

Golden Eagles (*Aquila chrysaetos*) Breeding in Wapusk National Park, Manitoba

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The North American subspecies of the Golden Eagle (*Aquila chrysaetos*) is of conservation concern throughout Canada. The species is not currently known to breed in Manitoba. In 2011 and 2012, during the course of surveys in Wapusk National Park of Canada in northeastern Manitoba, seven pairs of Golden Eagles and one sub-adult were observed. The identification of nests in proximity to three pairs, the presence of an adult at one nest, and visible white down feathers on two nests confirm breeding and extend the breeding range of the Golden Eagle into Manitoba, where breeding was previously uncertain. The three occupied nests were 14 km ($n = 2$) and 31 km ($n = 1$) from the nearest adjacent occupied nest identified. Foraging on Canada Goose (*Branta canadensis*) goslings was observed. Further research is needed to determine the overall nest density and the diet of Golden Eagles in northeastern Manitoba.

Key Words: Golden Eagle; *Aquila chrysaetos*; Wapusk National Park of Canada; nests; range; breeding; Manitoba

The North American Golden Eagle (*Aquila chrysaetos canadensis*) is a far-ranging migratory bird. Its conservation depends on the protection of habitat in Canada and in the United States. Breeding for the larger western populations is reported from Alaska south to central Mexico, with scattered breeding extending east to the border of Saskatchewan and Manitoba (Figure 1A) (Kochert et al. 2002). The smaller eastern population is estimated at only 1000–2500 individuals and currently breeds mainly in Quebec, but some breeding is reported in Ontario and in Labrador in Newfoundland and Labrador (Figure 1A) (Sutherland 2007; Katzner et al. 2012). Management of these eastern Golden Eagles requires a better understanding of their distribution, habitat requirements, and abundance (Katzner et al. 2012).

Overall, Golden Eagles are rare in Manitoba and are mainly observed during spring and fall migration and in winter in the southwestern portion of the province (Manitoba Avian Research Committee 2003). Two historical nesting records from Manitoba, along the Cochrane River north of Brochet and at Hell's Gate Gorge (Figure 1A), are cited repeatedly in birding reference books (e.g., Godfrey 1966; Godfrey 1986; Manitoba Avian Research Committee 2003), but there is a lack of contemporary evidence of nesting in the province. Golden Eagle breeding status in the province as a whole is uncertain (Manitoba Avian Research Committee 2003). This species is uncommon but increasing in the area around Churchill, Manitoba, but without confirmed breeding (Chartier 1994; Jehl 2004).

In 2011, the Manitoba Breeding Bird Atlas, as part of its work across the province, embarked on a five-year

collaborative field effort with the Parks Canada Agency to conduct breeding bird surveys in Wapusk National Park of Canada on the western shore of Hudson Bay. Through this work, we documented breeding evidence of Golden Eagles along the Owl River and the Broad River.

Methods

Study area

The study area is in northeastern Manitoba, in and around Wapusk National Park (N58°, W93.5°) (Figure 1B). Characterized by extensive fens and bogs, Wapusk National Park extends from the northern boreal forest in the southwest to the tundra in the northeast. The area is devoid of cliffs, and the land slopes gently from sea level along the shore of Hudson Bay to less than 100 m above sea level in the southwestern area of the park (Dredge and Nixon 1992). Large trees—White Spruce (*Picea glauca*), Black Spruce (*Picea mariana*), and Tamarack (*Larix laricina*) (Brook 2001)—are mainly found along the banks of the rivers and creeks and in narrow bands around lakes.

Field methods

Avian researchers surveyed portions of Wapusk National Park in June 2011 and 2012 (Figure 1B). Due to the remoteness of the park, survey routes were planned to include canoeing on rivers and cross-country hiking. The area along the Owl River was surveyed in 2011 from the railway tracks (which run from Churchill south to Bird, Manitoba, parallel to the western boundary of the park) east to the shore of Hudson Bay. In 2012, surveys were conducted from the M'Clintock station stop

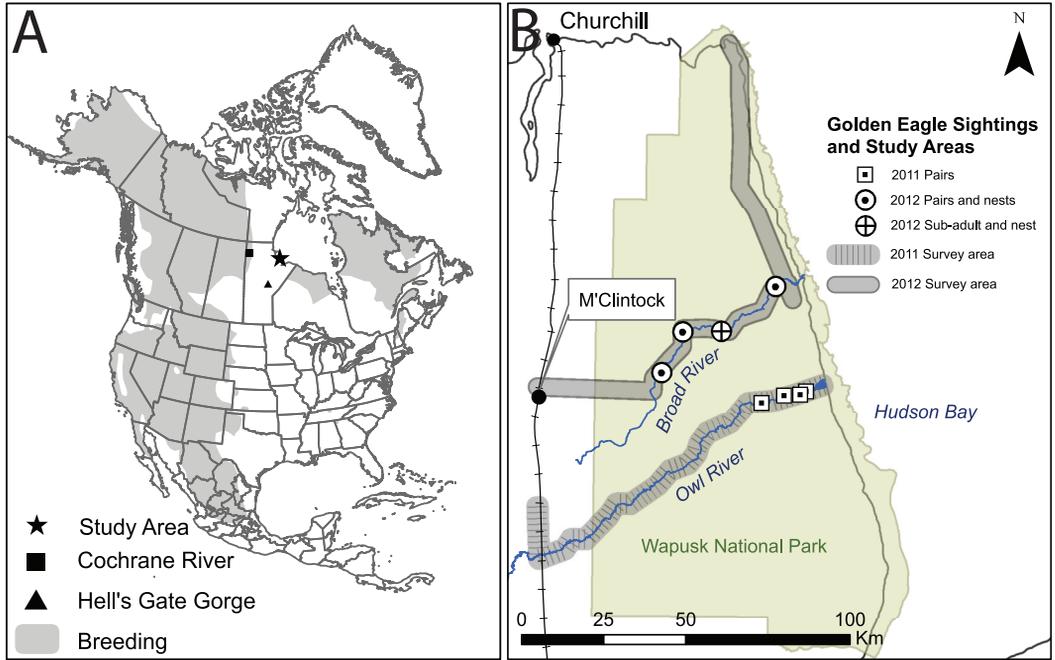


FIGURE 1. North American Golden Eagle (*Aquila chrysaetos canadensis*) breeding range (created using map data from Kochert et al. (2002) and Katzner et al. (2012)) and approximate locations of two historical nesting records in Manitoba (Cochrane River and Hell's Gate Gorge) from Godfrey (1986) (A). Locations of the Golden Eagles, nests, and Manitoba Breeding Bird Atlas areas for June 2011 and June 2012 in Wapusk National Park, Manitoba (B).

to the Broad River, along the Broad River to Hudson Bay, and north along the shoreline to Cape Churchill.

From 15 to 25 June 2011 and from 5 to 12 June 2012, the research team worked on and along the Owl River and the Broad River, respectively (Figure 1B). In the mornings, avian point counts (methods described in Manitoba Breeding Bird Atlas 2011*) were completed on foot. The survey team canoed to the next camp in the afternoon. Sightings of birds of interest, namely rare species (e.g., Golden Eagles) or species listed under the federal Species at Risk Act, were recorded consistently throughout the field work. Upon confirmation of a Golden Eagle sighting, the research team attempted to locate a nest nearby.

The locations of the point counts, sightings of Golden Eagles, and nest sightings were geo-referenced in the field with a Geographical Positioning System (GPS) unit and subsequently mapped in ArcGIS 10.0. The distances between adjacent occupied nests were measured in ArcGIS 10.0.

Results and Discussion

Four pairs of Golden Eagles were sighted on the Owl River in 2011 (Figure 1B). Each pair undertook behaviour suggestive of breeding upon approach by canoe. Specifically, the Golden Eagles moved farther off and

circled as a pair. We were unable to locate nests, and these sightings were thus deemed to indicate probable breeding (as per Manitoba Breeding Bird Atlas 2011*).

In 2012, three pairs of Golden Eagles and one sub-adult (3–5 years old) Golden Eagle were sighted along the Broad River (Figure 1B). We found a stick nest near each of the three pairs sighted (Figures 2A, 2B, and 2D), and a partially constructed eyrie was located near the sighting of the sub-adult (Figure 2C). An adult Golden Eagle flew off one of the nests (Figure 2B) as we approached by canoe.

The three nests associated with mature pairs were constructed of sticks of the right size and shape for Golden Eagles and had the overall appearance of Golden Eagle nests (as opposed to Bald Eagle (*Haliaeetus leucocephalus*) nests) (Todd Katzner, personal communication, 18 January 2013). The presence of white down feathers on two of the nests (Figure 2A and 2D) is indicative of breeding in the current year, and the presence of adult Golden Eagle feathers further differentiates these nests from Bald Eagle nests (Todd Katzner, personal communication, 18 January 2013). The collective weight of this evidence leads us to the conclusion that Golden Eagles are breeding in Wapusk National Park, northeastern Manitoba (as per Manitoba Breeding Bird Atlas 2011*).

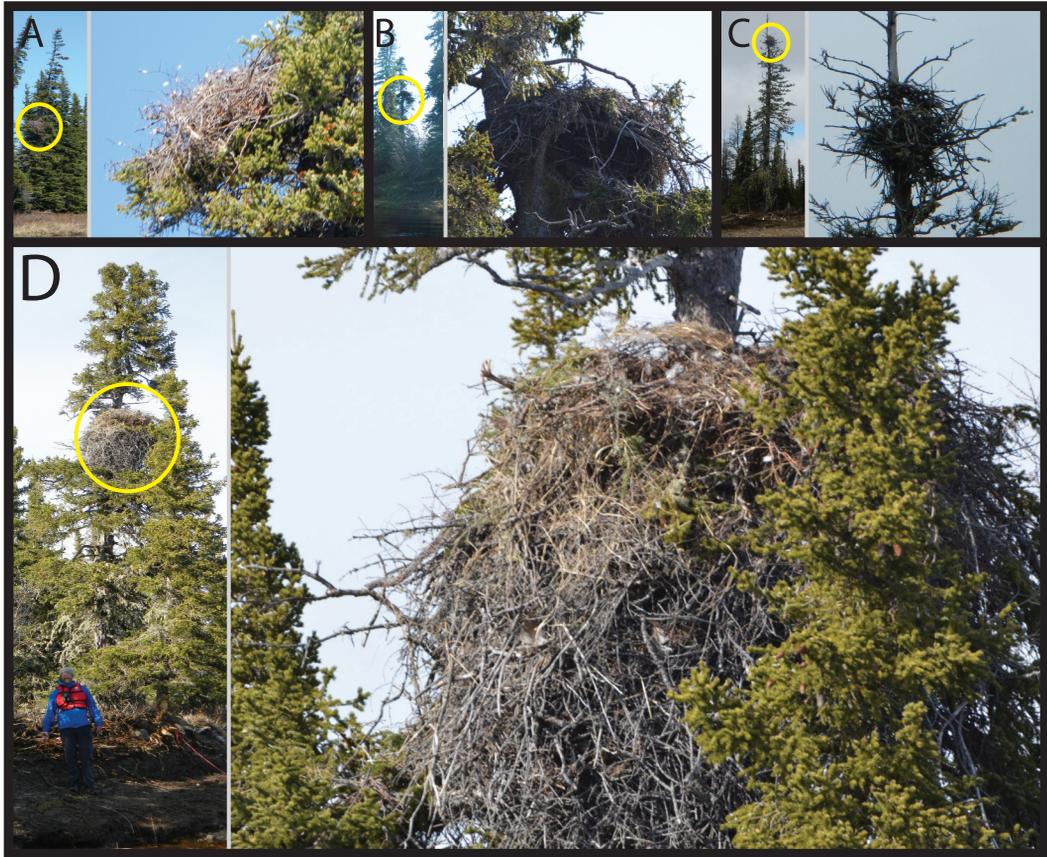


FIGURE 2. Three active North American Golden Eagle (*Aquila chrysaetos canadensis*) nests (A, B and D) and one partially constructed eyrie (C) found in Wapusk National Park, Manitoba, 2012.

For the three nests associated with pairs, the distances to the nearest adjacent nest identified were 14 km ($n = 2$) and 31 km ($n = 1$) (Figure 1B). Based on an extensive inventory of Golden Eagle nesting areas along Hudson Bay in northern Quebec, Morneau et al. (1994) reported similar distances to adjacent nests (range 9.8–44.7 km, $\bar{x} = 26.5$, $SD = 11.0$, $N = 16$). No other nests were identified during our work. A systematic survey is needed to determine the overall Golden Eagle nest density.

All four nests were in White Spruce trees along the north bank of the Broad River and approximately 5 to 10 m above the ground (Figure 2). The three nests associated with breeding pairs were in the top half to top third of the trees, with generally southern exposures. The third active nest was the largest (estimated >1 m in depth). This nest contained at least two ages of sticks, and two platforms were visible (Figure 2D). As Golden Eagles re-use nests and add to their nests over the years (Kochert et al. 2002), we estimate the third active nest had been used for multiple years. Due to the number of mature Golden Eagles observed over the two

years of the survey (seven pairs) and the size of the third active nest described above, we hypothesize that these sightings do not imply a recent change in distribution of the species but rather are likely the result of increased search effort in a remote region.

Katzner et al. (2012) describe the breeding habitat of the eastern population of the Golden Eagles in northern Quebec, Ontario, and Labrador (Newfoundland and Labrador) as the “interface of tundra, boreal forest and wet meadows” (page 170), an apt description of the study region in Wapusk National Park. The nearest probable and confirmed breeding evidence from the second Ontario Breeding Bird Atlas was approximately 320 km and 550 km, respectively, southeast of our study area, with most nests on bedrock cliffs and less commonly in tall riverside spruce at the tundra–boreal ecotone (Sutherland 2007). Satellite tracking or genetic analysis may be useful in identifying the migration routes and wintering grounds of the Golden Eagles we observed in Wapusk National Park and in determining whether they are more closely related to birds from the west (i.e., Saskatchewan) or from the east (i.e., Ontario).

The partially constructed eyrie differed from the three nests associated with breeding pairs in that it was smaller and in poorer condition (i.e., the branches were not tightly packed and there was a hole in the bottom of the nest) (Figure 2C). In contrast to the other three nests, it was constructed near the top of the tree, in branches that likely could not support an active nest. We hypothesize this nest may have been built by the sub-adult eagle to establish a nesting territory for future years, as has been suggested for a sub-adult Bald Eagle in British Columbia (Forbes and Kaiser 1984). As Golden Eagles build alternate nests in their breeding territories (McGahan 1968; Fasce et al. 2011; Kochert and Steenhof 2012), other possibilities are that this nest was built by a mature breeding pair or that it was a partially collapsed nest, now abandoned, that proved attractive to a sub-adult bird. This nest may also have been built by another species, possibly Bald Eagles.

Throughout their range in North America, Golden Eagles generally nest on cliffs (Kochert et al. 2002), including near Hudson Bay in northern Quebec (Morneau et al. 1994) and along the Churchill River in Saskatchewan (Whitfield et al. 1969). Nesting in trees is rarer, but it has been documented in Ontario (Lumsden 1964; Sutherland 2007), Montana (McGahan 1968), and in the Gaspésie in Quebec (Brodeur and Morneau 1999*). Nests on the ground are used in some areas (Menkens and Anderson 1987), but tree sites provide better protection from predators.

As nests can weigh hundreds of kilograms (Watson 2010), tree nesting is limited by the availability of trees that can support this weight. A variety of tree species are used in North America, including deciduous trees (Menkens and Anderson 1987), Eastern White Pine (*Pinus strobus*) (Brodeur and Morneau 1999*), and Ponderosa Pine (*Pinus ponderosa*) (Menkens and Anderson 1987). Our observations of nests in White Spruce can likely be attributed to these being the largest trees in a region lacking suitable cliff sites.

The four pairs of Golden Eagles observed along the Owl River in 2011 were first observed flying low above the river where recently hatched Canada Goose (*Branta canadensis*) goslings were swimming. We observed one gosling falling prey to a Golden Eagle, and we hypothesize young geese are likely an important food source. Along the arctic coast in the central Northwest Territories, Poole and Bromley (1988) determined Arctic Hare (*Lepus arcticus*) was the main prey item for Golden Eagles but waterfowl, mainly Canada Geese and eiders (*Somateria* spp.), accounted for 40% of the diet.

Birds are the main prey of Golden Eagles breeding near Hudson Bay in northern Quebec (Brodeur and Morneau 1999*). Arctic Hares (Dubois and Monson 2004), Canada Geese, and eiders (Rockwell et al. 2009) are found in Wapusk National Park, and we hypothesize that these may form part of the Golden Eagle's diet in the region. There are also large nesting colonies of Lesser Snow Geese (*Chen caerulescens caerulescens*)

in Wapusk National Park (Rockwell et al. 2009). Further research is needed to determine the diet of the Golden Eagle in the region.

Our identification of tree-nesting Golden Eagles in Wapusk National Park, northeastern Manitoba, extends the known breeding range of this species. Further research is needed, through a dedicated survey, to determine the extent of the nesting areas and the number of birds nesting and to characterize nest sites and nesting habitat in Manitoba. On a larger scale, further research is needed to determine the migration routes and wintering grounds of these Golden Eagles and thus support international conservation efforts.

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