone Mining Corporation. 2007. Wildlife Log for the Minto Mine (spreadsheet).
- Capstone Mining Corporation. 2008. Wildlife Log for the Minto Mine (spreadsheet).
- Capstone Mining Corporation. 2010. Minto, Yukon Project Summary. Available at www.capstonemining.com [accessed March 31, 2010].
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2009. Website accessed November 2012 at: http://www.cosewic.gc.ca/eng/sct1/index_e.cfm
- EBA Engineering Consultants Ltd . 2010a. Minto Mine Environmental Baseline Ecosystems and Vegetation Report. Prepared for Capstone Mining Corporation, March 2010.
- EBA Engineering Consultants Ltd. 2010b. Minto Mine Environmental Baseline Studies-Wildlife Report. Prepared for Capstone Mining Corporation, August 2010.
- Government of Yukon, Community Services(GYWFM) , Protective Services Branch, Wildland Fire Management. 2012. Yukon Fire History GIS Coverage and Metadata.
http://www.geomaticsyukon.ca/Yukon%20Cooperate%20Spatial%20Data%20-%20page%202.html#Land_and_Natural_Resources_-_Fire
- [HKP] Hallam, Knight, Piesold Ltd. 1994. Minto Explorations Limited, Minto Project: Volume II Environmental Settings. Prepared for Minto Explorations Ltd.
- Magrum. 1994. An impact assessment of the Minto Project. Memo from the Selkirk First Nations to the Northern Affairs Program.
- Minto Explorations Ltd. 1994. Initial Environmental Evaluation for the Minto Project.
- O'Donoghue, M., R. Ward, S. Westover, A. Reyner, J. Bellmore. 2008. Carmacks West Moose Management Unit. Summary of Early-Winter 2007 Moose Survey. Yukon Fish and Wildlife Branch, Department of Environment.
- O'Donoghue, M. 2009. Survey of Sheep along the Yukon River from Minto to Fort Selkirk and on Mount Hansen (GMS 3-20).

Oswald, E.T. and B.N. Brown. 1990. Vegetation Establishment during 5 Years Following Wildfire in Northern British Columbia and Southern Yukon Territory. Forestry Canada Pacific and Yukon Region Information Report BC-X-320.

Sinclair, P.H., W.A. Nixon, C.D. Eckert, and N. L. Hughes (editors). 2003. Birds of the Yukon Territory. UBC Press, Vancouver, B.C.

Smith, C.A.S., J.C. Mielke, and C.F. Roots (editors). 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon Landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia.

Yukon Government - Environment. 2005a. Yukon Amphibians. Available at www.environmentyukon.gov.yk.ca/viewing

Yukon Government - Environment. 2005b. Status of Caribou in the Yukon. Department of Environment Map ID ENV.009.

Yukon Government - Environment. 2007. Information for Decisions. 2007 Fish and Wildlife Inventory Program Project Summaries.

Yukon Government - Environment. 2010a. Yukon Mammals. Available at <http://environmentyukon.gov.yk.ca/wildlifebiodiversity/mammals.php> [accessed January 2010].

Yukon Government - Environment. 2010b. Wildlife Key Areas. Produced by the Wildlife Key Area Inventory Program. Environment Yukon, Habitat Programs.

Yukon Government - Environment, 2012, Fish and Wildlife Branch 2012-2013 Project Summaries http://www.env.gov.yk.ca/mapspublications/documents/Fish_Wildlife_Branch_projects_2012-2013.pdf

Personal Communications

Bellmore, Joe. Fish & Wildlife Technician.

Hegel, Troy. Wildlife Specialist: Caribou.

Keesey, Scott. Access Consulting Group Ltd.

O'Donoghue, Mark. N. Tutchone Regional Biologist.

Pelchat, Graeme. Environmental Dynamics Incorporated.

FIGURES

**MINTO MINE
WILDLIFE BASELINE REPORT**

**FIGURE 1
MOOSE SURVEYS
2009-2010**

JUNE 2013

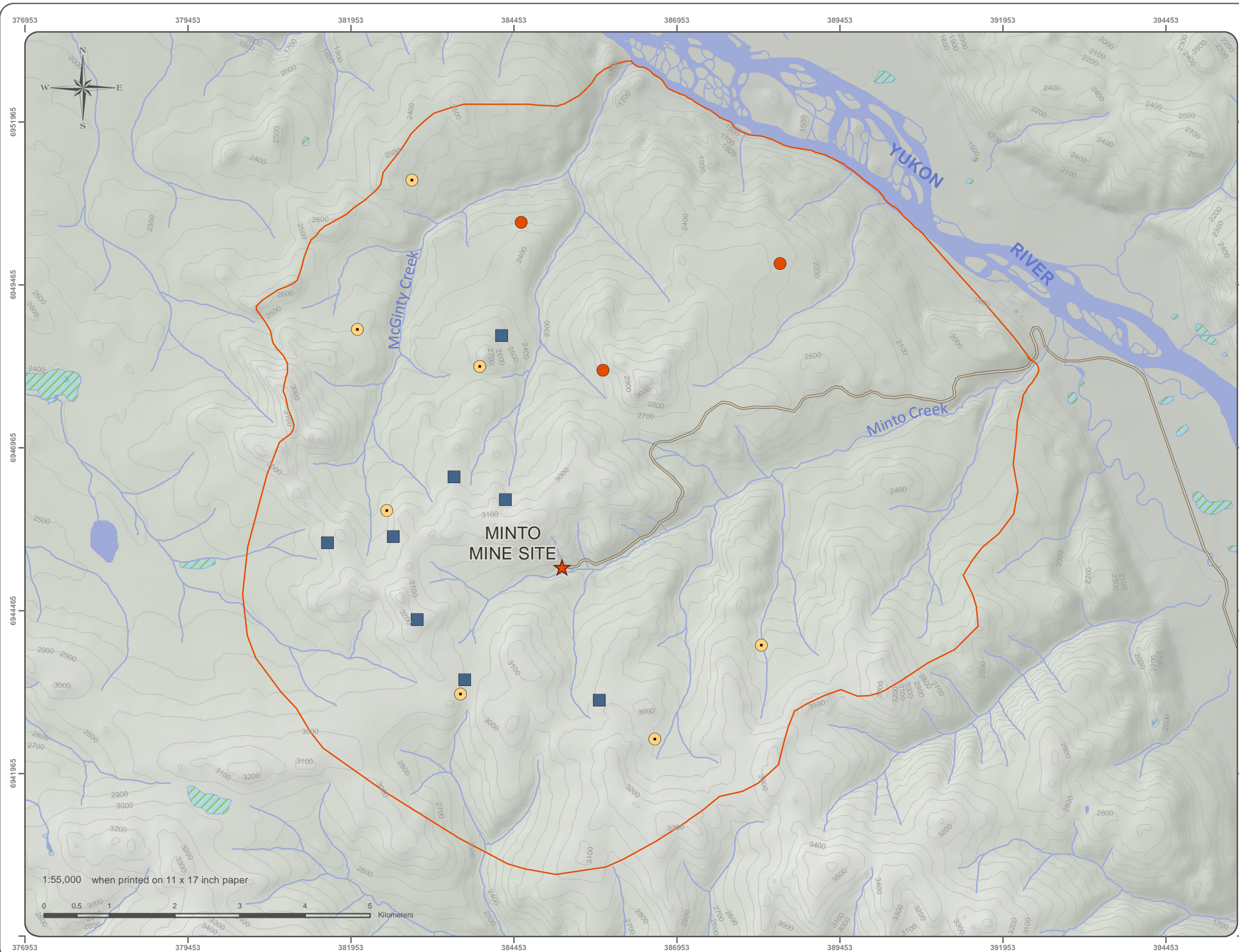


- Moose Observation (15-Dec-2009)
- Moose Observation (23-Feb-2010)
- Moose Tracks Observation (23-Feb-2010)
- Minto Mine Site
- Mine Access Road
- Contours (ft)
- Watercourse
- Waterbody
- Wetland
- Winter 2009/2010 Survey Boundary

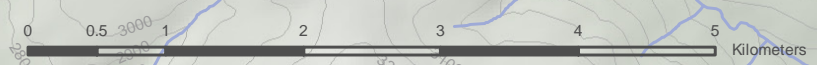
Wildlife Key Area data compiled by the Yukon Department of Environment. Publication Date: May 2009. Obtained from Geomatics Yukon. Canvec compiled by Natural Resources Canada at a scale of 1:10,000 - 1:50,000. Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.

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**MINTO MINE
WILDLIFE BASELINE REPORT**

**FIGURE 2
WILDLIFE KEY AREAS**

JUNE 2013



- Minto Mine Site
- Highway
- Local Road
- Mine Access Road
- Contours
- Waterbody
- Wetland
- Wildlife Key Areas**
- Bald Eagle
- Peregrine Falcon
- Alpine Raptor
- Golden Eagle
- Thinhorn Sheep
- Woodland Caribou

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