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Night-calling Bird Survey 2002-2004
Grand Portage National Monument

Natural Resource Technical Report NPS/GLKN/NRTR—2008/134

ON THE COVER

Barred Owl, American Bittern, and American Woodcock by Mimi Hoppe Wolf, from *The Visitor's Guide to the Birds of the Central National Parks* by Roland H. Wairer, John Muir Publications, Santa Fe, NM, 1994.

Night-calling Bird Survey 2002-2004
Grand Portage National Monument

Natural Resource Technical Report NPS/GLKN/NRTR—2008/134

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Abstract

The initial bird inventory for Grand Portage National Monument was derived from limited field sampling in 1992-1994 and breeding bird surveys begun in 1997. As a result, species not present during the spring breeding season or which do not normally call during early morning hours had not been adequately sampled within the Monument. This project addressed one portion of this information gap by funding night-calling bird surveys from 2002 through spring 2004. Standardized methods were used to assess the presence and relative abundance of owl species, and limited informal sampling was used to detect the presence of other night-calling species in suitable habitats. The presence of three owl species (Great Horned, Barred, and Northern Saw-whet owls) in or near Monument property during the early spring nesting season were verified. Observations also suggest that two additional species (Great Gray and Boreal owls) may be present in the vicinity, at least in some years. Other night-calling species documented by this study include Ruffed Grouse, American Woodcock, Wilson's Snipe, Common Nighthawk, and Sora.

Acknowledgements

This survey of night-calling bird species at Grand Portage National Monument was funded by the National Park Service Great Lakes Inventory and Monitoring Network based in Ashland, Wisconsin, and supported by the Grand Portage National Monument Resource Management Division. Excellent training and field assistance was received from David Benson, private birding consultant from Duluth, Minnesota.

Introduction

Grand Portage National Monument is located in northeastern Minnesota and wholly within the Grand Portage Band of Minnesota Chippewa Reservation (Figure 1). Monument property is distributed as two blocks of land on the shore of Lake Superior (28 ha) and the banks of the Pigeon River at Fort Charlotte (36 ha), with a 183 m-wide, 13.4 km trail corridor (220 ha) connecting the two. Elevations range from lake level (183.5 meters above sea level) to nearly 427 m along the western third of the trail. Near-boreal mixed hardwood-conifer forest covers the trail corridor and Fort Charlotte with limited interruptions of lowland brush along three short stream segments and a single wetland area. The lakeshore area of the Monument offers the only other habitat diversity. Half the lakeshore area consists of a highly maintained lawn with shrub borders, mature pine and spruce plantations, and a grass and sedge meadow; the rest is covered with a birch-aspen-spruce-fir forest.

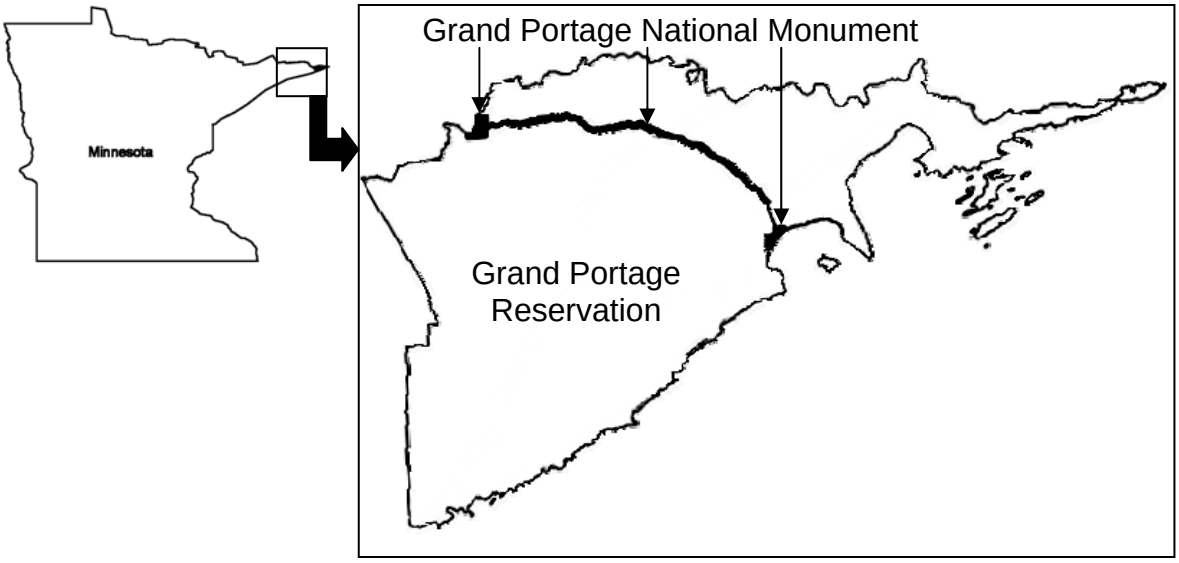

Figure 1. Location of Grand Portage National Monument in northeast Minnesota. Fort Charlotte is located at the left (west) end of the Monument trail corridor (heavy dark line).

Efforts to survey bird species in Grand Portage National Monument relied mostly on casual observations and a limited number of contracted projects prior to 1999. During the fall of 1992 and the summers of 1993 and 1994, a University of Wisconsin graduate student conducted a terrestrial vertebrate inventory of the Monument which included opportunistic, transect and point sampling for birds (Graetz et al. 1995). This produced a list of 102 bird species that were classified as migrants, or as summer, winter, or permanent residents of the local area. Breeding bird surveys were initiated in 1997 using recognized experts of the local bird fauna. Sampling methods and locations evolved until 1999 when nearly the entire Monument property was surveyed with point-centered counts loosely based on the U.S. Geological Survey breeding bird

survey protocol (Hoffman 1998, 1999). These efforts produced a list of 113 documented species in the Monument.

Short-term summer inventories do not reveal the full complement of birds likely to occur in the birch-aspen-spruce-fir forests of the Monument or along the shore of Lake Superior. Some migrants and winter residents may only be observed on extremely rare occasions requiring consistent observation over many months or years (e.g., Tundra Swan, *Cynus columbianus*, or Spruce Grouse, *Falcipennis canadensis*). Breeding bird surveys are conducted in early morning hours during peak of the songbird breeding season. This method does not routinely detect spring or fall migrant species, winter residents, or species primarily active or which call at night. Since 1999, observation of unusual birds and migrants has benefited from several seasonal rangers with training in species identification and a permanent natural resource staff person. Unusual observations have been verified and documented before adding to the Monument bird list. Even with these additional sources of information, the proportion of verified species compared to those expected to be present in the Monument was only 86.6% by 2000.

The Great Lakes Inventory and Monitoring Network (GLKN) provided funding during FY2002-FY2004 to survey birds not routinely detected by the methods previously used, specifically species that call at night. Three groups of night-calling species were targeted in this survey: owls, marsh birds, and other upland species (Table 1; USGS alpha codes will be used in this report instead of species' common or scientific names). A few of these species had been previously reported, either from formal sampling during inventories and breeding bird surveys, or by casual observations of staff (Graetz et al. 1995; Hoffman 1997-2000).

Table 1. Target species for Grand Portage National Monument night-calling bird survey, 2002-2004.

Species Group/Common Name	Scientific Name	USGS Alpha Codes	Previously Reported
Owls:			
Great Horned Owl	*Bubo virginianus*	GHOW	Yes (Graetz et al.)
Great Gray Owl	*Strix nebulosa*	GGOW	No
Barred Owl	*Strix varia*	BDOW	Yes (Graetz et al.)
Northern Saw-whet Owl	*Aegolius acadicus*	NSWO	No
Boreal Owl	*Aegolius funereus*	BOOW	No
Northern Hawk Owl	*Surnia ulula*	NHOW	No
Long-Eared Owl	*Asio otus*	LEOW	No
Short-Eared Owl	*Asio flammeus*	SEOW	No (rare migrant)
Snowy Owl	*Nyctea scandiaca*	SNOW	No (winter migrant)
Marsh species:			
Wilson's Snipe	*Gallinago delicate*	COSN	Yes (Graetz et al., BBS)
Sora	*Porzana carolina*	SORA	No
Virginia Rail	*Rallus limicola*	VIRA	No
Yellow Rail	*Coturnicops noveboracensis*	YERA	No
Pied-Billed Grebe	*Podilymbus podiceps*	PBGR	No
American Bittern	*Botaurus lentiginosus*	AMBI	Yes (BBS)
Upland species:			
American Woodcock	*Scolopax minor*	AMWO	Yes (Graetz et al.)
Common Nighthawk	*Chordeiles minor*	CONI	No
Whip-poor-will	*Caprimulgus vociferous*	WPWI	No
Ruffed Grouse	*Bonasa umbellus*	RUGR	Yes (multiple)

Methods

Owls

The sampling protocol used for this survey was consistent with methods used elsewhere in Minnesota by the Department of Natural Resources (Benson, pers. comm.), on national forest lands (Lane 2001a), and similar to the method used for surveys in Canada (Hildebrand et al. 2002). The original proposal for this study specified an initial silent listening period followed by playback of recorded calls for the species anticipated to occur in the area. Use of call playbacks has been dropped by most owl surveyors for a number of statistical and ecological reasons. Leaving this component out of the sampling protocol reduces the possibility of double-counting birds that follow the perceived "intruder" from point to point. Such artificial "intruders" also place additional stress on birds that may already be stressed by weather conditions and exigencies of the breeding season. For the purposes of this study, using the same method as other researchers in the immediate area provides the best means of comparing the results obtained.

Sample points located a minimum of 0.8 km apart were established along Grand Portage Reservation roads and the Monument trail corridor (Figure 2). Sites were selected based on reliability of access by vehicle and foot under winter conditions. Sites 3, 5, 6, 15, 18 and 19 were reached on foot along the trail corridor, while sites 1, 2, 4, and 10-14 were sampled from road shoulders. Five additional sample points were initially planned along Poplar Creek (7-9) and Cowboys roads (16 and 17), but these roads were maintained for snowmobile access during the early part of survey periods and were too muddy for vehicular access late in the survey period. As a result, these points were dropped from sample collection. Placement of the remaining 14 sites resulted in sampling approximately 50% of Monument property.

Sample collection began at least 35 minutes after local sunset on evenings when winds were less than 24 kilometers per hour (kmph) and with no or very light precipitation. Snow cover and depth, sky conditions, air temperature, wind speed and moon phase were recorded at the beginning and end of sample collection. The direction of sampling alternated (points 1 to 19 and 19 to 1) on successive collection dates. Owls heard during three-minute listening periods were recorded by species and bearing from north. Distance was estimated and used with bearing information to avoid double counting birds heard from more than one sample point. Additional owls heard or observed between sample collections were also recorded but not included in reported totals.

The sample period stretched from mid-March to mid-May in order to detect the widest range of calling owl species. Large species, such as the GHOW, establish nests as early as January and may cease calling by late March. The breeding seasons of smaller species start in late winter and may continue into mid-May. Five or six collection dates were scheduled each year to allow for weather-related cancellations, which occurred in all years. Four collections were obtained each year at roughly two-week intervals.

Difficulty arose during the first year of the survey in definitively distinguishing BOOW calls from the flight sounds of COSN. Since preferred habitat for these two species coincided along the survey route, and COSN were clearly present during later sample periods, it presented a serious concern. This situation was remedied by contracting a regional birder with excellent

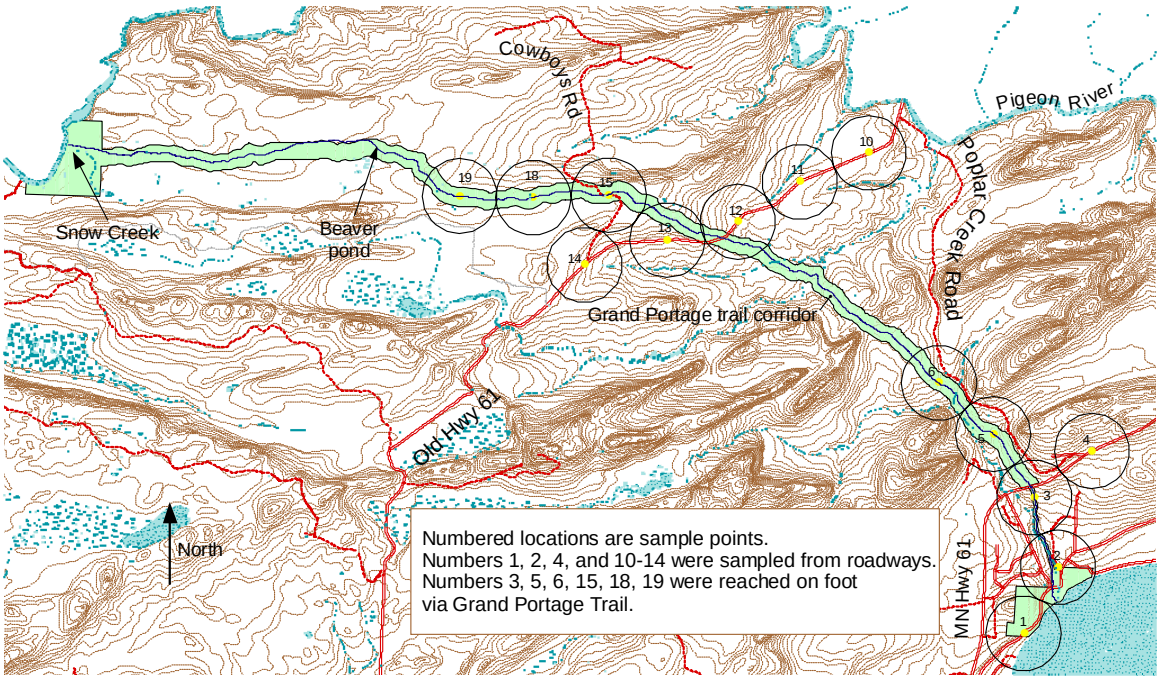

Figure 2. Sample points for owl calling survey, Grand Portage National Monument, 2002-2004.

hearing and identification skills to accompany the Principal Investigator (PI) for the final sample period in 2003 and all four in 2004.

Encounter indices have been used by other researchers to provide rough density estimates for individual owl species (Lane 2001a). Detection rate is the number of owls detected per total km surveyed (owls/effort) and the abundance index is the number of individual owls detected per linear route length (km). Calculating these indices using the total number of owls of all species provides information on the entire owl community in the area surveyed.

Long-term monitoring of boreal forest owls along the north shore of Lake Superior suggests that weather conditions before and during the breeding season may have profound effects on nesting efforts (Lane 2001b). Heavy snow cover was considered a contributing factor to widespread die-off of small species during the winter of 2000-2001. Inability to hunt successfully led to starvation, and owls that survived apparently wasted no energy on calling or nest production (Lane 2001b). For this reason, weather conditions recorded at the Grand Portage Band Trust Lands and Resources facility for the winters of 2001 through 2004 were examined for any correspondence between climate effects and the number of owl detected in this survey.

Marsh Birds

Marsh birds typical of the region are not well represented on the Grand Portage National Monument species list for two reasons: limited suitable habitat and the difficulty of reaching that habitat for sampling. The small amount of marshy stream margin along Snow Creek at Fort Charlotte can only be reached by driving 8 km on a four-wheel drive trail and then hiking 2.4 to 3.2 km. The beaver pond over which the trail crosses requires a 4 km hike from the nearest

logging road. The best time to listen for night-calling marsh birds in this region is after nightfall during mid-June. Accessing the remote marshy areas at dusk places researchers at the mercy of dense clouds of mosquitoes, which are at the peak of their season, too. For this reason, a single sample was collected at the beaver pond each year of this survey. In order to increase the reliability of reports, the PI recruited other persons trained in call identification. These were Steve Veit and Shannon Judd, seasonal park employees with ornithological training, in 2002; Steve Stuckey, bird specialist with the Minnesota Department of Natural Resources County Biological Survey, in 2003; and Joan Elias, the GLKN aquatic ecologist, in 2004.

Sampling consisted of playing recorded calls of a target species, then listening several moments for a response, then playing the next recorded species. The same procedure was used near both ends of the 200 m-long boardwalk that traverses the beaver dam. Any response was recorded to species. Weather conditions were recorded for each sampling effort to ensure winds were not a factor in call detection.

Upland Birds

The upland species targeted in this night-calling bird survey (Table 1) represent two groups: those with abundant habitat locally, and those with limited habitat in the Grand Portage area. The mixed hardwood-coniferous forests that cover most of the Monument provide ample habitat for RUGR. Also a species of moist woodlands, AMWO prefers more open areas for display, such as rocky ridge tops, recently logged sites, and grassy areas. In contrast, the open and sparsely wooded habitats preferred by CONI and WPWI are currently rare on the Reservation, and the few which are present are limited in size.

The calling/display season for AMWO and RUGR begins early enough in the spring that opportunistic detection and recording was possible during owl sampling periods.
Unusually early migrations of CONI or WPWI might have been detected during the final owl sampling period (Janssen 1987), but these species typically arrive later in the spring.
Targeted sampling was conducted in May and June for these species by listening for 20-30 minutes after dusk in suitable habitats. A shrub bordered meadow in the lakeshore unit of the Monument was visited in May and June, 2002 and 2003, for AMWO and CONI. An open-to-shrubby site on a rocky hillside adjacent to the trail corridor was sampled for WPWI in June 2002 and 2003, on the same dates as marsh bird sampling.

Results

Owls

The four sample periods for each year of the owl survey were distributed over three time frames related to the typical breeding seasons of the various owl species (Table 2). The late winter samples in mid-March would have been near the end of the calling season for the large, early breeding owls, such GHOW and GGOW. Early spring samples, from the end of March through mid-April, were intended to detect calls of migrant species (LEOW, NHOW) and early individuals of late-season breeders. The final samples in mid-spring would detect late-season, resident breeders (NSWO, BOOW).

Table 2. Sample dates and owl observations from the night-calling bird survey at Grand Portage National Monument, 2002-2004. Birds heard outside three-minute sample periods, or with questionable identification, are in parentheses and are not counted in survey totals.

	2002	2003	2004
Late winter			
11 March	--	--	No calls detected
14 March	No calls detected	--	--
17 March	--	No calls detected	--
Early spring			
1 April	--	2 NSWO 2 BDOW 1 GHOW	3 NSWO (1 BDOW)
15 April	(?, 2 BOOW)	--	--
29 March	1 NSWO (1 NSWO)	--	--
Mid-spring			
22 April	--	--	2 NSWO
30 April	2 NSWO (?, BOOW) (?, GGOW)	1 GHOW	--
6 May	--	--	4 NSWO
15 May	--	3 BDOW 1 GHOW (?, BOOW)	--
TOTALS	3 NSWO	2 NSWO 5 BDOW 3 GHOW	9/(7?) NSWO

Owls were recorded 22 times during three-minute sampling periods from 2002 through 2004: 14 NSWO, five BDOW, and three GHOW. By evaluating distance and bearing information, four of the NSWO detections in 2004 may have been just two individuals: one heard from consecutive sample points, and one heard on consecutive sample dates from adjacent sample points. An

additional seven owls were detected either outside of sample periods (one NSWO, one BDOW, and a probable GGOW), or during sample periods but identification was tentative (four BOOW).

Rough density estimates were obtained by calculating detection rate and abundance indices based on owl detections per sample year (Table 3). Because four detections in 2004 may have been from just two individuals, a total of nine and seven were both used for that year. With a survey route length of 11.3 km, abundance was calculated to be 0.60 to 0.65 owls/km. Over the entire survey period (four samples collected per year), the average detection rate was 0.15 to 0.16 owls/km (route length x 4=45.2 km).

Table 3. Abundance estimates for an owl calling survey of Grand Portage National Monument from 2002 to 2004. Survey route was 11.3 km.

	Detection Rate (# owls/total km surveyed)	Abundance Index (# owls/km of route surveyed)
2002	0.07	0.27
2003	0.22	0.88
2004 (9/7)[1]	0.20 / 0.15	0.80 / 0.62
Average (9/7) [1]	0.16 / 0.15	0.65 / 0.60

[1] Four detections in 2004 may have been from just two individuals; therefore, a yearly total of 9 and 7 were both used for comparative purposes.

Winter weather conditions varied considerably over the years this survey was conducted (Figures 3-6). Wet conditions in 2001 were followed by two years of dry weather, especially in 2003 which had nearly 10 inches less annual precipitation than average (Figures 3 and 4); precipitation returned to near normal in 2004 (Minnesota Climatology Working Group 2004). Temperatures also varied widely and were not correlated with snowfall. Temperatures in both 2001 and 2004 were near normal levels, but winter 2002 was somewhat warmer than average, while late winter 2003 was notably colder than usual (Figures 5 and 6).

Marsh Birds

Two of the six marsh species targeted in this study had been detected during earlier work. Wilson's snipe was reported as a migrant of relatively low abundance from the Monument beaver pond by Graetz et al. (1995), and a single AMBI was reported at Breeding Bird Survey point 31 by Hoffman and Hoffman in 2000. Monument staff have reported auditory detections of COSN at Snow Creek and at the beaver pond. The spring migration of COSN to this area is early enough that additional detections were made at sample points 18 and 19 during owl call sampling efforts in 2002 (30 April, 15 May) and 2003 (22 April).

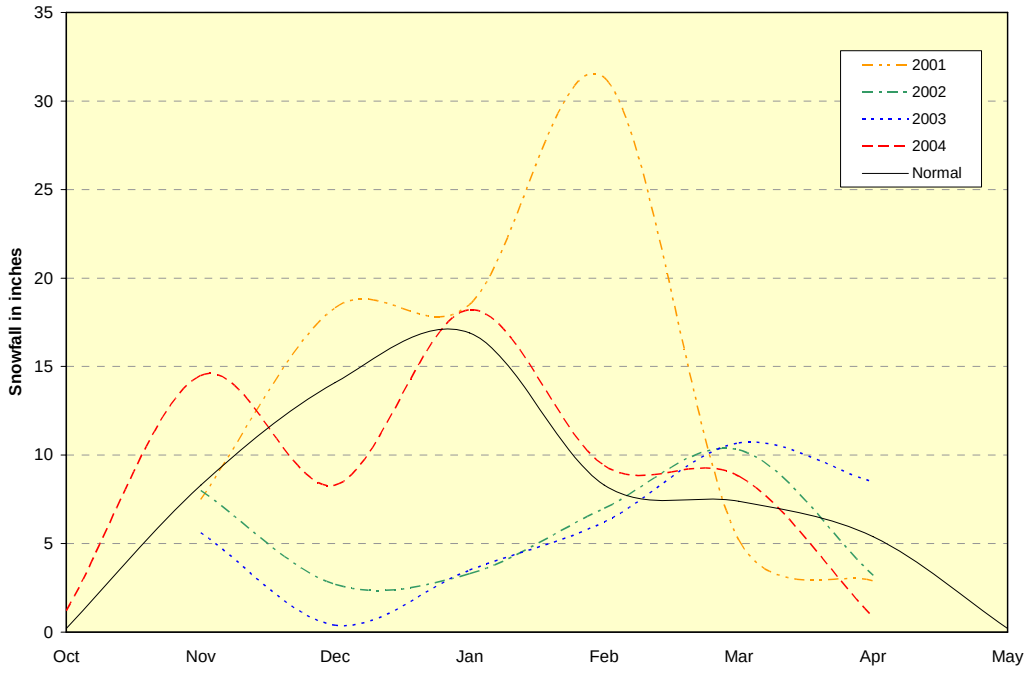

Figure 3. Monthly average snowfall (inches) for winters of 2001 to 2004 at Grand Portage, Cook County, MN.

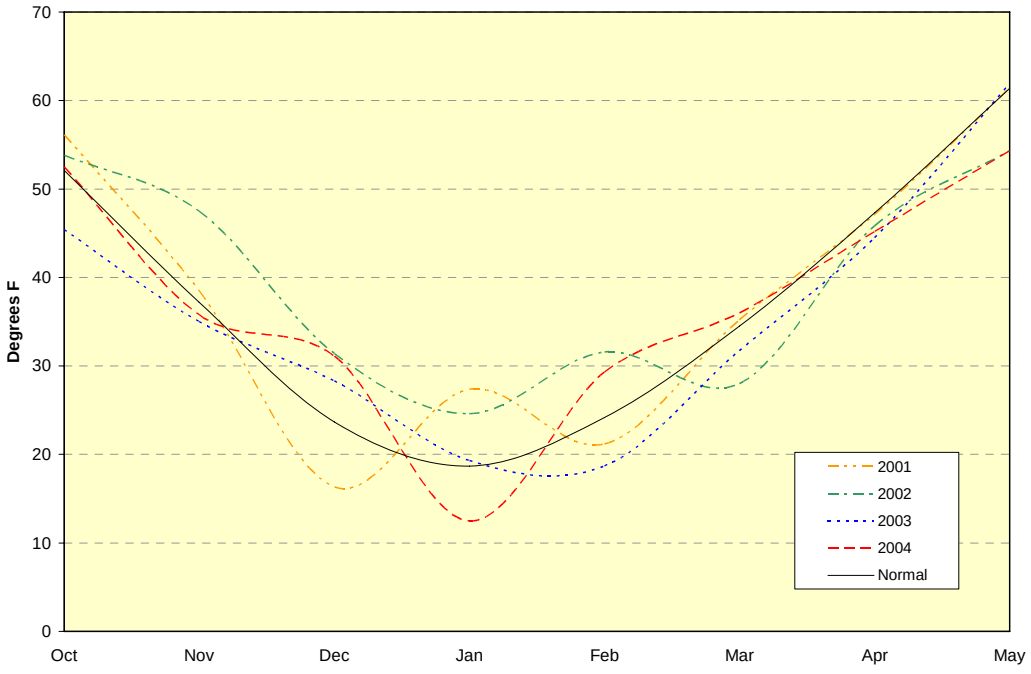

Figure 4. Monthly average snow depth (inches) for winters of 2001 to 2004 at Grand Portage, Cook County, MN.

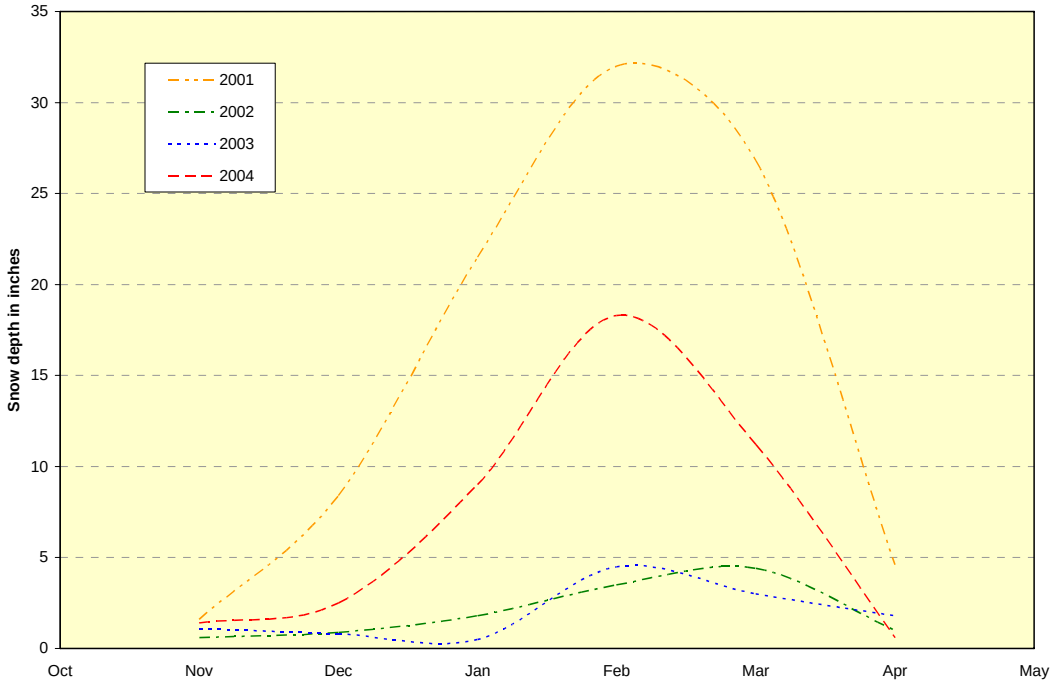

Figure 5. Monthly average maximum temperature (°F) for winters of 2001 to 2004 at Grand Portage, Cook County, MN.

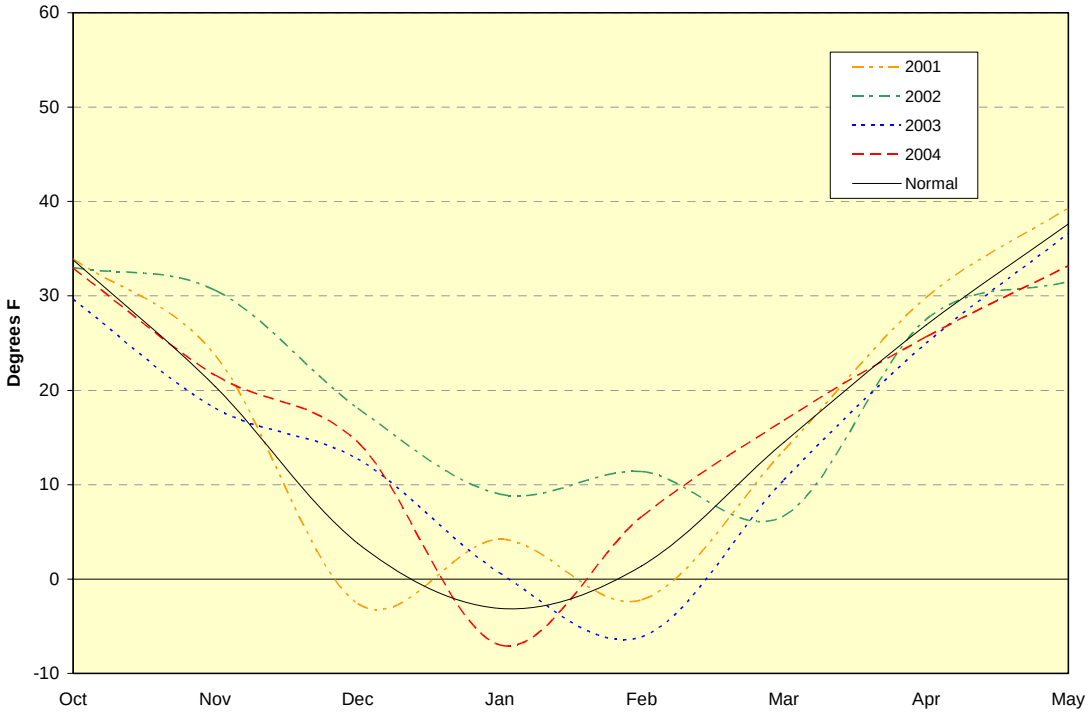

Figure 6. Monthly average minimum temperature (°F) for winters of 2001 to 2004 at Grand Portage, Cook County, MN.

The three late spring sampling efforts of this survey that targeted the beaver pond yielded only one additional detection of COSN and a single SORA, both in 2002.

Upland Birds

Both RUGR and AMWO were previously reported within the Monument by multiple sources (Graetz et al. 1995; Hoffman 1997-2000; staff observations). Most Monument property is suitable habitat for RUGR, so there are abundant opportunities to hear drumming males throughout the courtship period. While conducting the owl survey, RUGR were noted at several sample points on 30 April 2003 and on 22 April and 6 May 2004.

Several sample points (1, 2, 10 and 11) were near habitat suitable for AMWO courtship displays and permitted recording of this species concomitantly with owl sampling. The distinctive call notes and flight sounds of several males were heard on 30 April 2003 and on 1 April and 6 May 2004. Specific sampling near point 2 on 24 May 2002 yielded AMWO and CONI, the latter species apparently nesting on the roof of the nearby community school. Another observation of CONI was reported from the lakeshore area on 16 June 2003 by a seasonal ranger.

Targeted listening for WPWI as part of this survey resulted in negative results. No reports of WPWI in the Grand Portage area were recorded between 2002 and 2004.

Discussion

In general, the limited information collected in this short-term survey of Monument and Reservation lands should not be overly interpreted. The results provide an inventory of species that commonly occur in the Grand Portage area. Failure to detect rarely occurring or vagrant species during the course of this study does not imply they never occur within the Monument. Detection of uncommon species requires persistent observation over long periods of time, perhaps years. Because of this, anecdotal sighting reports from current and past employees are important contributions to the verified species list. Such information is included, by species, in the Appendix, along with a summary of calls, preferred habitats, and distribution. The likelihood of observing species within the Monument is then discussed based on the prevalence of suitable habitats, and the sighting history is summarized.

Owls

Owl detection rates obtained in the 2002-2004 NPS survey can be cautiously compared to data from other studies that used similar sampling methods. An average detection rate of 0.15 to 0.16 owl/km is within the range of results obtained in Manitoba surveys (Hildebrand et al. 2002). Although more owl species were present and a wider variety of habitats were sampled by the Canadian studies, they obtained a detection rate of 0.17 owl/km for 1,070 km surveyed in 2001, and 0.13 owl/km for 2,008 km surveyed in 2002 (Hildebrand et al. 2002). This similarity in results suggests that an optimal owl density, irrespective of species, may occur in sub-boreal forest communities.

During 2005, an owl survey was conducted on the Reservation as part of a Western Great Lakes Owl Survey (Natural Resources Research Institute [NRRI], unpublished data). The sample routes for this study and the NPS survey overlapped in the mid-trail corridor area along Old Highway 61. The PI and sample methods were the same for both studies, although only three samples were collected between mid-March and mid-April 2005. A detection rate of only 0.08 owl/km was found in 2005 (five owls/60km). However, there was a near absence of NSWO calls reported from the Grand Portage area during the early spring. Only one was heard during the survey outside of a sample time period. Reports from the Grand Portage village area, where several males are typically heard each spring, indicated calling was delayed in 2005, with one report from mid-May and another around 4 July 2005 (Whiting and S. Veit, pers. comm.). This delay may have contributed to the lack of NSWO detections during the 2005 survey, resulting in a low detection rate, but it may not be the only influence on NSWO presence in the area.

Detection trends in northeast Minnesota suggest that increasing numbers of BDOW are adversely affecting smaller owl species populations. The number of BDOW has steadily increased in the Superior National Forest (SNF) in recent years, while numbers of small owls (NSWO and BOOW) have declined (Lane, pers. comm.). This trend appears to have increased markedly since the 1999 "blowdown" that altered large swaths of habitat in the SNF (Lane, pers. comm.). Conditions favorable for increasing BDOW populations within the SNF could lead to increased populations in surrounding areas as young disperse. Results of the NPS and NRRI surveys, along with observations of the PI while conducting frog and toad calling surveys, indicate BDOW is currently the most likely species to be detected on Grand Portage Reservation lands.

In addition to the effect BDOW presence may have on other owl species, climatic conditions and prey base can also dramatically influence the owl species detected during certain times. One response to adverse weather conditions was demonstrated in 2001. The deep snow of 2001 (Figure 4) made feeding difficult, especially for smaller species, and the remains of many starved owls were found throughout northeast Minnesota. Surviving stressed individuals had inadequate food resources to support nesting activities (Lane 2001b.). Although weather conditions in 2002 were mild, with warm temperatures and little snow, decimation of owl populations in the previous winter contributed to the lowest detection rate that year among the three years of the NPS study.

The influence of prey availability was demonstrated during the fall and winter of 2004-2005 when an owl irruption of historic significance occurred throughout the upper Midwest. In response to short food supplies, hundreds of GGOW, NHOW and BOOW moved through northeast Minnesota very early in the fall and wintered as far south as Iowa (Minnesota Ornithological Union 2005).

Marsh Birds

The lack of success in recording marsh-dwelling, night-calling species reflects the general lack of appropriate habitat within the Monument. Currently, a boardwalk carries the Grand Portage trail across a 200 meter beaver dam between Cowboys Road and Fort Charlotte (Figure 2). The meadow complex directly above this dam is about 37,500 sq. meters in extent, but less than 3% of this is open water, and most of that is directly adjacent to the boardwalk, where the water is greater than 1 m deep. Shrubby plant growth borders the open water and extends over much of the meadow area, probably on floating vegetation mats. Many marsh birds, rails in particular, prefer grass-like plant cover and areas of shallower water (Stucker, pers. comm.). Detection of SORA in this area reflects its preference for dense marsh vegetation. In contrast, COSN are birds of wooded marshes and riverbanks, and the numerous detections of this species suggest it is a regular resident in the beaver pond along the Grand Portage.

Wetland vegetation along the confluence of Snow Creek with the Pigeon River at Fort Charlotte is greatly influenced by river stage. Fluctuating water levels probably make this area less attractive for marsh bird nesting than numerous marshes and bogs elsewhere in the vicinity. A beaver impoundment upstream on Snow Creek, but still within the Fort Charlotte unit, has little wetland vegetation and birch-aspen-spruce-fir woods growing right up to the steep-sided margins of the pond. Although this may currently be unattractive for marsh birds, this site might attract nesting species once suitable vegetation is established.

Upland Birds

This survey provided no additional night-calling upland species, but it did add information about previously recorded ones. One benefit gained from this survey is information about the onset of calling. Both RUGR, a resident species, and AMWO, a migrant, are abundant enough to be reliably detected each year. A standardized method for detecting the beginning of courtship displays should be investigated so that this simple phenological event can be documented for comparison among years.

A word of caution: onset of courtship displays does not represent the peak of courtship effort, nor does it provide an estimate of nesting success or population levels. Surveys based on acoustic samples detect courtship display effort (which is performed by males) only. Nesting success is not only a female activity, but is greatly affected by weather conditions through the spring and early summer. For example, Monument breeding bird surveys conducted in mid-June during 1999 and 2000 reported a single RUGR each year. Grouse nests were common enough along the trail corridor in these years that both visitors and employees reported several instances of "attack hens" defending their young. The breeding bird surveys were conducted 10-14 days earlier in 2002 and 2003, and reported 15 and 26 RUGR displays, respectively. However, no instances of aggressive hens were received in those years.

Confirmation of CONI suggests that this species, although not reliably present each year, commonly nests in suitable habitat in the vicinity of the Monument. There is likely no management action that would enhance the presence of this species in the park unit.

A combination of elevation, distance from Lake Superior, and suitable habitat seem to be necessary for the presence of WPWI along the north shore of Minnesota (D. Benson, pers. comm.). The importance of the correct suite of factors is demonstrated at a location overlooking Grand Marais, Minnesota, where WPWI are heard annually (Minnesota Ornithological Union, 2004). Few other sites in Cook County report WPWI in any year. Anecdotal evidence suggests that WPWI were once common at a site about 2 km southwest of the lakeshore unit of the Monument. It is possible that tree growth made conditions in this area less than ideal in recent years. Considering their loud and distinctive call, WPWI should be readily detected when they are present in an area. The difficulty is locating areas with the correct combination of factors to attract nesting birds. In the Grand Portage area, such sites are limited, but continued attention may reveal the sporadic presence of WPWI.

Conclusions

Owls

Owl species frequenting Grand Portage National Monument include, in order of prevalence in this survey: Northern Saw-whet, Barred, Great Horned and Great Gray owls. Occasional transient occurrences of Boreal, Northern Hawk and Snowy owls are likely, while appearances of Long-eared and Short-eared owls would be rare events. Based on detection rates from call surveys, the number of owls attempting to nest in the area is about the same as for other areas of sub-boreal-to-boreal forests.

Marsh Birds

Several detections of Wilson's Snipe suggest this species regularly uses the beaver pond area of the Monument for display and other purposes. A single observation of a Sora indicates conditions at the beaver pond are also suitable for this species. In general, the limited quantity and quality of marsh habitat makes other marsh species less likely to occur. Observation of an American Bittern during a breeding bird survey demonstrates the rarity with which other species may be detected. Recording Virginia or Yellow rails or Pied-billed Grebes in the Monument will most likely be by chance.

Upland Birds

Ruffed Grouse are common residents in the Monument, and observations and auditory detections are frequent occurrences. The flight displays of American Woodcock are readily observed at two sites in the lakeshore area, although nesting areas are not known. Common Nighthawk, although not nesting within the Monument, regularly hunt over the property in years they are present in the vicinity. Detection of Whip-poor-wills in the Grand Portage area requires an attentive ear in the few areas of suitable habitat.

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Appendix A. Natural history and occurrence information for night-calling birds in the Grand Portage area.

Select details regarding vocalizations or displays by night-calling bird species likely to occur within the Grand Portage National Monument or on the Grand Portage Reservation are summarized in this appendix in approximate taxonomic order. Estimates of the probability of occurrence in these areas and reports of observations are based on information gathered by the National Park Service (NPS) resource management assistant between 1999 and 2005. Probability of occurrence estimates are based on habitat conditions within Monument lands and limited knowledge of habitats elsewhere on the Reservation, primarily those areas readily accessible from roads proximate to the Grand Portage trail corridor. Similarly, reported observations are not represented as complete because additional knowledge of sightings may exist in the Grand Portage community.

Pied-billed Grebe, *Podilymbus podiceps*

Voice: The song of the Pied-billed Grebe is a long series of throaty notes that may be heard from great distances. It begins with clear bell-like notes that transition into a cuckoo-like "cow, cow, cow, cowp, cowp." Females also sing, but usually omit the cuckoo-like ending sounds. Pairs sometimes sing duets and perform displays with mutual diving and resurfacing combined with wing flapping and splashing (Cornell Lab of Ornithology 2002).

Habitat: Pied-bill Grebes use a variety of freshwater habitats including marshes, sloughs, small ponds, and the edges of rivers and lakes. They prefer bodies of water with emergent vegetation such as cattails or bulrushes with adjacent open water for foraging. They may use ponds as small as ½ an acre (Cornell Lab of Ornithology 2002).

Distribution: Pied-billed Grebes breed from southern Canada and southeastern Alaska throughout the United States, Central America, and the West Indies, and as far south as southern Argentina (Figure A-1; Cornell Lab of Ornithology 2002).

Probability of occurrence in Grand Portage National Monument: Although a few wetlands with emergent vegetation occur within the Monument, none of these have an adequate area of open water for foraging. A beaver pond within the Fort Charlotte area may provide suitable habitat once emergent vegetation is established, and this area could be monitored for Pied-bill Grebe in the future.

Reported sightings: Pied-billed Grebe have been observed throughout the spring and summer on Little Lake, a natural wetland about 1 mile east of the lakeshore area of the Monument. This documents the presence of grebe in the area during the nesting season, and suggests that if suitable habitat was available, the species would occur within the Monument also.

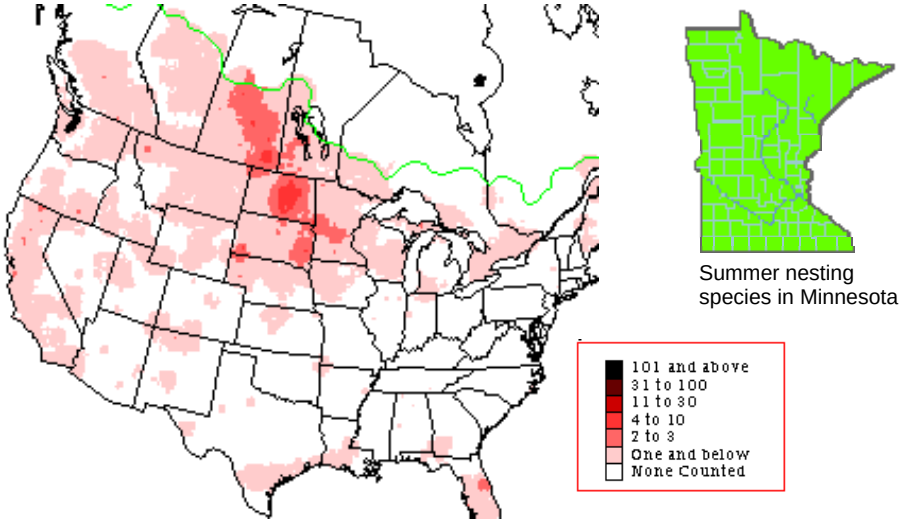

Figure A-1. Distribution of Pied-billed Grebes in North America and Minnesota, as reported from national breeding bird surveys and state nesting records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Ruffed Grouse, *Bonasa umbellus*
Voice/Display: Male Ruffed Grouse "drum" from fallen logs to attract females with a rapid beating of the wings to produce a series of deep thumping sounds that increase in tempo. Male may mate with more than one female, and females may visit several males. After copulation, males have nothing more to do with raising the young (Cornell Lab of Ornithology 2002).

Habitat: Ruffed Grouse are found in aspen woodlands and early successional mixed deciduous forests, with small clearings.

Distribution: Ruffed Grouse are year-round residents in deciduous and mixed forests from central Alaska, throughout Canada, and southward to northern California, Utah, and northern Alabama (Figure A-2).

Probability of occurrence in Grand Portage National Monument: Some of the commercial forestry practices of the Grand Portage Band are designed to enhance Ruffed Grouse habitat by creating small clearings and enhancing regrowth of aspen. Along the trail corridor of the Monument, wind-throw and death of individual trees provide occasional openings in the mixed forest canopy. Increasing dominance of balsam fir and lack of young aspen stands may make conditions along the trail corridor less favorable for grouse than in past decades.

Reported sightings: Ruffed Grouse have been documented within the Monument by several survey efforts including the vertebrate inventory of 1992-1994 (Graetz et al. 1995), breeding bird surveys (1999-2000, 2002-2003), and the night-calling bird survey (2002-2004). Casual

observations are numerous in the years when numbers are high, and common during other times of the population cycle.

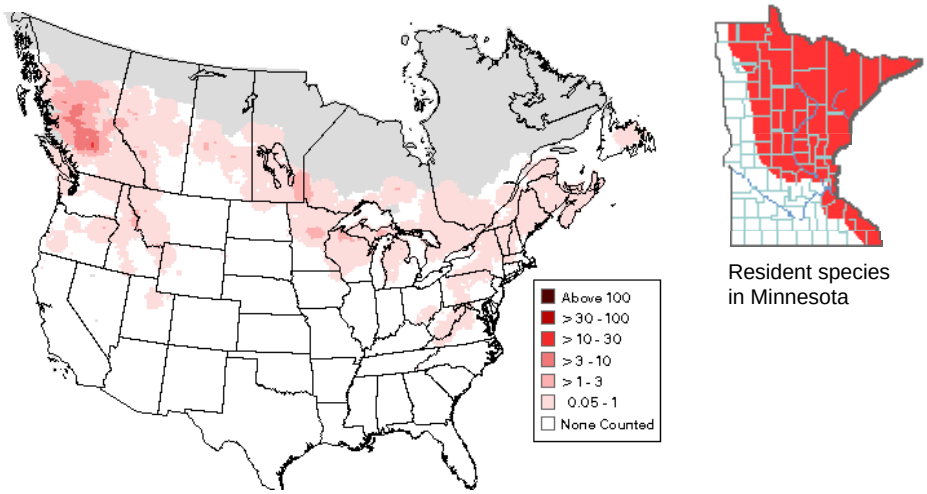

Figure A-2. Distribution of Ruffed Grouse in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

American Bittern, *Botaurus lentinginosus*

Voice: The American Bittern's vocal performance starts with its head and neck raised upward and several snaps of its bill. After this call to attention, the bittern follows with a three-note "Pump-er-lunk" or "Oong-ka-choonk" while throwing its head and neck forward like a fisherman casting a lure. The distinctive call of the "slough pumper" carries more than a half-mile (Cornell Lab of Ornithology 2002).

Habitat: American Bitterns rely on semi-permanent or permanent wetlands and open marshes with tall emergent vegetation. Ideal habitat typically includes a marsh with open water in the center and adjacent grassland. Nests may be placed both in the marsh grasses and cattails of a wetland or wet meadow and in the drier grassland as far as 100 yards from water (Cornell Lab of Ornithology 2002).

Distribution: American Bitterns are found throughout most of Canada and the United States from the southern Northwest Territories to south-central California in the West and from southern New Brunswick to South Carolina in the East (Figure A-3; Cornell Lab of Ornithology 2002).

Probability of occurrence in Grand Portage National Monument: Although wetlands are numerous in the Grand Portage area, they are most often bordered by woodlands, rather than grasslands as preferred by American Bitterns. It is likely that a few birds summer on the Reservation regularly, but finding American Bittern within Monument lands is uncommon.

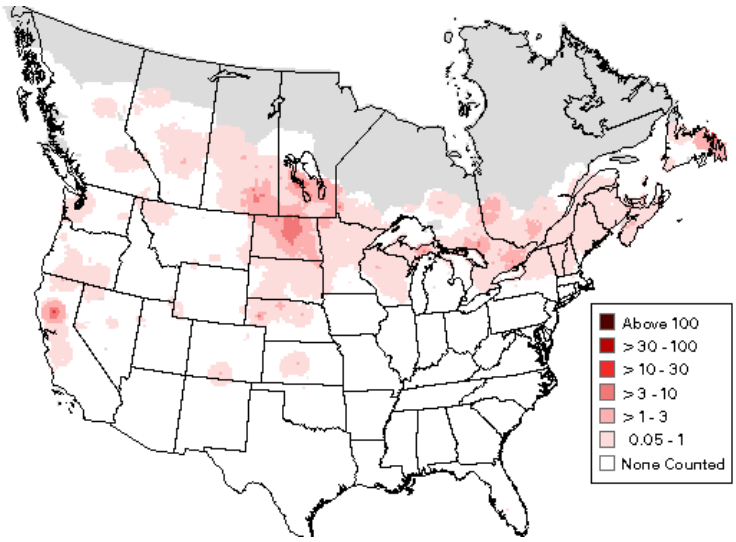

Figure A-3. Distribution of American Bittern in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Reported sightings: A single individual was reported during a breeding bird survey on 19 June 2000 about 0.5 mile west of the beaver pond, apparently from along Snow Creek near the edge of Monument property. In 2004, an individual was noted at Little Lake, about 1 mile east of the lakeshore area of the Monument. Reports from seasonal rangers indicate this bird called for several weeks, but it is not known if breeding efforts were successful.

Sora, *Porzana carolina*

Voice: Small and secretive, Sora are more often heard than seen. The call is a distinctive whinny, descending in pitch and slowing at the end, "wheeee-ee-ee-ee-ee-ee" (Melvin and Gibbs, 1996). Sora are reluctant to fly but often reveal their presence by this distinct call.

Habitat: Shallow freshwater wetlands with lots of emergent vegetation, such as cattails and sedges (Cornell Lab of Ornithology 2002).

Distribution: Abundant and widespread throughout most of North America. Breeds from northern Canada southward to mid-U.S. Winters from southern U.S. to northern South America (Figure A-4; Cornell Lab of Ornithology 2002).

Probability of occurrence in Grand Portage National Monument: A preference for wetlands with dense emergent vegetation makes several areas of the Monument suitable for Sora, most notably the beaver pond along the western trail corridor. The wetlands and beaver impoundments along Snow Creek within the Fort Charlotte area may also provide suitable habitat, but these sites may be too limited in size to attract nesting Sora.

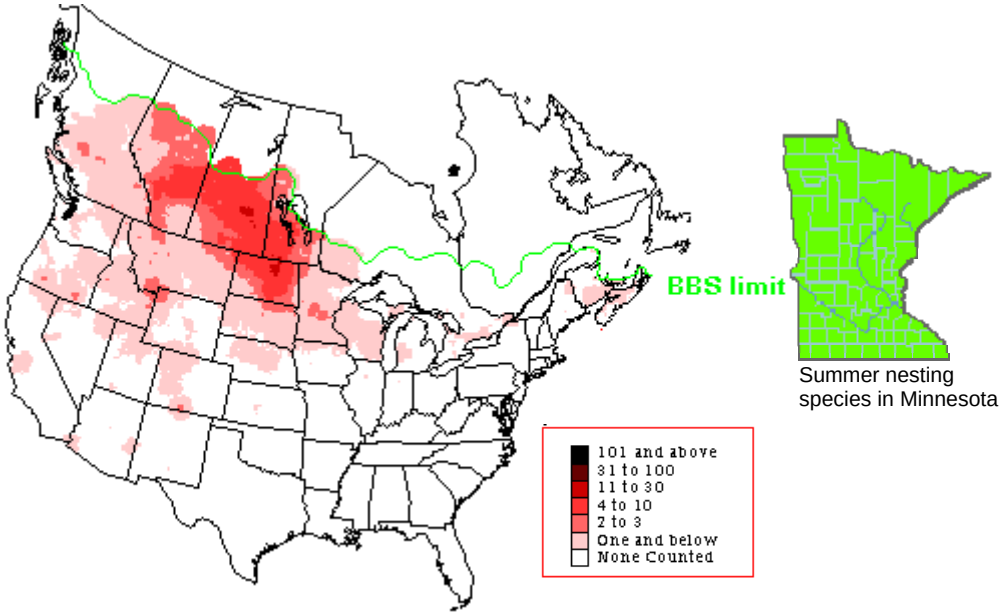

Figure A-4. Distribution of Sora in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Reported sightings: A single Sora was recorded near the boardwalk over the beaver pond on 18 June 2002. During a frog and toad calling survey on 12 June 2005, NPS resource staff heard another single Sora at Cuff's Lake, located about 3 miles southwest of the stockade area of the Monument. This species is probably regularly found in the Grand Portage area due to the number of marshes and shallow lakes on the Reservation. Future censusing along Snow Creek and at the beaver pond may provide information on how frequently they occur within the Monument.

Virginia Rail, *Rallus limicola*

Voice: The Virginia Rail is a secretive freshwater marsh bird that is more often heard than seen. Calls can be long sequences of pig-like grunts or a repeated "kid-dik kid-dik" (Cornell Lab of Ornithology 2002). Duetting grunt vocalizations, specialized calls used in pair-bonding, signal the start of the nesting season each spring (Conway 1996).

Habitat: Virginia Rails live in dense emergent vegetation of freshwater marshes, where it may often coexist with Soras (Conway 1996).

Distribution: Widely distributed in North and South America. Breeds in appropriate habitat from southern British Columbia to the maritime provinces, and from Baja California across the Great Plains to Pennsylvania, New York, and New England, and southward along the Atlantic coast to North Carolina. Within this range the Virginia Rail is restricted to isolated wetland areas, but can be locally abundant if habitat conditions are favorable (Figure A-5; Cornell Lab of Ornithology 2002).

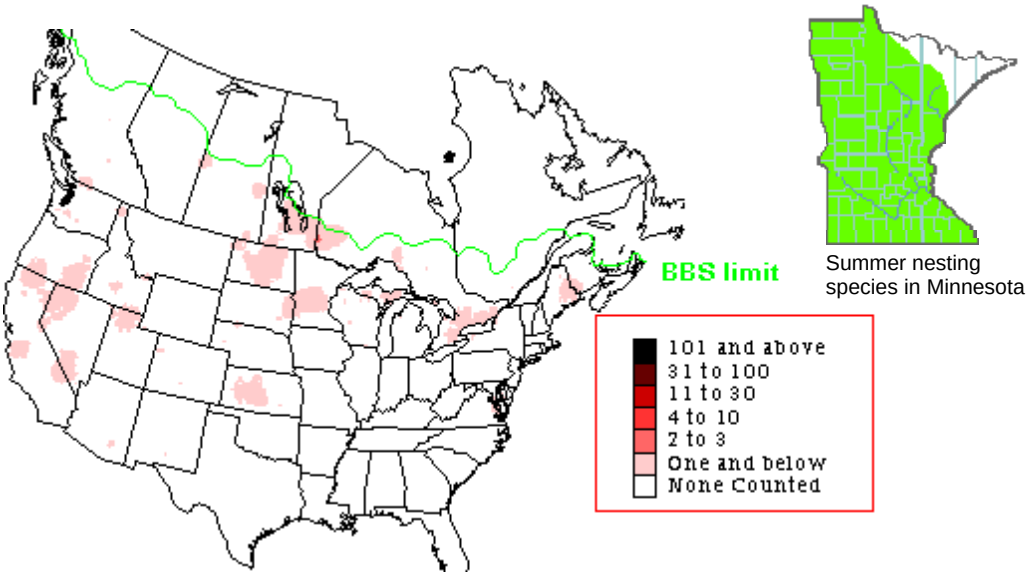

Figure A-5. Distribution of Virginia Rail in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Few observations of Virginia Rail have been made in Cook County (Janssen 1987), therefore the possibility of this species occurring in the area is limited. A preference for wetlands with dense emergent vegetation makes several areas of the Monument suitable for Virginia Rail, most notably the beaver pond along the western trail corridor. The wetlands and beaver impoundments along Snow Creek within the Fort Charlotte area may also provide suitable habitat, but these sites may be too limited in size to attract any nesting Virginia Rail that do occur.

Reported sightings: No observations of Virginia Rail have been made within the Monument. A single individual was heard calling near Cuff's Lake on 12 June 2005 by NPS resource staff. This species may be an occasional summer resident on the Reservation, but futher sampling will be needed to determine if they rarely occur in the beaver meadow of the Monument.

Yellow Rail, *Coturnicops noveboracensis*
Voice: The distinctive clicking calls of the Yellow Rail are given almost exclusively during the dark of night. The call is a metallic clicking with a strict cadence, "tic-tic, tic-tic-tic" which sounds much like an old manual typewriter (Cornell Lab of Ornithology 2003).

Habitat: Yellow Rails occur primarily in extensive shallow marshes and wet meadows of "wiregrass" sedge and sometimes bluejoint grass, with little or no shrub encroachment (Wisconsin DNR).

Distribution: Yellow Rails breed locally from Alberta to New Brunswick, southward to the northern U.S. (Figure A-6; Cornell Lab of Ornithology 2003).

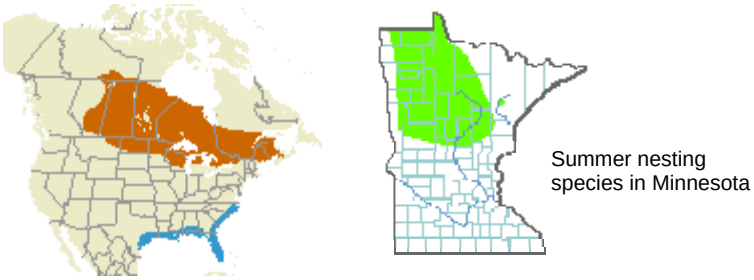

Figure A-6. Summer and winter distribution of Yellow Rail in North America, and state records from Minnesota (Cornell Lab of Ornithology 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: The wet grassland habitats preferred by Yellow Rail are relatively uncommon in the Grand Portage area, where most marshes border forested lands. Yellow Rail have been documented elsewhere in Cook County in relatively small areas of suitable habitat, but these areas are surrounded by agricultural fields, rather than forests. Occurrence of Yellow Rail in the Grand Portage area is unlikely, and observations within the Monument would be rare events.

Reported sightings: Yellow rail are irregularly reported along Co. Rd. 60 near Grand Marais, about 30 miles southwest of the Reservation. None have been reported within the Monument.

Wilson's Snipe, *Gallinago delicata*

Voice/Display: Winnowing, a hollow "hu-hu-hu" sound, is used by males to defend territories and attract mates. It is produced by air flowing over the outstretched tail feathers with each wing beat. The outer tail feathers are greatly modified to produce the sound and are thin and curved. The display call is a harsh "tuk-a-tuk-a-tuk," and a rasping "scaipe" sound is made when flushed (Cornell Lab of Ornithology 2002).

Habitat: Wilson's Snipe breed in bogs, fens, swamps, and around the marshy edges of ponds, rivers, and brooks. They forage in marshes, wet meadows, wet fields, and the marshy edges of streams and ditches (Cornell Lab of Ornithology 2002).

Distribution: Wilson's Snipe breed across Alaska and Canada, southward to central California, Colorado, Wisconsin, northern Ohio, and southern Maine (Figure A-7; Cornell Lab of Ornithology 2002).

Probability of occurrence in Grand Portage National Monument: Wet grassy spots suitable for Wilson's Snipe are abundant on the Reservation and common along stream courses in Monument lands, especially along the western half of the trail corridor. Snipe are probably present on a regular basis in the Monument but observations have been limited because of the remoteness of the locations in which they are most likely to occur.

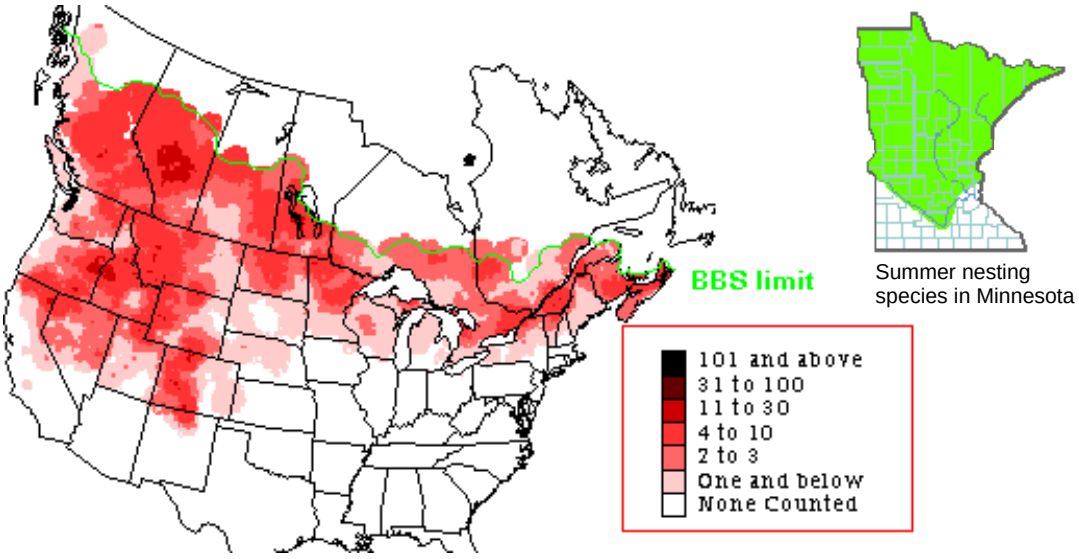

Figure A-7. Distribution of Wilson's Snipe in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005)

Reported sightings: Wilson's Snipe have been reported within the Monument by several surveying efforts including the 1992-1994 vertebrate inventory (Graetz et al. 1995), breeding bird surveys (2003 and 2004), and the night-calling bird survey (2002-2004). A casual observation was also made by NPS staff along Snow Creek at Fort Charlotte in May 2002.

American Woodcock, *Scolopax minor*

Voice/Display: American Woodcock are silent except for male display and twittering of wings in flight. Male woodcocks use flight displays to establish and maintain territories and court females. Displays are most common during spring mornings when males perform in small clearings for 50 to 60 minutes, and during evenings for 30 to 40 minutes. The male begins his display on the ground, where he produces nighthawk-like “peent” notes about once every 10 to 20 seconds. After launching himself into the air, he flies in a wide circle, wings twittering, until reaching 200 to 300 feet in the air. The twittering stops at the zenith of his flight, when he begins singing a series of varied chirping notes. He continues the song as he descends in an erratic zigzag flight to the ground, often landing close to the spot where he started. He then resumes the “peent” calls (Cornell Lab of Ornithology 2002).

Habitat: American Woodcocks build their nests on the ground in open woods or brushy fields (Cornell Lab of Ornithology 2002).

Distribution: American Woodcocks breed from southern Canada to the Gulf of Mexico and west to the eastern edge of the Great Plains (Cornell Lab of Ornithology 2002). Woodcock are regular spring and fall migrants through most of Minnesota, including the Arrowhead region, and breed in all wooded areas of the state (Janssen 1987). Early spring arrivals reach northern Minnesota by the last third of March (Figure A-8; Janssen 1987).

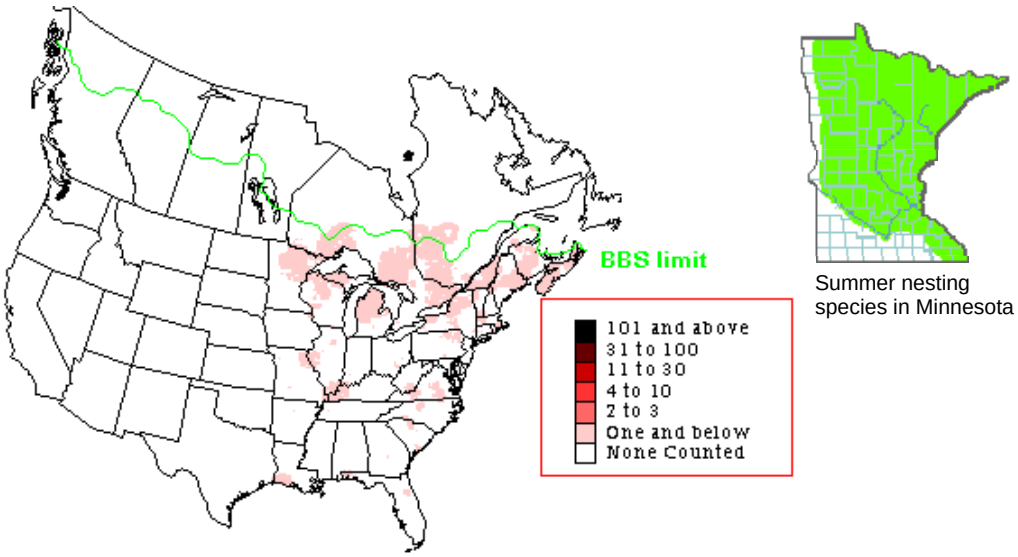

Figure A-8. Distribution of American Woodcock in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: It is common knowledge around the Grand Portage area that American Woodcock perform display flights near the open, shrub-bordered meadow in the lakeshore area of the Monument. Rocky knobs, ridge tops and recently cut areas where tree growth is sparse provide additions display areas. By late March it is relatively easy to observe American Woodcock in such areas.

Reported sightings: Reports of American Woodcock within the Monument are documented by Graetz et al. (1995), and by numerous detections during the 2002-2004 night-calling bird survey.

Great Horned Owl, *Bubo virginianus*

Voice: Great Horned Owls have a large repertoire of sounds, ranging from deep booming hoots to shrill shrieks. The male's resonant territorial call "hoo-hoo hoooooo hoo-hoo" can be heard over several miles during a still night. Both sexes hoot, but males have a lower-pitched voice than females. They give a growling "krrooo-oo" or screaming note when attacking intruders. Other sounds include a "whaaa whaaaaaa-a-a-aarrk" from disturbed birds, a catlike "MEEE-OWww," barks, hair-raising shrieks, coos, and beak snapping. Some calls are ventriloquial. Most calling occurs from dusk to about midnight and then again just before dawn (Owlpages.com).

Breeding: Nesting season is in January or February when the males and females hoot to each other (Owlpages.com).

Habitat: Great Horned Owls have adapted to a variety of areas and climates. They occur in habitats from dense forests, deserts and plains to city parks (Owlpages.com).

Distribution: Great Horned Owls are found throughout North America to the northern tree line. They are resident year-round; however, birds living in the northern part of the species' range may migrate south (Figure A-9; Owlpages.com).

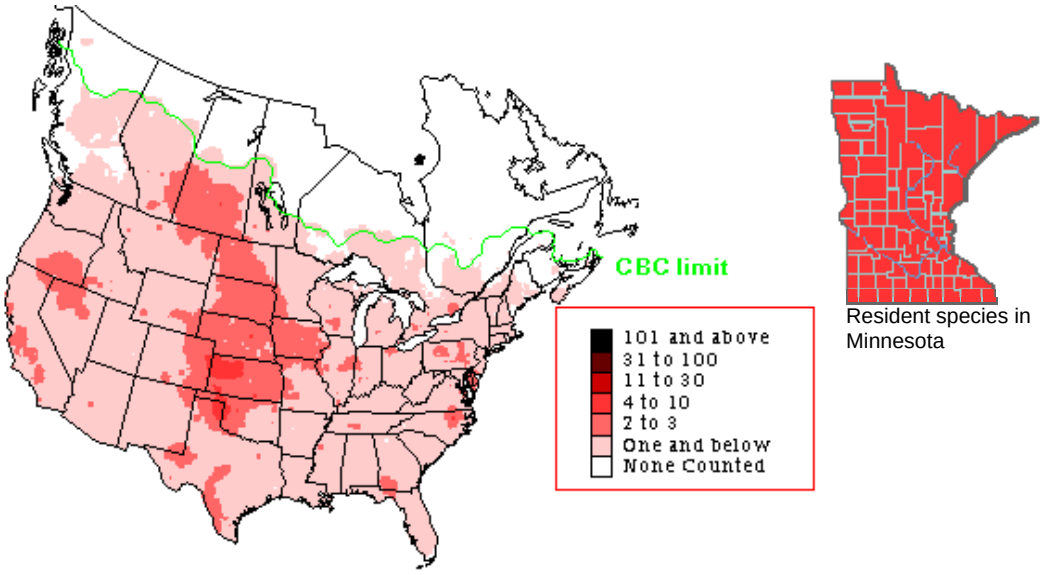

Figure A-9. Distribution of Great Horned Owls in North America and Minnesota, as reported on Christmas bird counts and from Minnesota state reports (Gough et al. 1998; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: The adaptability of Great Horned Owls to a wide range of habitats indicates that suitable conditions occur within the Monument. Although known nest sites have not been identified, it is likely that breeding pairs may occasionally nest on the property. It is more likely that these large birds use Monument lands for hunting purposes, especially along trail or road openings.

Reported sightings: Great Horned Owls were detected on three dates at separate locations (sample points 10, 1 and 18, in order of occurrence) in 2003. Assuming this were separate individuals may not be appropriate because of the large territories used by this species. An individual was also heard on 5 March 2002 during a training session arranged in conjunction with this survey. This bird was just east of the Village of Grand Portage and Monument lands. A few Great Horned Owls are probable resident in Grand Portage Reservation lands and occasionally used Monument property.

Barred Owl, *Strix varia*

Voice: The Barred Owl is a highly vocal owl giving a loud and resounding "hoo, hoo, too-HOO; hoo, hoo, too-HOO, ooo" which is often phrased as "Who, cooks, for-you? Who, cooks, for-you, all?" The last syllable drops off noticeably. The calls are often heard in a series of eight, then silence, when the owl listens for a reply from other owls. Other calls include "hoo-hoo, hoo-WAAAHH" and "hoo-WAAAHHH" used in courtship. Mates will duet, but the male's voice is

deeper and mellower. Many other vocalizations are made which range from a short yelp or bark to a frenzied and raucous monkey-like squall (Owlpages.com).

Breeding: Barred Owls call year-round but courtship activities begin in February with breeding occurring between March and August. Barred Owls nest in cavities and will also use abandoned hawk or crow nests (Owlpages.com).

Habitat: Barred Owls prefer deep moist forests, wooded swamps, and woodlands near waterways. Territories are 213-903 acres (Owlpages.com).

Distribution: The Barred Owl is widespread in North America, they occur across most of the eastern half of the continent from Florida northward to southern Canada; they are also spreading westward in the north of their range. Northern populations may be partially migratory depending on food resources (Figure A-10; Owlpages.com).

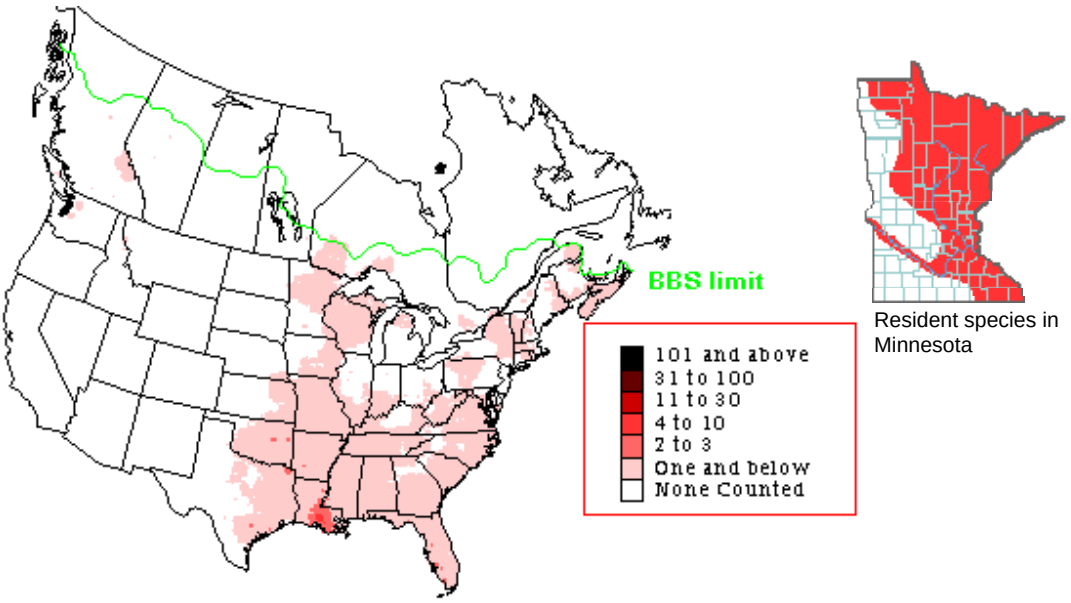

Figure A-10. Distribution of the Barred Owl in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Although bottomland woods are not a large portion of the forest types of the Monument, the territorial size for Barred Owls suggests that feeding birds may use portions of the property, especially near the beaver pond and Fort Charlotte areas which are near suitable habitats.

Reported sightings: Barred Owls were detected five times in 2003 during survey sampling, and once in 2004 outside of a sample period. The species has also been frequently detected during

other field surveys conducted at night on Reservation and Monument lands by NPS resource staff. Barred Owls are common in the area and may be increasing in numbers. The effect this will have on the presence of smaller owl species should be monitored.

Great Gray Owl, *Strix nebulosa*

Voice: The Great Gray Owl has a distinctive primary call which is a very soft, low-pitched hoot "whooo-ooo-ooo-ooo" with the notes emitted slowly over a 6 to 8 second period. Calls are repeated every 15 to 30 seconds. This call is used as a territorial declaration and can be heard up to ½ mile away under good conditions. Territorial calling begins after dusk, peaks before midnight, then peaks again later. Males and females also give a single hoot when near the nest. (Owlpages.com).

Breeding: The Great Gray Owl nests primarily in stick nests made by hawks, ravens, or crows, or in the hollowed out top of large-diameter snags. Nests are usually in a forest, but with a large clearing or meadow located within 0.8 miles. Great Gray Owls are semi-nomadic, with irregular site or mate fidelity between years. They tend to settle and nest in areas with high food resources and this may lead them to occupy the same nest for several years or move off to new areas. Nesting territories are defended from other Great Gray Owls, but foraging areas are widely overlapping. This leads to higher than expected densities for a large bird of prey. In areas of good habitat this may be as high as 5 pairs/square mile (Owlpages.com).

Habitat: Great gray Owls inhabit a range of forested habitats. Nesting habitat usually includes copses or islands of aspens within pure stands of conifers. Most foraging is done in open areas such as swamps, bogs, and forest clearings where there are scattered trees and shrubs that can be used as perches. (Owlpages.com).

Distribution: Great Gray Owls are found from Alaska across Canada, down the northern Rocky Mountains, and northern Minnesota (Figure A-11; Owlpages.com).

Probability of occurrence in Grand Portage National Monument: Open areas suitable for foraging are absent from the Monument but exist on adjacent Reservation lands. This is particularly true of the lands on either side of the trail corridor west of Old Hwy 61. Timber sales in this area are often up to 200 acres to simultaneously manage for moose habitat. This section of the trail corridor also has numerous mature white pines which may provide desirable nesting sites.

Reported sightings: Great Gray Owls have been occasionally observed on Reservation lands over the last decade (Novitsky, pers. comm.). Tentative identification of a Great Gray Owl along the Grand Portage trail was made by NPS resource management staff in 2002. This was strengthened by a nest call detected in the same area during the annual breeding bird survey later that spring. Abundant photographic evidence of Great Gray Owls within the Reservation was obtained during the irruption of northern owls in the fall and early winter of 2004. This species is probably a regular winter migrant and occasional nester on Reservation, and perhaps even Monument, lands. But it likely does so in backcountry areas not readily accessible for observations.

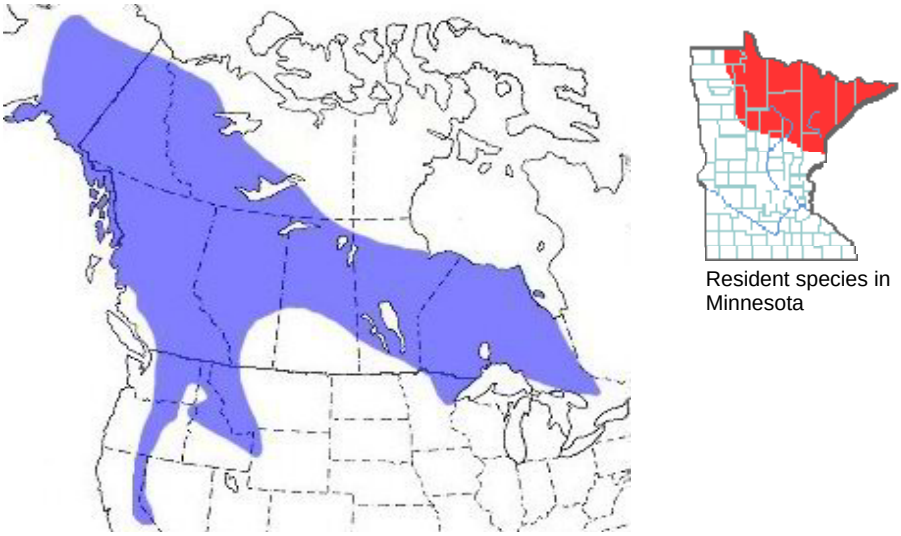

Figure A-11. Distribution of Great Gray Owls in North America and Minnesota (Owling.com; Minnesota Ornithological Union 2005).

Boreal Owl, *Aegolius funereus*

Voice: The most common call is the territorial song of the male, which varies widely from individual to individual. It is a series of "Poop" notes followed by a 3-4 second break, then another series. The individual variation is in the number of notes and the pitch and speed at which the notes are uttered. When the female approaches the singing male, the notes become more "stuttering." This usually leads into a trill of up to 350 rapid notes, which is sung from potential nest sites to show the female. The female's call is infrequently heard and similar to the male's, but fainter, higher pitched and not as clear (Owlpages.com).

Breeding: Boreal Owls nest mainly in old woodpecker cavities, but may use natural cavities. Males begin searching for nest holes in late winter. Prey items are often deposited into the hole, after which the male will sing from a perch. If an interested female approaches, the male flies to the cavity and utters a stuttering or trilling song. The female may then inspect the nest hole, and if she accepts it, will stay (Owlpages.com).

Habitat: Preferred habitat varies throughout its range but includes mainly old-growth forests with woodpecker cavities for nesting. They inhabit a range of forests from pure coniferous to pure deciduous forests. Hunting habitat includes forest meadows and open forests. When roosting they need dense conifers where they roost 16 to 20 feet up (Owlpages.com). In northeast Minnesota, the key habitat components appear to be cavities in old (>60 yr) poplar trees near extensive (300 acre) spruce bogs, which are used for thermoregulation during all seasons (Bill Lane, pers. comm.).

Distribution: Roughly follows the northern forest belt in North America. To the south, the distribution is generally confined to the forest areas of the Rocky Mountains (Figure A-12; Owlpages.com).

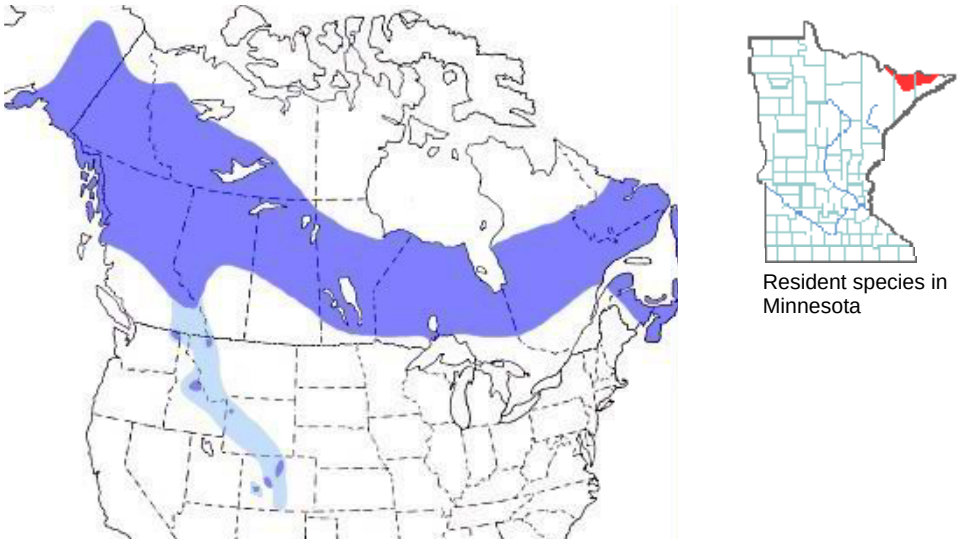

Figure A-12. Distribution of Boreal Owls in North America and Minnesota. Probable breeding range in lighter shade (Owling.com; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Old growth birch-aspen-spruce fir forests are the primary habitat in the Monument where abundant woodpeckers, including the Pileated Woodpecker, provide potential nest cavities. However, the presence of Boreal Owls in the Monument is unlikely because boggy spruce stands preferred for roosting are absent in the immediate vicinity, and due to the general decline of this owl species in the area.

Reported sightings: Tentative identifications of this species in 2002 and 2003 should be followed up with further monitoring. The possible confusion between the call of this species and Wilson's snipe flight sounds requires an individual with extensive knowledge of both and excellent discrimination skills. At this time, the presence of Boreal Owls within the Monument remains unconfirmed.

Northern Saw-whet Owl, *Aegolius acadicus*

Voice: The Northern Saw-whet Owl vocalizes during the breeding season only, usually between March and May. They are silent at other times of the year. The primary courtship call is a monotonous, whistled "hoop," emitted at about 1½ notes per second which may last for several hours without a break. Territorial calls are series of short clear notes. The Saw-whet Owl's name comes from the "skiew" call that is made when alarmed (Owlpages.com).

Breeding: Because of their nomadic nature, it is unlikely that pair bonds are permanent or that birds often return to the same nest site. Northern Saw-whet Owls nest in old woodpecker cavities, (primarily those made by Pileated Woodpeckers or Northern Flickers) or in natural cavities (Owlpages.com).

Habitat: These owls inhabit coniferous and deciduous forests with thickets of second-growth or shrubs, where woodpeckers create cavities in deciduous trees for nest sites. Breeding habitat is usually swampy or wet, rather than dry. Riparian habitat is often preferred (Owlpages.com).

Distribution: Breeds from southeastern Alaska to Nova Scotia, irregularly southward. They winter generally throughout much of the breeding range, but part of the population migrates south regularly to the central United States and areas along the Gulf coast. The Northern Saw-whet Owl is highly migratory in northern and eastern areas. Juveniles are more likely to migrate than adults and tend to move further south (Figure A-13; Owlpages.com).

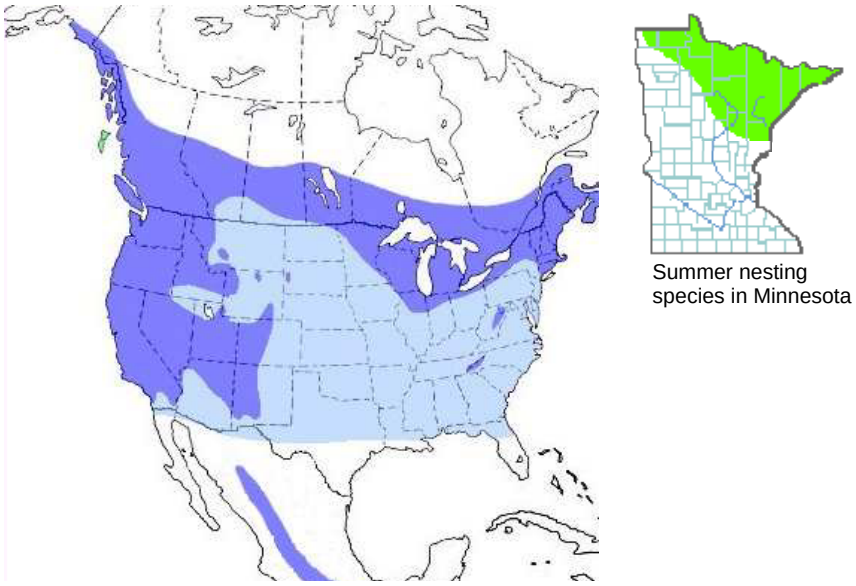

Figure A-13. Distribution of the Northern Saw-whet Owl in North America and Minnesota. Wintering areas in lighter shade (Owling.com; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Moist woods of mixed hardwood-conifer trees in and around Monument lands provide an abundance of suitable habitats for Northern Saw-whet Owls. They have been regular nesters in this area although numbers appear to be declining in recent years (Bill Lane, pers. comm.).

Reported sightings: Calling males are routinely heard near the Village of Grand Portage and Monument lands by local residents. Twelve (or possibly 14) individuals were recorded over the three years of the night-calling bird survey and were widely distributed across sampled areas of the Reservation and Monument. Recent night-time surveys by NPS resource staff detected Northern Saw-whet Owls in additional areas of the Reservation. Numbers apparently declined in 2005, and the future status of this species should be monitored.

Northern Hawk Owl, *Surnia ulula*
Voice: Call is a series of ringing whistles. It is similar to the Boreal Owl call, except it is higher, sharper, and longer (Owling.com). Call of male is a rolling whistled "ulululululul," lasting up to 14 seconds. Female has a similar but shorter and hoarser call. Alarm call is rapid, high, "kip-kip-kip-kip" (Cornell Lab of Ornithology 2004).

Breeding: Northern Hawk Owls nest in enlarged woodpecker holes, tops or hollows of tree stumps, and even occasionally in old nests of raptors or crows (Owling.com).

Habitat: The Northern Hawk Owl inhabits open forests usually with easy access to clearings. It may be found at the edge of a burn or open areas cleared by lumbering. It avoids dense coniferous forests and prefers sparse woodlands including birch, aspen, and mixed woods with some preference for pines. Also favored are areas with broken topped stumps or bare tree branches available that might be used for lookout perches (Owling.com).

Distribution: The Northern Hawk Owl is quite dispersed, moves freely through the northern coniferous forests, is essentially nomadic, and quite irruptive depending on weather conditions and prey availability. During years of normal rodent densities the Northern Hawk Owl winters in the far north. When vole numbers crash, usually every 3 to 5 years, irruptions occur and many birds disperse southward. The majority of the birds involved in these southward irruptions, potentially 90 percent, are juveniles. Surprisingly though, normal seasonal movements are most pronounced in adult females (Figure A-14; Owling.com).

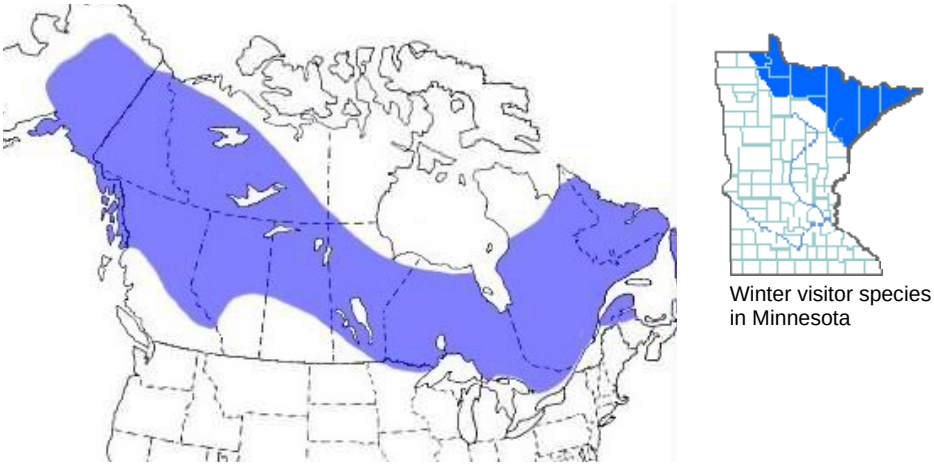

Figure A-14. Distribution of Northern Hawk Owls reported in North America and Minnesota (Owling.com; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Individual Northern Hawk Owls are infrequently reported from northern Minnesota, with increased numbers observed during irruptions that occur once or twice a decade (Janssen, 1987). Even during such times there is limited likelihood of hawk owls using Monument lands, with the possible exception of the beaver meadow area. The closed forest cover of the park unit does not provide habitat preferred

by Northern Hawk Owls, although areas near timber harvest sites on Reservation lands may provide suitable conditions.

Reported sightings: The preference for open areas with occasional snags was evidenced by a pair of Northern Hawk Owls that nested along the Gunflint Corridor during early 2000 in an area severely impacted by the 1999 "blowdown." This was a rare nesting record for Cook County. Northern Hawk Owls were among the species that contributed to the unprecedented northern owl irruption of fall 2004 in the Upper Midwest. Although high numbers were reported elsewhere in Minnesota, and as close as Lake County, no reports originated from the Grand Portage area. This species has not been verified within Monument lands, but should be considered as a potential winter migrant.

Long-eared Owl, *Asio otus*

Voice: The main advertisement call of the male is a low "hoo, hoo, hoo, hoo, ...", repeated 10 to 200 times, with one note every 2 to 3 seconds. The female responds with a raspy buzz call and often duets with the male. Calling occurs almost always during nocturnal hours (Owlpages.com).

Breeding: Males occupy nesting territories first and may begin their territorial calling in winter. Nesting occurs mainly from mid-March through May in North America. Long-eared Owls nest almost exclusively in old stick nests of crows, ravens, hawks, or herons. They nest rarely in rock crevices, tree cavities, or on open ground. Nests are almost always located in wooded sites, often screened by shrubbery, vines, or branches and are commonly 16 to 33 feet above ground. Densities of breeding birds are relatively low, except when local food and nesting habitat availability allow loosely colonial nesting (Owlpages.com).

Habitat: Long-eared Owls inhabit open woodlands, forest edges, riparian strips along rivers, hedgerows, juniper thickets, woodlots, and wooded ravines and gullies. Breeding habitat must include thickly wooded areas for nesting and roosting with nearby open spaces for hunting. During winter, they need dense conifer groves or brushy thickets to roost in (Owlpage.com).

Distribution: Long-eared Owls are widely distributed in North America (Figure A-15).

Probability of occurrence in Grand Portage National Monument: Long-eared Owls are rare, but regular, migrants, winter and summer residents in northeastern Minnesota (Janssen, 1987). Suitable nesting and foraging habitat for Long-eared Owls may exist in the lakeshore area of the Monument and near recently logged areas of the Reservation.

Reported sightings: There are no confirmed observations of Long-eared Owls in the Grand Portage area, although they are occasionally reported elsewhere in Cook County. This species should be watched for near Monument lands, but detecting their presence remains an act of chance.

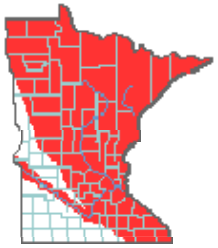

Figure A-15. Distribution of Long-eared Owls in North America and Minnesota (Owling.com; Minnesota Ornithological Union 2005).

Short-eared Owl, *Asio flammeus*

Voice: Short-eared Owls are generally quiet, owing to their diurnal nature and the wide open habitats where visual displays are more effective than in forests. The male's territorial song is a pulsing "voo-hoo-hoo", resembling an old steam engine. This song is given mainly during flight displays and the female responds with a barking "kee-ow" (Owlpages.com).

Breeding: The Short-eared Owl nests on the ground, unlike most other owls. Nests are usually situated in the shelter of a grass mound, under a grass tuft, or among herbaceous ground cover. The Short-eared Owl is highly migratory, and nomadic, except in southern parts of its range. This owl has relatively small nesting territories and home ranges, varying from 35 to 500 acres, and may nest in loose colonies in excellent habitat. Resident owls will defend winter foraging territories of about 15 acres, before expanding the territory size during the breeding season (Owlpages.com).

Habitat: Short-eared Owls inhabit wide-open spaces such as grasslands, prairie, agricultural fields, salt marshes, estuaries, mountain meadows, and alpine and Arctic tundra (Owlpages.com).

Distribution: Short-eared Owls occur widely in the Old World, in Iceland, the Hawaiian Islands, Galapagos Islands, and North and South America (Figure A-16).

Probability of occurrence in Grand Portage National Monument: Short-eared Owls are occasionally reported from the Duluth area, particularly from open habitats around the harbor and airport. In the Arrowhead region, they are rare migrants or vagrants (Janssen, 1987). Lack of appropriate habitat for foraging limits the probability of sighting a Short-eared Owl in the Grand Portage area, but the extremely unlikely occurrence of a rare vagrant should not be forgotten.

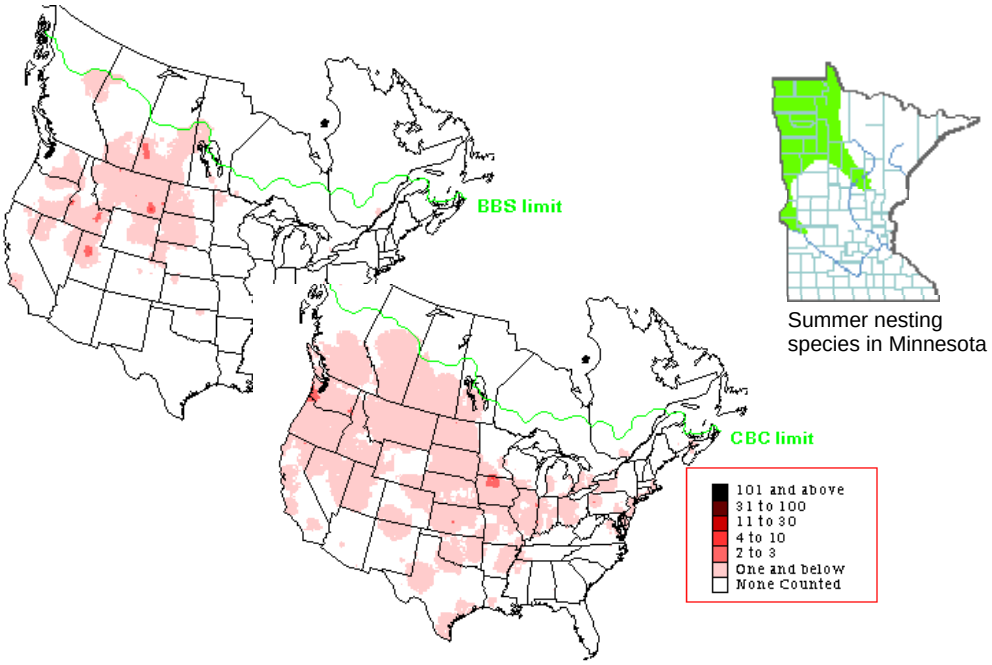

Figure A-16. Distribution of Short-eared Owls in North America and Minnesota, as reported from breeding bird surveys, Christmas bird counts, and state nesting records (Gough et al. 1998; Minnesota Ornithological Union 2005).

Reported sightings: An unusually high number of migrate Short-eared Owls were reported throughout northeast Minnesota during fall 2004, including an individual observed by NPS resource staff about three miles west of the Grand Portage Reservation on 6 October 2004. With an observation so near Monument lands, the potential exists for a rare migrant to use the meadow and lawn areas near the lakeshore.

Snowy Owl, *Nyctea scandiaca*

Voice: The Snowy Owl is virtually silent during nonbreeding seasons. The typical call of the male is a loud, harsh, grating bark, while the female has a similar higher pitched call. During the breeding season males have a loud, booming "hoo, hoo" given as a territorial advertisement or mating call. Females rarely hoot. Its attack call is a guttural "krufff-guh-guh-guk" (Owlpages.com).

Breeding: The Snowy Owl nests almost exclusively on the ground, where the female makes a shallow scrape with her talons on top of an elevated rise, mound, or boulder (Owlpages.com).

Habitat: The Snowy Owl is a bird of Arctic tundra or open grasslands and fields. They rarely venture into forested areas. During southward movements they appear along lakeshores, marine coastlines, marshes, and even roost on buildings in cities and towns (Owlpages.com).

Distribution: Circumpolar - Arctic regions of the old and new worlds. The Snowy Owl is highly nomadic. During periods of lemming and vole population crashes in the Arctic, or excessive cold and snow in winter, mass movements of Snowy Owls occur into southern Canada and northern United States. These invasions occur every 3 to 5 years, but are highly irregular. Adult females stay furthest north while immature males move furthest south during these incursions (Figure A-17; Owlpages.com).

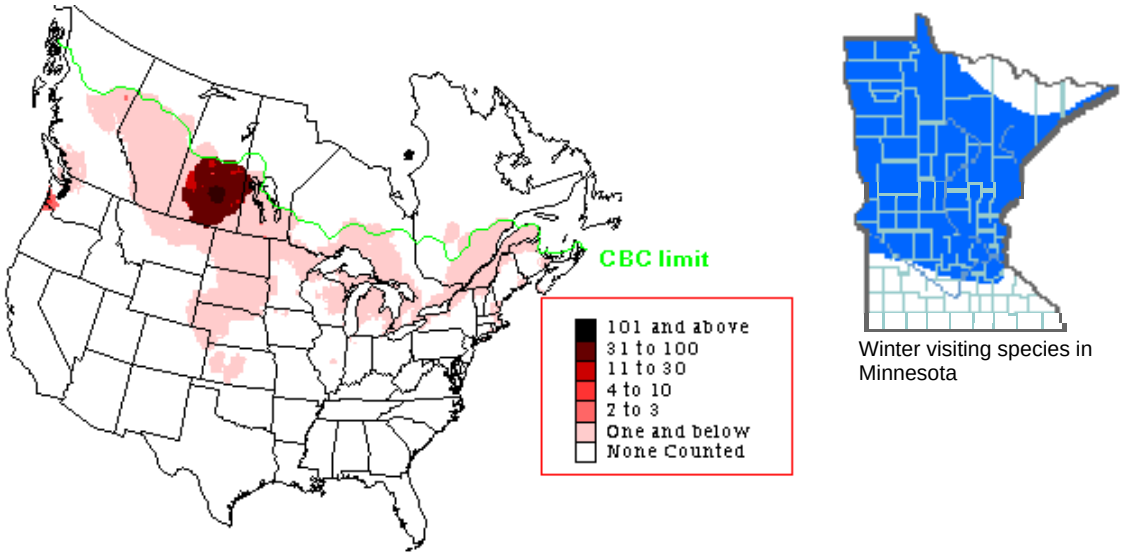

Figure A-17. Distribution of Snowy Owls in North America and Minnesota, as reported on Christmas bird counts and state records (Gough et al. 1998; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Snowy Owls are regular early winter vagrants along the North Shore as far south as Duluth. Individuals are seen nearly ever year at Monument Headquarters in Grand Marais. It is probable that Snowy Owls also pass through or use Monument lands during early winter wanderings, especially the open areas along the lakeshore. Documenting such occurrences arises from chance observations during the brief presence of these birds.

Reported sightings: Conversations with a long-term NPS seasonal staff member revealed that individual Snowy Owls were observed for several years in early fall, but some years ago. Reportedly a photo exists to verify these observations. While still closing the interpretive site for the winter, park staff would notice an owl perched on the stockade wall, ostensibly to hunt Canada geese that loafed within the protected stockade. This conjecture was supported by once finding an owl feeding on a goose which it had dragged under the porch of the Great Hall.

Whip-poor-will, *Caprimulgus vociferus*
Voice/Display: Eastern Whip-poor-will are known for their emphatic "WHIP-poor-WEEA," with the accent on the first and third syllables and a tremolo in the second. An elaborate courtship display leads to mating. A female may alight near a calling male, who then walks toward her with an undulating gait, head raised with each step and then lowered. Reaching her, he circles as she bobs, one or both birds calling continuously. Or he may approach her from alternating sides, touching her bill as she trembles. The call note is a short, quiet "quirt." Adults clap their wings to defend territory (Cornell Lab of Ornithology 2002).

Habitat: Whip-poor-wills are found in deciduous or mixed forests with little or no underbrush, and open woodlands with well-spaced trees and low canopy (Cornell Lab of Ornithology 2002).

Distribution: They breed locally from central Canada eastward to Atlantic coast and southward to Oklahoma and Georgia (Figure A-18; Cornell Lab of Ornithology 2002).

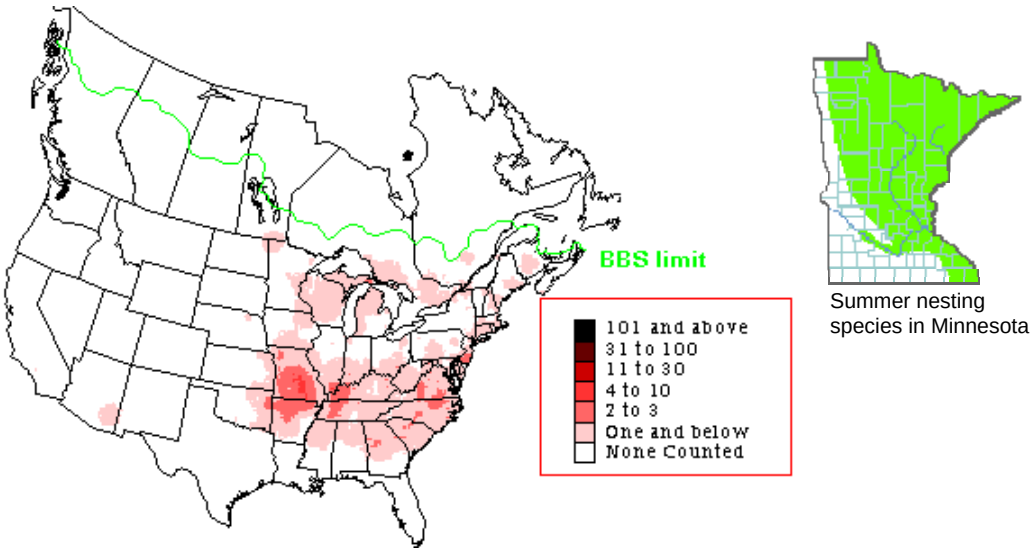

Figure A-18. Distribution of Whip-poor-will in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Due to suppression of forest fires during the last century, balsam fir now dominates the understory of local forests. The closed woodlands that result are not amenable to use by Whip-poor-wills. In addition to requiring open woodlands, there may be other factors that influence habitat choice along the North Shore. It has been suggested that elevation and distance from Lake Superior play a role (Benson, pers. comm.). Considering these factors, it appears that habitat suitable for Whip-poor-wills may be declining within the Reservation, and probably none is found within Monument property.

Reported sightings: Although apparently once common near the Village of Grand Portage, Whip-poor-will have not been reported in recent years. A former seasonal ranger reported hearing the distinctive call along the trail corridor on one occasion in the past, but details of her observation are lacking.

Common Nighthawk, *Chordeiles minor*

Voice/Display: Common Nighthawk males perform spectacular aerial displays over nest sites. They begin by circling high above a nest site while giving distinctive loud nasal "peent" calls, followed by a sudden steep dive toward a sitting female with wings held in a stiff "V." At the bottom of the dive, the wings are brought forward and air rushing through the primaries produces a booming "whoosh," much like the sound created by blowing across a bottle opening. Flight is then resumed. During courtship, males alight near females, making growling sounds and croaking notes while puffing out the white throat patch and fanning the tail. Males continue display flights throughout the breeding season, defending their territories both against other nighthawks and intruders (Cornell Lab of Ornithology 2002).

Habitat: Nighthawks are ground-nesters that normally breed in clearings, prairies, burned areas, cultivated fields, rocky outcrops, and other open or semi-open habitats (Cornell Lab of Ornithology 2002).

Distribution: Common Nighthawks breed from the Yukon to Labrador, southward to southern California, Florida, and South America (Figure A-2; Cornell Lab of Ornithology 2002).

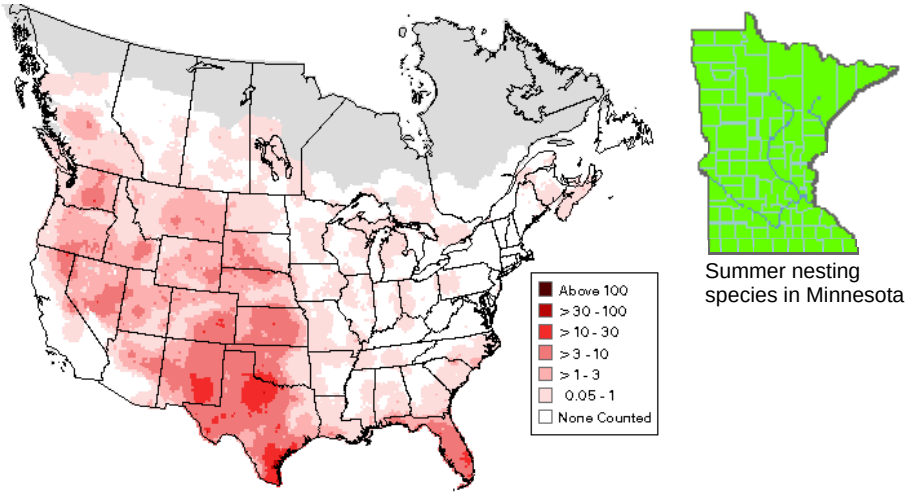

Figure A-2. Distribution of Common Nighthawk in North America and Minnesota, as reported from national breeding bird surveys and state records (Sauer et al. 2004; Minnesota Ornithological Union 2005).

Probability of occurrence in Grand Portage National Monument: Open areas lacking vegetative cover or with low cover, and which are also relatively free of disturbance are not common

around the Village of Grand Portage or the Monument. Formerly, burned or, more recently, logged lands may have provided suitable conditions in backcountry areas of the Reservation. During the last couple of decades, a few flat-topped buildings have been constructed on the Reservation, and these may provide the best nesting conditions for Common Nighthawks in the local area. Given the wide distribution of this species, it is likely that migrating groups may be seen in most years. Resident Common Nighthawks may be less frequently encountered.

Reported sightings: Common Nighthawk was documented during the night-calling bird survey on 24 May 2002 and 16 June 2003 by NPS staff. Casual observations had been previously made by staff but sufficient details are lacking for complete documentation of these earlier sightings.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS D-69, November 2008

National Park Service
U.S. Department of the Interior

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