

2008  
Wildlife Species  
& Vegetative Assessment

Kennecott Eagle Minerals Company  
Eagle Project Site  
Marquette County, Michigan

Prepared by:



King & MacGregor Environmental, Inc.  
2520 Woodmeadow SE  
Grand Rapids, Michigan 49546  
(616) 957-1231  
[www.king-macgregor.com](http://www.king-macgregor.com)

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## 1.0 INTRODUCTION

King & MacGregor Environmental Inc. (KME) was contracted by Kennecott Eagle Minerals Company to collect biological information within the Eagle Project Site (Study Area) located in northern Marquette County, Michigan (Figure 1-1). KME conducted baseline environmental surveys during 2006, 2007, and 2008 for birds, small mammals, large mammals, and frogs and toads. In addition, vegetative surveys and wetland monitoring were conducted during 2007 and 2008. This report is intended to describe the findings of the baseline surveys conducted during 2008 and should be considered a supplement to the *Wildlife Species Assessment*, dated April 5, 2007 (KME, 2007), which describes the results of the 2006 surveys, and the *2007 Wildlife Species & Vegetative Assessment*, dated March 28, 2008 (KME, 2008), which describes the results of the 2007 surveys.

### 1.1 Study Area

The Study Area is located in Sections 1, 2, 3, 10, 11, and 12, Michigamme Township (T50N, R29W), Marquette County, Michigan (Figure 1-2).

### 1.2 Project Purpose

The purpose of this evaluation is to continue baseline environmental investigation of birds, small mammals, large mammals, frogs and toads, upland vegetation, and wetland vegetation within the Study Area. Sampling points are shown on Figure 1-3.

## 2.0 BIRDS

### 2.1. Methods

The methodologies used and described in the *Wildlife Species Assessment* and the *2007 Wildlife Species & Vegetative Assessment* were employed during the 2008 bird survey. A breeding bird survey was conducted on June 9 and 10, 2008 at 31 sampling points. A fall bird migration study was conducted September 22 and 23, 2008 at 21 sampling points (Figure 1-3). The same sampling points were used during the 2006, 2007, and 2008 bird surveys. All points were surveyed on two separate days for both the breeding bird and fall migration surveys. Wildlife species observed within the study area outside of the established survey points during the course of the biological surveys were recorded as "incidental wildlife species."

### 2.2 Results

During the June breeding bird survey, 561 birds representing 32 species were observed (Tables 2-1 and 2-2). During the September migration survey, 196 birds representing 21 species were observed (Tables 2-3 and 2-4). A total of 757 birds representing 38 species were identified during the June and September 2008 bird surveys (Table 2-5). In addition, 97 birds representing 26 species were recorded in the course of the 2008 field investigations as incidental wildlife species (Table 2-5).

Two bald eagles (*Haliaeetus leucocephalus*) and a merlin (*Falco columbarius*), both state-threatened bird species, were observed during the 2008 sampling period and recorded as incidental wildlife species (Table 2-5). The federally and state-endangered Kirtland's warbler (*Dendroica kirtlandii*) was not detected at any time during the surveys.

### 2.3 Discussion

The bird species identified during the 2008 bird surveys are similar to those bird species identified in previous surveys conducted within the Study Area and are consistent with the bird species one would expect in the habitats present.



## **3.0 MAMMALS**

### **3.1 Small Mammals**

#### **3.1.1 Methods**

The methodologies used and described in the *Wildlife Species Assessment* and the *2007 Wildlife Species & Vegetative Assessment* were employed during the 2008 small mammal surveys. Sampling was conducted on May 13, 14, and 15, 2008. The same 12 sampling points established during the 2006 small mammal surveys were used during the 2008 sampling events (Figure 1-3). Each sampling point was surveyed on three separate days, for a total of 36 sampling events. Wildlife species observed within the Study Area outside of the established survey points during the course of the biological surveys were recorded as “incidental wildlife species.”

#### **3.1.2 Results**

Sixteen small mammals representing four species were identified during the May 13, 14, and 15, 2008 survey period (Table 3-1a, 3-1b, and 3-1c). These four species included deer mouse (*Peromyscus maniculatus*), Eastern chipmunk (*Tamias striatus*), boreal redback vole (*Clethrionomys gapperi*) and Northern flying squirrel (*Glaucomys sabrinus*). The most common small mammal identified in the surveys was the Eastern chipmunk. A snowshoe hare (*Lepus americanus*) was recorded on May 13, 2008 as an incidental wildlife observation (Table 3-2). No threatened or endangered small mammals were observed.

#### **3.1.3 Discussion**

The small mammals encountered within the Study Area during the 2008 surveys are typical of those expected in the habitats present and are consistent with previous survey results. Small mammals were distributed throughout wooded and open areas in upland and wetland habitats.

### **3.2 Large Mammals**

#### **3.2.1 Methods**

The methodologies described in the *Wildlife Species Assessment* and the *2007 Wildlife Species & Vegetative Assessment* were employed during the 2008 large mammal surveys. Although methodology did not include surveys specifically for large mammals, all evidence of large mammal presence observed in the course of conducting field work for other wildlife or vegetation within the Study Area was documented as incidental wildlife (Table 3-2). Wildlife species observed within the Study Area outside of the established survey points during the course of the biological surveys were recorded as “incidental wildlife species.”

#### **3.2.2 Results**

The American black bear (*Ursus americanus*) and the whitetail deer (*Odocoileus virginianus*) were the two large mammal species directly observed during the 2008 surveys. Indirect evidence (scat or tracks) of moose (*Alces alces*) and coyote (*Canis latrans*) was observed in various locations within the Study Area (Table 3-2).

#### **3.2.3 Discussion**

All of the large mammal species detected during the 2008 surveys are species that would be expected in the habitats present. Other relatively common species possibly present or previously observed within the Study Area but not noted during our 2008 surveys include red fox (*Vulpes vulpes*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), bobcat (*Lynx rufus*), and river otter (*Lutra*



*canadensis*). Indirect evidence of gray wolves (*Canis lupus*), which included tracks and scat, was observed during the 2006 and 2007 surveys but not in 2008.

## **4.0 FROGS AND TOADS**

### **4.1 Methods**

The methodologies used and described in the *Wildlife Species Assessment* and the *2007 Wildlife Species & Vegetative Assessment* were employed during the 2008 frog and toad surveys. KME used the same three frog and toad sampling points previously established in 2006 (Figure 1-3). Surveys were conducted after sunset on May 13 and 15, 2008. Wildlife species observed within the Study Area outside of the survey points during the course of the biological surveys were recorded as “incidental wildlife species.”

### **4.2 Results**

Three frog species and one species of toad were heard during the surveys (Table 4-1a and 4-1b). These species included the Northern spring peeper (*Pseudacris crucifer*), the Northern leopard frog (*Rana pipiens*), the wood frog (*Rana sylvatica*) and the American toad (*Bufo americanus*). Frog and toad calling activity included Call Index Values of 1, 2, and 3. No threatened or endangered frog or toad species were identified during the surveys.

### **4.3 Discussion**

All three of the sampling points exhibited use by frogs for breeding. The most frequently recorded species was the Northern spring peeper. The frog and toad species identified are typical of those expected in the habitats present in the Study Area.

## **5.0 THREATENED AND ENDANGERED SPECIES**

### **5.1 Methods**

The Michigan Natural Features Inventory (MNFI) maintains a database of rare plants and animals in Michigan. Prior to the 2008 surveys, KME conducted a search of the MNFI database to determine if any protected species had been found in or near the Study Area since our last review of the database in 2007.

In accordance with Michigan Department of Natural Resources (MDNR) guidelines (MDNR, 2001), KME surveyed for any MNFI listed species or their habitats during the appropriate season. KME also noted other protected species that were observed during field investigations but not previously identified by MNFI.

Wildlife species observed within the Study Area during the course of the biological surveys were recorded as “incidental wildlife species.”

### **5.2 Results**

The MNFI database query on August 6, 2008 indicated that the narrow-leaved gentian (*Gentiana linearis*), a state-threatened plant species, had been added to the database since 2007. KME was aware that the narrow-leaved gentian had been identified near the Study Area, in the floodplain of the Yellow Dog River, but did not observe this plant during any of the surveys within the Study Area. The MNFI database query covering the Study Area resulted in no other additional plant or animal species.

Two state-threatened bird species, the bald eagle and the merlin, were observed during the 2008 sampling period and recorded as incidental wildlife species (Table 3-2). On May 13, 2008, one adult merlin was seen flying and heard calling over the plains near Sample



Point 15. One adult bald eagle was seen flying overhead from Sample Point 21 on June 9, 2008. No nesting sites for these state-threatened species were observed.

Although evidence of gray wolf activity was observed during 2006 and 2007, no observations were made during the 2008 field study.

### **5.3 Discussion**

The state threatened merlin is a small falcon, about the same size as an American kestrel. Most of its small population is found in the Upper Peninsula, usually in coniferous forests near lakeshores or inland lakes (McPeck, 1994).

In Michigan, the bald eagle is most often found in the northern Lower Peninsula and the Upper Peninsula. Since this raptor's primary food source is fish, it nests near open water. Although its population in Michigan has increased significantly since the 1980's, the bald eagle retains its state threatened status (McPeck, 1994).

After having been removed from protection under the federal Endangered Species Act in 2007, gray wolves in the western Great Lakes region were relisted on September 29, 2008. Possible evidence of gray wolves was observed in the Study Area during the 2006 and 2007 surveys, but not in 2008. Evidence included large canine tracks and scat.

Brian Roell, Wolf Program Coordinator for the Michigan Department of Natural Resources (MDNR) was contacted on December 16, 2008 to discuss the known extent of the gray wolf population within the area of study. This contact was made via telephone by James Hammill, President, Iron Range Consulting & Services, Inc. The MDNR routinely collects and records locations of wolf den and rendezvous sites and has been collecting that data since 1990. Roell stated that the study area is not now nor has it been used by wolves for den or rendezvous activities. The nearest known rendezvous site is approximately 5 ½ miles west-northwest of the study area, last known to be used in 2007 (Hammill, personal communication, December 17, 2008. Appendix).

## **6.0 WETLAND MONITORING**

### **6.1 Methods**

An assessment of 10 wetland areas (Figure 1-3) was conducted on July 22 and 23 and October 14, 2008. Sampling points were established within each wetland. Wetland sampling points are referenced as 1W, 6W through 13W, and 26W. The stakes marking each sampling point were maintained during the 2008 surveys. At each sampling point, the percent cover of each live plant species and bare soil or duff in the herbaceous stratum (plants less than 3.2 feet tall) was estimated in fixed-frame, square meter plots. The number of live stems of plants in the combined shrub/sapling and over story stratum (plants greater than 3.2 feet tall) was determined in 30-foot radius circular plots. The 30-foot radius plots were established using a flexible tape and their perimeters were marked with plastic coated wire stakes. Photographs were taken of each sampling point (Wetland Sampling Point Photographs 1 through 20).

Soils were not evaluated in 2008 because it is not likely that they would have changed noticeably since last year.

To determine the degree to which the vegetation identified at each sampling point consisted of wetland species, the wetland indicator codes developed by the U.S. Fish and Wildlife



Service (USFWS) and elaborated in the *Floristic Quality Assessment with Wetland Categories and Examples of Computer Applications for the State of Michigan* (MDNR, 2001) (FQA), were used. These codes are OBL (obligate wetland species), FACW (facultative wetland species), FAC (facultative species), FACU (facultative upland species), and UPL (upland species). OBL species occur in wetlands >99% of the time; FACW species occur in wetlands >66% of the time; FAC species occur in wetlands 50% of the time; FACU species occur in wetlands <33% of the time; UPL species occur in wetlands <1% of the time. The plus and minus signs that accompany some of the codes indicate a greater (+) or lesser (-) affinity for wetlands. To quantitatively determine the degree to which the vegetation was dominated by wetland species, each wetland indicator code was assigned a value: UPL = 5, FACU- = 4, FACU = 3, FACU+ = 2, FAC- = 1, FAC = 0, FAC+ = -1, FACW- = -2, FACW = -3, FACW+ = -4, OBL = -5. The average of these numbers serves as an index for evaluating the “wetness” of the vegetation at a site. When the average is greater than zero, the vegetation consists predominantly of non-wetland species (ranging from FAC- to UPL), whereas a negative average indicates a prevalence of wetland species (ranging from FAC+ to OBL).

An average coefficient of conservatism was determined for each sampling point. Coefficients of conservatism are values ranging from 0 to 10 that have been assigned to each plant species by the MDNR in their FQA. These values represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to have been a pre-settlement condition.

Wildlife species observed within the Study Area during the course of the biological surveys were recorded as “incidental wildlife species.”

## 6.2 Results

The wetland sampling point data is presented in Table 6-1a. Table 6-1b summarizes the data collected for the square meter plots. Table 6-1c summarizes the collected data for the 30-foot radius plots. Table 6-1d summarizes the combined collected data (including averages of wetland indicator code and coefficient of conservatism) for each plot. Table 6-2 is an overall species list of the plants found at the wetland sampling points.

A total of 67 different plant species was observed during the 2008 wetland surveys (Table 6-2). Overall, the plots contain an average of 92 percent native species (Table 6-1d). The actual percentage of native species may be slightly higher given that plants not identifiable to the species level were not counted as native species unless it was determined that non-native species from the genera in question were unlikely to be present. Wetland indicator values in the herbaceous stratum range from FACU to OBL (Table 6-1b). In the shrub/sapling and overstory stratum, the values range from FACU to FACW+ (Table 6-1c). The average wetland indicator code values for each sampling point range from FACU+ to FACW+ (Table 6-1d). No state or federally protected plant species were identified.

## 6.3 Discussion

The data provides qualitative and quantitative baselines against which to measure future monitoring results and determine if significant changes are occurring. The wetland indicator code values generally indicate a wetter flora in the herbaceous stratum. The coefficients of conservatism for the plots generally indicate a flora with fairly low fidelity to specific natural communities. One notable exception to this is Sampling Point 26W, which is a bog.



## 7.0 FLORA MONITORING

### 7.1 Methods

Spring monitoring of flora was conducted on June 9 and 10, 2008 and late summer monitoring was conducted on September 10 and 11 and October 14, 2008 at 21 sampling points along the seven transects. Sampling points are identified as 1-3, 10-15, and 20-31 (Figure 1-3). The percent cover of each live plant species and bare soil or duff in the herbaceous stratum (plants less than 3.2 feet tall) was estimated in fixed frame square meter plots. The number of live stems of plants in the combined shrub/sapling and over story stratum (plants greater than 3.2 feet tall) was determined in 30-foot radius circular plots. The 30-foot radius plots were established using a flexible tape.

To determine the degree to which the vegetation consisted of wetland species, the wetland indicator codes developed by the USFWS and elaborated in the FQA, were used. These codes are OBL (obligate wetland species), FACW (facultative wetland species), FAC (facultative species), FACU (facultative upland species), and UPL (upland species). OBL species occur in wetlands >99% of the time; FACW species occur in wetlands >66% of the time; FAC species occur in wetlands 50% of the time; FACU species occur in wetlands <33% of the time; UPL species occur in wetlands <1% of the time. The plus and minus signs that accompany some of the codes indicate a greater (+) or lesser (-) affinity for wetlands. To quantitatively determine the degree to which the vegetation was dominated by wetland species, each wetland indicator code was assigned a value: UPL = 5, FACU- = 4, FACU = 3, FACU+ = 2, FAC- = 1, FAC = 0, FAC+ = -1, FACW- = -2, FACW = -3, FACW+ = -4, OBL = -5. The average of these numbers serves as an index for evaluating the “wetness” of the vegetation at a site. When the average is greater than zero, the vegetation consists predominantly of non-wetland species (ranging from FAC- to UPL, whereas a negative average indicates a prevalence of wetland species (ranging from FAC+ to OBL).

An average coefficient of conservatism was determined for the plants identified in each sampling period. Coefficients of conservatism are values ranging from 0 to 10 that are assigned to each plant species by the MDNR in their FQA. These values represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition.

The stakes marking each sampling point were maintained during the 2008 surveys. The perimeters of the 30-foot radius plots were marked with plastic coated wire stakes. Photographs were taken of each sampling point (Vegetative Sampling Point Photographs 1 through 42).

Wildlife species observed within the Study Area during the course of the biological surveys were recorded as “incidental wildlife species.”

### 7.2 Results

Plot-specific lists were compiled (Table 7-1a and 7-1b). Overall plant lists for each sampling period were also prepared (Table 7-2a and 7-2b). These lists include the wetland indicator code and coefficient of conservatism of each species.

A total of 45 different plant species was identified during the June, 2008 surveys (Table 7-2a), while 43 different species were identified in the September, 2008 surveys (Table 7-2b). Some unidentified mosses and lichens were observed during each sampling period.



In both the June and September surveys, the most frequently observed plants in the square meter plots were bracken fern (*Pteridium aquilinum*), blueberry (*Vaccinium angustifolium*), and moss (unidentified species). Bare soil/duff was also frequently noted in both June and September.

Expressed as percent cover of the total area of the 21 plots, in both the June and September surveys the square meter plots were dominated by blueberry, sphagnum moss (*Sphagnum* spp.), unidentified moss, and bare soil/duff. In September, bracken fern was also a dominant plant. Because the foliage of different species can overlap, the total percent cover in some plots exceeds 100 percent.

In the 30-foot radius circular plots, 19 species were identified in the June surveys and the September surveys. The most frequently encountered species in June and September were red maple (*Acer rubrum*), jack pine (*Pinus banksiana*), and black spruce (*Picea mariana*). Total stems varied somewhat from June to September with red maple ranging from 326 to 310, jack pine from 236 to 217, and black spruce from 298 to 299.

Plants not identifiable to the species level were counted as native species only if it was determined that non-native species from the genera in question were unlikely to be present. Wetland indicator codes ranged from OBL to UPL, with an overall average of FAC for each season. The coefficients of conservatism ranged from 1 to 10, with an overall average of 4.5 in June and 4.3 in September (Table 7-2a and 7-2b). No state or federally protected plant species were identified.

### **7.3 Discussion**

The data provides qualitative and quantitative baselines against which to measure future monitoring results and determine if significant changes are occurring. The minor difference between the two seasonal overall plant lists is likely due to seasonal plant emergence and investigator interpretation. The variation in the total number of stems in the 30-foot radius plots is likely contributable to seasonal plant emergence, investigator interpretation and mortality / recruitment. The wide range of wetland indicator codes indicates some variability of microclimatic conditions. The relatively high overall coefficient of conservatism average reflects the lack of non-native species.

### **8.0 CONCLUSION**

The wildlife and plant species identified by the 2008 surveys within the Study Area are similar to those identified during the 2006 and 2007 surveys. Thirty-eight species of birds were observed during the bird surveys. Two state threatened bird species, the bald eagle and the merlin, were recorded as incidental wildlife species. Four small mammal species, none of which are threatened or endangered, were identified. Large mammals of two species were directly observed and indirect evidence of two other large mammal species was also documented. None of the large mammal species recorded in 2008 are threatened or endangered. Possible evidence of gray wolves was observed during the surveys in 2006 and 2007, but not in 2008. Three frog species and one species of toad, none of them threatened or endangered, were identified. Vegetative sampling plots in both upland and wetland communities identified plant species common to this region. No threatened or endangered plant species were encountered during the surveys. All of the wildlife and plant species identified within the Study Area are typical of those species associated with the vegetative communities of the region.



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## FIGURES



## TABLES



**WETLAND POINT  
PHOTOGRAPHS**



**VEGETATIVE SAMPLING  
POINT PHOTOGRAPHS**



## APPENDIX

