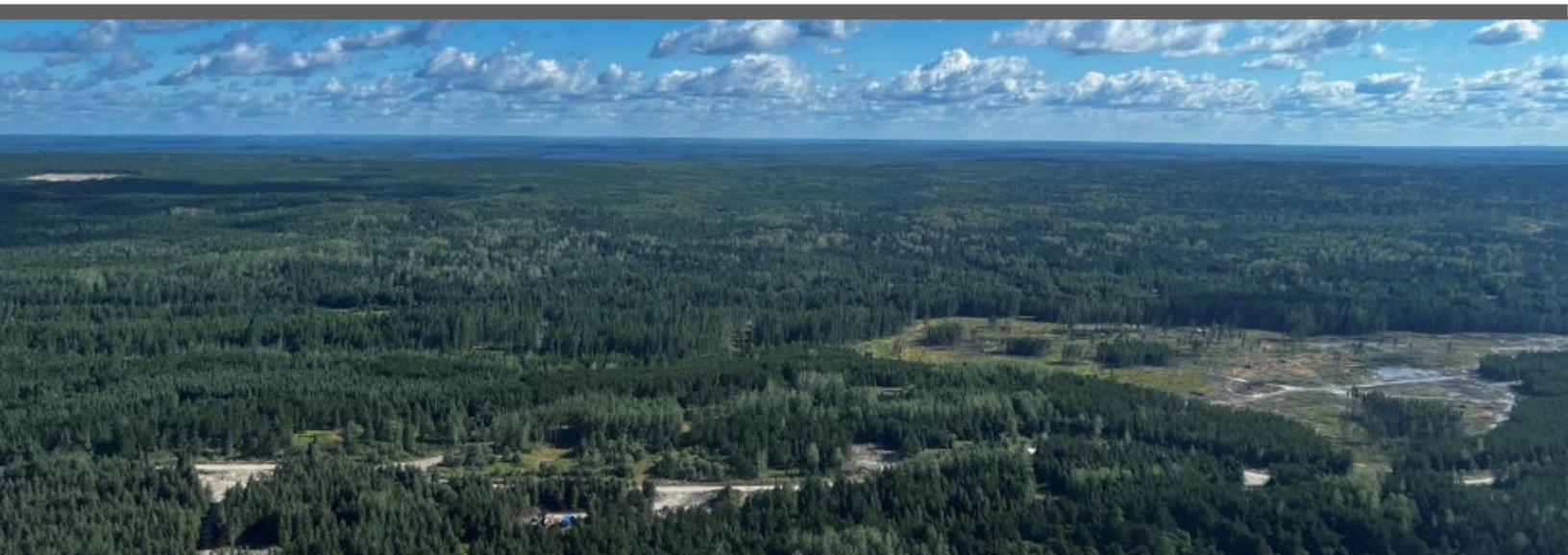
KINROSS Great Bear

Great Bear Gold Project
Impact Statement

Appendix M-1:

Terrestrial Baseline Environment Report



Great Bear Project

Terrestrial Baseline Environment Report

Updated May 25, 2025

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EXECUTIVE SUMMARY

This report summarizes information on species provincially listed as Threatened or Endangered potentially occurring near Great Bear Resources (GBR) proposed advanced exploration project (the Project) based on background information review and 2021-2023. Approximately of 381 person-days of fieldwork has been conducted on 110 calendar days from October 2021 through October 2023 by Northern Bioscience personnel in the GBR area of investigation (AOI). Vegetation mapping was based on forest resource inventory ecosites, with field confirmation. Survey effort for SAR mammals have included three winter aerial surveys, over 9000 unit-nights of trail camera monitoring (including two baited run poles), in-person surveys (237 stations) and 1600+ deployment-nights of autonomous recording unit (ARUs), potential bat roost surveys, and incidental observations. SAR bird assessment focussed on 1092 morning point counts, 57 owl survey stations, 237 nocturnal survey stations for nightjars/marsh birds, and 3600+ ARU deployment-nights for nocturnal birds, as well as 40+ waterfowl surveys on Teardrop and Rice lakes and other waterbodies. Acoustic monitoring for amphibians was conducted in tandem with bird/bat surveys, with targeted and opportunistic surveys for reptiles, particularly turtles. Surveys for insect species at risk were conducted in conjunction with other fieldwork.

Findings of note include:

- Vegetation in the AOI is typically boreal and dominated by upland conifer and deciduous forest and lowland conifer forest and reflect relatively recent disturbance by wildfire and ongoing forest harvesting.
- Endangered black ash is present near Rice Lake and several other locations; provincially rare floating marsh marigold (S2) is found along at least several ditches and streams in the AOI and Hooker's orchid (S3) was observed east of Tote Road at two locations.
- A provincially significant wetland is centred on WB01 (Teardrop Lake); the Rice Lake Wetland, centred on WB06 was also formally evaluated but is not provincially significant, although like WB01 likely supports provincially significant waterfowl staging habitat.
- The AOI has formerly supported Threatened woodland caribou but has no evidence of current use.
- Wolverines use the AOI at least occasionally, but it is not known if individuals of this Threatened species are resident.
- Endangered little brown myotis, tri-coloured bat, silver-haired bat, hoary bat, eastern red bats, and possibly northern myotis use the AOI, at least for foraging. No evidence of roosting or hibernacula has been found.
- There are two active colonies of Threatened bank swallow in aggregate pits along Tuzyk's road.
- Special Concern (SC) whip-poor-will use at least the northwest corner of the AOI and north of Genessee Lake but have not been detected elsewhere despite repeated surveys.
- Other SC bird species confirmed in the AOI during breeding season include Canada warbler, common nighthawk, eastern wood-pewee, evening grosbeak, olive-sided flycatcher, and rusty blackbird. Likely SC migrants include yellow rail and short-eared owl.

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1 INTRODUCTION

Kinross Gold acquired Great Bear Resources Ltd., and its Great Bear Project located approximately 25 km southeast of the community of Red Lake, Ontario in 2022 (Figure 1). The Project is currently in the early mineral exploration stage, with plans to undertake advanced exploration in the near future and eventually entering commercial production of a high-grade open-pit gold mine at the Project's LP Fault Zone, a zone of important mineralization, before transitioning at some point to a higher-grade underground operation. Northern Bioscience has been retained by the proponent to conduct baseline terrestrial assessment of the Project to support eventual permitting and an environmental assessment.

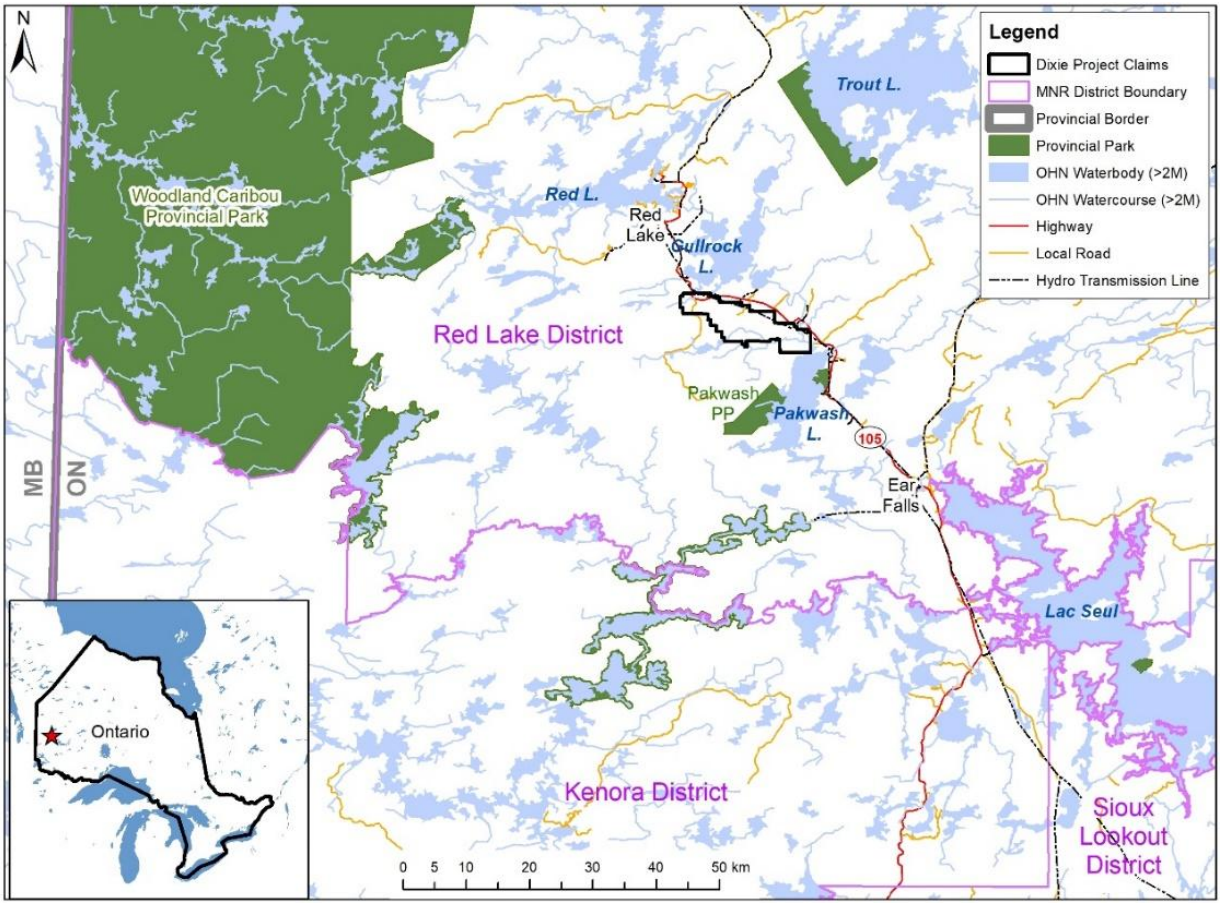


Figure 1. General location of Great Bear Resources' Great Bear Project.

1.1 Project Location and Setting

This Project property encompasses approximately 91 km^2 with its geographic centre at approximately 48° 47' N latitude, 86° 19' W longitude (UTM NAD83 N15 Easting 456845 and Northing 5634690). The bulk of the property is bounded on the west by Dixie Road North, footprint of The Project property is roughly bounded by the Highway 105 to the north, Dixie Creek to the south, the Chukuni River to the east, and Stone River to the west. Access to the main exploration area in the centre of the property is gained through Tuzyk's Road; access to the western portion of the property is off Dixie Road (North) and the eastern portion via Dixie Road, also known locally as Tote Road.

The Project is proposed within an area characterized by relatively dense vegetation, comprised largely of upland forest and conifer swamp. The terrain is low to moderate with an east-west trending bedrock ridge in the northern portion of the property. There are a number of waterbodies on the property, the largest which is 222 ha Rice Lake. Much of the property drains via small watercourses to Dixie Creek and into the Chukuni River, and ultimately west and north to Hudson's Bay. The climate of this area is typical of northern areas within the Canadian Shield, with long winters and short, warm summers.

The Project is proposed on Crown Land, with GBR holding surface and mineral rights for the area. Regional land-use activities in the area include hunting, fishing, trapping, and snowmobiling, as well as mineral exploration (and mining) and forestry. Other localized land uses in the area include several licensed aggregate pits. The primary industries in the area have historically been forestry, pulp and paper, mining, and tourism.

Several First Nation and Métis groups were originally identified as having a potential interest in the Project based on Treaty Rights, asserted traditional territory and proximity to the Project. Traditional uses which they have identified as occurring in the area include hunting, trapping, fishing and plant harvesting, with activities generally focused along the larger waterways and lakes.

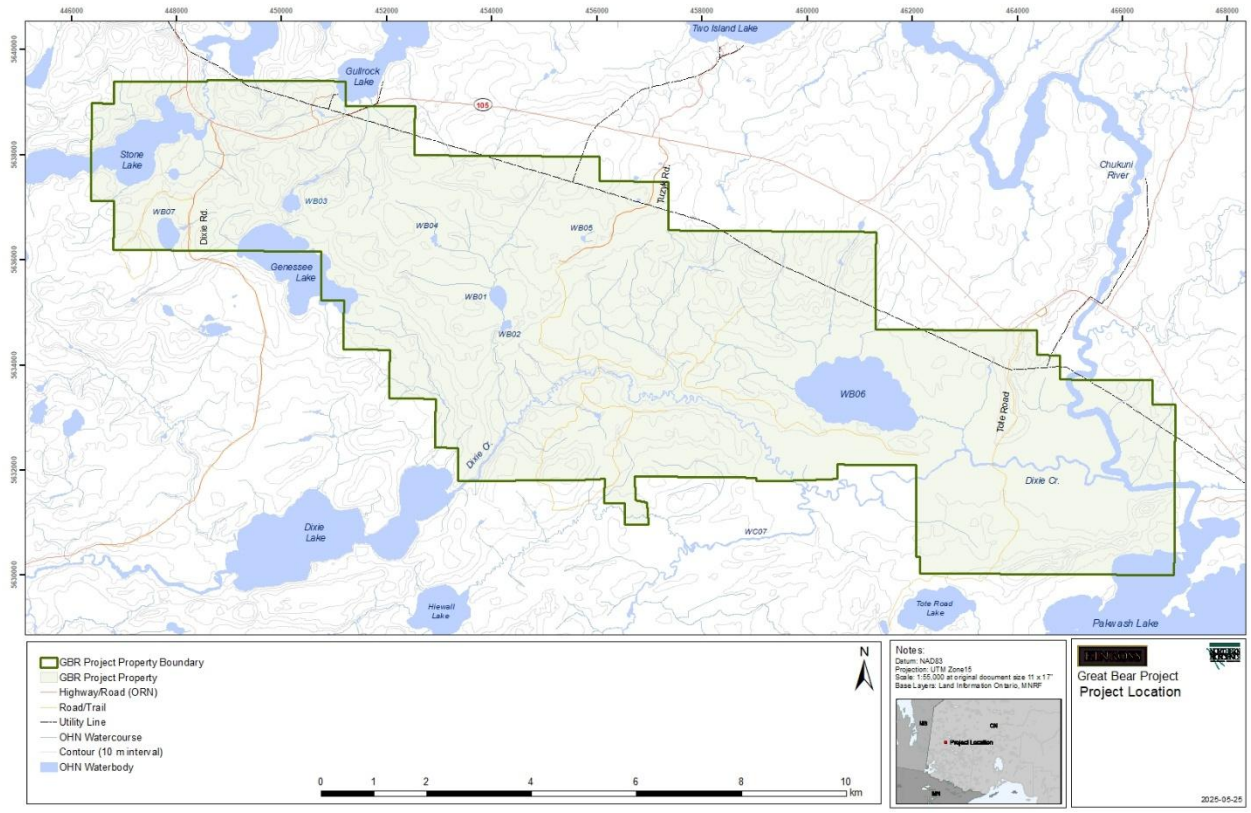


Figure 2. Great Bear Project location.

1.2 Study Objectives and Scope

This report presents the preliminary results of studies characterizing vegetation and wildlife, including species at risk (SAR) in the GBR Area of Interest (AOI). The scope of the vegetation and wildlife baseline study includes the terrestrial environment, wetlands, and aquatic habitats where relevant e.g., semi-aquatic mammals such as beaver and muskrat. Fish and fish habitat is outside the scope of this report.

The AOI for this baseline report is primary the Great Bear Project property and adjacent lands. Selected fieldwork was also conducted along the transmission line corridor south to Ear Falls and north along the Highway 107 corridor north to Red Lake.

2 REGULATORY SETTING

2.1.1 Federal

2.1.1.1 Species at Risk Act (SARA)

The SARA includes prohibitions against killing, harming, harassing, capturing, or taking individuals of species listed as Threatened, Endangered, or Extirpated on Schedule 1 of the Act, or damaging or destroying their residences. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts, assesses each species according to a broad range of scientific data and recommends their appropriate status (e.g., Extirpated, Endangered, Threatened, Special Concern, Not at Risk, Data Deficient) to the federal minister. After any necessary consultation with affected stakeholders or other groups, the federal Cabinet then decides whether those species should get legal protection under the SARA; not all species recommended as SAR by COSEWIC end up being listed on Schedule 1.

Federal Recovery Strategies (RS) are developed for species designated as Extirpated, Endangered, or Threatened under Schedule 1 of SARA, and include the identification of Critical Habitat. Management plans are developed for species designated federally as Special Concern. Recovery strategies have been finalized for most of the Threatened or Endangered species that may be present at the Project (e.g., woodland caribou, little brown myotis, Canada warbler, olive-sided flycatcher), although critical habitat has not yet been identified for all. Management plans have been prepared by Environment Canada for most Special Concern species that may use the Project AOI such as monarch and common nighthawk, but not others e.g., eastern wood-pewee.

The SARA is administered throughout Canada by Environment and Climate Change Canada (ECCC; formerly Environment Canada [EC]) and typically applies only to federally administered lands, however recommendations by the federal minister can be made under Section 61 of the SARA if critical habitat of a species is not being adequately protected by provincial legislation (Government of Canada 2020c).

2.1.1.2 Migratory Birds Convention Act (MBCA)

The MBCA (Section 6) prohibits the harming, killing, disturbance or destruction of migratory birds, nests, and eggs (Section 6) of migratory birds as defined in Article 1 of the Act. In general, birds not falling under federal jurisdiction within Canada include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbirds. (Government of Canada 2020). The MBCA (Section 5[1]) also prohibits depositing oil, oily waters, or other substances harmful to migratory birds in areas that they may inhabit.

2.1.2 Provincial

2.1.2.1 Endangered Species Act (ESA)

Ontario's ESA protects species that are listed as Threatened or Endangered on the Species at Risk in Ontario (SARO) List. The SARO list is developed by the Committee on the Status of Species at Risk in Ontario (COSSARO) based on the best available scientific information, community knowledge and Aboriginal traditional knowledge using a suite of criteria similar, but not identical, to those used by COSEWIC. Section 9(1)(a) of the ESA protects individuals of Threatened and Endangered (but not Special Concern) species from being killed, harmed, or harassed harm or harassment and Section 10(1) protects their habitats from being damaged or destroyed. Listed species (i.e., Threatened and Endangered) receive immediate general habitat protection for areas on which it depends, directly or indirectly, to carry out its life processes. Species-specific regulated habitat is supposed to be more precisely defined within 2-3 years and specific habitat features and geographic boundaries. Provincial recovery strategies for SARO-listed species are similarly supposed to be developed for Threatened and Endangered species within a prescribed time frame if federal recovery strategies are lacking; similarly, management plans are to be in place for Special Concern species. Where available, provincial recovery strategies or management plans have been considered in the development of appropriate mitigation measures to minimize impacts on listed species.

Under certain circumstances activities that are normally prohibited under the ESA (e.g., harming or harassing a SARO-listed species or damaging/destroying its habitat) may be allowed. An "Overall Benefit" (OB) permit may be issued under Section 17(2)(c) of the Act if through specific and mandatory conditions outlined in the permit will result in an overall benefit to the species within a reasonable time (Government of Ontario 2020). Issuance of an OB permit also requires that reasonable alternatives were considered, reasonable steps were taken to minimize adverse effects on the species, and effectiveness monitoring is conducted. The ESA was formerly administered the OMECP (and formerly by the OMNR) and protection under the ESA extends to both public and private lands in Ontario, including the Project site.

2.1.2.2 Fish and Wildlife Conservation Act

Ontario's Fish and Wildlife Conservation Act is administered by the OMNRF for planning, wildlife management, and wildlife enforcement. The Act provides protection for wildlife and wildlife residences, such as dens and nests (including those of species that are not protected under the MBCA e.g., raptors)

2.1.2.3 Provincial Policy Statement

The Provincial Policy Statement (PPS) (MMAH 2014) informs land use planning decisions under the Planning Act in Ontario, and in particular, Policy 2.1 of the PPS establishes a provincial interest in the protection of natural heritage features. While EAs are not subject to Planning Act approval, the policy guidance and practice developed to support the PPS provides a framework for assessing the functions and sensitivities of natural features. Guidance to help identify and evaluate natural heritage features is provided in the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement (OMNR 2010a) and the Significant Wildlife Habitat Technical Guide (OMNR 2000). Criteria Schedules have not yet been developed for Ecoregion 4S in which the Project is located, although they are in development; Ecoregion 3W Criteria Schedules (OMNRF 2017) will be used for rough guidance in the interim. This framework was considered in evaluating potential environmental effects and the identification of mitigation measures that will reduce or eliminate the environmental effect. The natural heritage features identified in the PPS that are considered in report include habitat of provincially significant wetlands (PSWs), significant wildlife habitat (SWH), and the habitat of Threatened and Endangered species.

3 METHODOLOGY

Terrestrial baseline efforts included collection and review of available background information and data, field studies, and eventually habitat modelling. Initial fieldwork by Northern Bioscience commenced in late 2021, expanded in 2022-2023, and reduced in intensity in 2024.

3.1 Desktop Review and Data Sources

A desktop review of available information was conducted for information on the presence or status of vegetation and wildlife in the AOI including:

- Atlas of the Breeding Birds of Manitoba (Artuso et al. 2018),
- Atlas of the Mammals of Ontario (Dobbyn 1994),
- BugGuide (www.bugguide.net),
- Bumble Bees of North America (Williams et al. 2014),
- Bumble Bee Watch (https://www.bumblebeewatch.org/f),
- Committee on the Status or Endangered Wildlife (COSEWIC) status reports
- eBird: An online database of bird distribution and abundance (https://ebird.org/home),
- eButterfly: a citizen-based butterfly database in the biological sciences. (http://www.e-butterfly.org/),
- Forest Management plans for the Red Lake Forest[1] (http://www.efmp.lrc.gov.on.ca/eFMP/home.do),
- iNaturalist (https://www.inaturalist.org/),
- Ontario Breeding Bird Atlas (Cadman et al. 2019),
- Ontario Butterfly Atlas (http://www.ontarioinsects.org/atlas_online.htm),
- Ontario Reptile and Amphibian Atlas (https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/),
- Natural Heritage Information Centre (https://www.ontario.ca/page/natural-heritage-information-centre),
- The Natural History of Canadian Mammals (Naughton 2012),
- NatureServe (https://www.natureserve.org/),
- Rare Vascular Plants of Ontario (Oldham and Brinker 2009), and
- Species at Risk in Ontario (SARO) List (https://www.ontario.ca/page/species-risk-ontario).

A review of available information was also conducted for any new survey protocols for SAR and other VEC's within the AOI, particularly for recently listed SAR. Recent draft Ecoregion Schedules for significant wildlife habitat, provincially significant wetlands, or other significant natural features under the Provincial Policy Statement (OMNRF 2017) were also reviewed.

In addition, the following were reviewed to assist in assessing vegetation, wildlife, and habitat in the Project area and developing appropriate mitigation:

- COSEWIC status reports or other relevant literature,
- provincial or federal recovery strategies,
- conservation plans,
- best management practices (BMPs),
- mitigation measures, or

[1] https://www.efmp.lrc.gov.on.ca/eFMP/home.do

- other relevant guidance documents.

Where appropriate, Indigenous Traditional Knowledge (ITK) of plants and animals was reviewed for consideration.

3.2 Field Surveys

A total of 381 person-days of fieldwork was conducted on 110 calendar days from October 2021 through October 2023 by Northern Bioscience personnel. Survey methods and effort for vegetation and wildlife generally followed standardized protocols where appropriate and are discussed below.

3.2.1 Vegetation Mapping

Vegetation mapping is based on Forest Resource Inventory (FRI) data for the Red Lake Forest supplemented with fieldwork, air photograph interpretation, and Northern Ontario Engineering Geology Terrain Study Maps (NOEGTS). Fieldwork in 2022-2023 focused on visiting representative vegetation types and communities and compiling notes on soils and vegetation to confirm and supplement FRI mapping. Mapped polygons in this FRI included the draft provincial ecosites (Banton et al. 2009). Fieldwork in 2022-2023 confirmed the accuracy of these new ecosite designations and polygon boundaries within the AOI. A total of 28 rapid assessment plots (RAPs) similar to Ontario Parks field protocols were completed in 2023 in addition to rapid field verification of ecosites during approximately 250 avian point counts (Appendix 1). RAPs included full ecosite verification including soil augering to 1 m depth and assessment of the following:

- Field soil texture
- C-Horizon texture
- Depth to mottles
- Moisture Regime
- Drainage Class
- Organic Layer Depth
- Depth to Bedrock
- Depth to Water

The percent cover of the four most dominant species, (as well as total cover, was recorded for each of the each of the following standard Ecological Land Classification (ELC) physiognomic strata:

- Trees >20m Super Canopy
- Trees >10m Upper Canopy
- Trees >10m Lower Canopy
- Trees or Shrubs 2-10m
- Trees or Shrubs 0.5-10m
- Trees or Shrubs <0.5m
- Herby, Graminoids, & Ferns
- Moss, Lichen, Liverwort
- Floating Aquatic
- Submergent Aquatic

The percent ground cover of the following were also estimated visually:

- Fine Woody Debris (<7.5 cm)
- Coarse Woody Debris (>7.5 cm)
- Bedrock
- Stones
- Mineral Soil
- Conifer Litter
- Broadleaf Litter
- Humus (F, H)
- Fruticose Lichens
- Foliose Lichens
- Crustose Lichens
- *Sphagnum*
- Feathermosses
- Other Mosses
- Water
- Other

In addition to keying out the boreal ecosite, the diameter breast height (cm) and height (m) or representative dominant trees were recorded, as were the presence and characteristics of any wildlife trees (e.g., roost/nest trees) (OMNR 2009).

Wetlands contiguous with Teardrop Lake (WB01), Rice Lake (WB04), and adjacent Dixie Creek were typed in 2022-2023 as per the Ontario Wetland Evaluation System Northern Manual (OMNR 2022), often in conjunction with other fieldwork. Supplemental 3D interpretation of FRI imagery of these wetlands was conducted by experienced photogrammetry interpreters (Sumac Geomatics Inc.) to further refine wetland polygon boundaries.

3.2.2 Wild Rice

Wild rice surveys were undertaken in 2021-2023 with increasing intensity. Preliminary mapping of wild rice in Rice Lake was conducted by delineating the outer boundary of rice stalks with GPS during a boat survey in October 2021. In 2022, there was very little rice on Rice Lake due to atypical flooding, and individual stems or clumps of rice were georeferenced.

3.2.2.1 Quadrat Sampling

Quadrat-based sampling was used to assess wild rice on Teardrop Lake (WB01) and Rice Lake (WB06) (Appendix 1). Fifteen 1 m x 1 m randomly-placed quadrats were conducted on August 22, 2022, using a floating quadrat frame (Figure 3). Each quadrat was georeferenced, and water depth measured using a metre stick. The numbers of wild rice stems were counted, and percent (%) cover of wild rice and other plant species estimated. Reference photos were also taken.

More typical water levels in 2023 allowed quadrat-based sampling to be expanded to Rice Lake as well, with A. Harris replacing R. Foster as the field lead. In 2023, 50 sample points were randomly chosen using ArcMap GIS within previously mapped rice stands for each of Rice Lake and Teardrop Lake. Five quadrats were also completed at random spacing distance in the channel draining from Teardrop Lake. As in 2022, at each point, a 1 m x 1 m floating quadrat frame was used to count wild rice stems and estimate percent cover. Only those stems rooted in the quadrat frame were counted. The height of a typical rice stem above the surface of the water was also measured at each point. The fieldwork was completed by canoe and small boat on September 6-7, 2023.

In 2023, the following physical habitat attributes were also measured:

- Water depth was measured using a graduated pole at each plot;
- Surface water pH, conductivity, and temperature were measured using a Hanna Combo meter at five points in each lake;
- Dissolved oxygen was measured in surface waters using a YSI 550A meter at five points in each lake; and
- Waypoints were recorded with a Garmin GPS.

Figure 3. Quadrat frame used for surveying wild rice in August-Sept 2022 (left) and 2023 (right).

3.2.2.2 Aerial & Boat Survey

An aerial survey was conducted in 2023 for wild rice in the Project area and surrounding landscape (Figure 4). These data will be used to provide local context, help assess the significance of any habitat loss, and potentially identify local opportunities for habitat compensation. The survey route was chosen using GoogleEarth and other aerial imagery to target suitable habitat including shallow, marshy lakes and ponds and slow-moving streams. the survey was completed on September 5, 2023. Flight speed was about 50 to 80 km/hour at an elevation of 30 to 50 m above ground level. Lakes and streams with suitable habitat and emergent vegetation were flown over at low speed and elevation to identify wild rice. Other lakes were flown over relatively quickly. In contrast to the clonal growth of *Schoenoplectus*, *Eleocharis,* and other common emergent species, wild rice was distinguished from other emergent vegetation by its non-clonal growth consisting of tillers arising from a single seed, and yellow-green colour.

In addition to boat surveys conducted concurrently with other fieldwork (e.g., turtle surveys, marsh bird monitoring, waterfowl surveys), a boat survey of Dixie Creek from the Chukuni River upstream to the Project site was conducted on September 27, 2023, to document occurrences of wild rice.

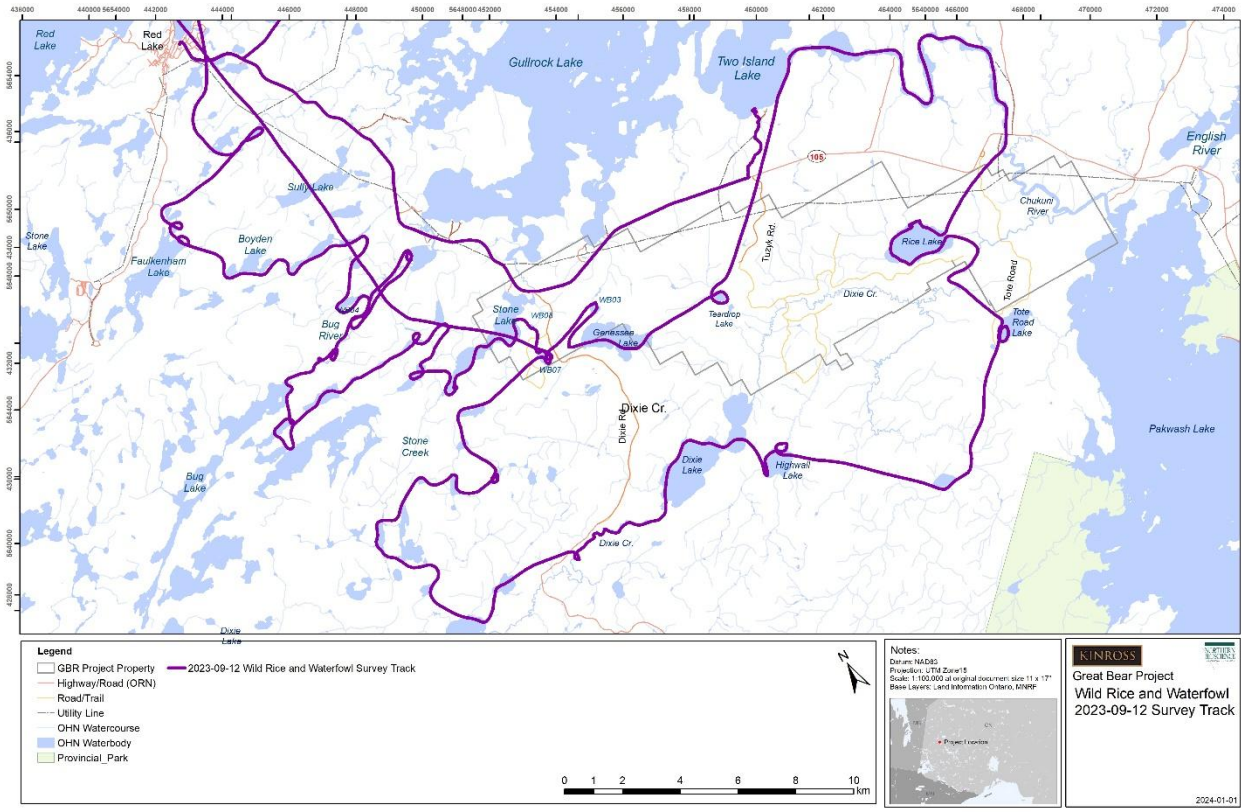


Figure 4. Wild rice aerial survey conducted on September 05, 2023.

3.2.3 Rare Plant Surveys

Rare plant survey effort focused on habitats within the AOI more likely to support provincially rare vascular plant species (NHIC 2020) using the controlled intuitive meander survey method (Alberta Native Plant Council 2000; BC MECCS 2018; Whitaker et al. 1998). Potential rare plant survey habitats can include cliffs, moist rock faces, talus slopes, seeps and springs, rocky floodplains, sand dunes, wetlands, and associated waterbodies. Particular effort was made to search for black ash (*Fraxinus nigra*), recently assessed as Threatened by COSEWIC (2018) in low-lying areas along and near waterbodies and watercourses.

Provincially rare species are those that are ranked as S1-S3 by OMRNF's Natural Heritage Information Centre (NHIC 2020). Subnational or S-ranks include the following:

> **SX — Presumed Extirpated.** Species or community is believed to be extirpated from the province or state.
>
> **SH — Possibly Extirpated (Historical).** Species or community occurred historically (i.e., >20 years ago) in the province or state, and there is some possibility that it may be rediscovered.
>
> **S1 — Critically Imperiled.** Critically imperilled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province or state.
>
> **S2 — Imperiled.** Imperiled in the province or state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province or state.

S3 — Vulnerable. Vulnerable in the province or state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 — Apparently Secure. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 — Secure. Common, widespread, and abundant in the state or province.

SNR — Unranked. Province or state conservation status not yet assessed.

SU — Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA — Not Applicable. A conservation status rank is not applicable because the species is not a suitable target for conservation activities e.g., non-native species.

A rank followed by "?" denotes some uncertainty by NHIC as to appropriateness of the rank based on known occurrences.

Fungi were documented opportunistically (with georeferenced photos) during other fieldwork in 2021-2023.

3.2.4 Mammals

3.2.4.1 Trail Cameras & Wolverine Run Poles

Trail cameras were initially deployed in October 2021 for monitoring of potential use of the AOI by mammals, with additional units deployed in 2022 and 2023. Over 60 trail cameras have been deployed at over 70 locations in the AOI (Figure 5) for more than 9000 unit-nights as of 2023-11-01 (Appendix 3). Cameras generally set along trails, rock barrens, riverbanks, and lakeshores in the Project AOI in order to detect caribou, wolverine, moose, white-tailed deer, and wolves as well as other mammals. A combination of Browning Dark Ops HD ProX, Spec Ops Elite HP4 and HP5, Strike Force HD ProX, and Recon Force HP5 models were used and were typically programmed to take a burst of 3 photos, with Sensitivity set to "High" and a delay of 60 seconds between bursts. Trail cameras are a recommended method for surveying wolverines Koen et al. (2008).

A baited run pole for wolverine was established south of Dixie Creek on November 25, 2021, with a 2nd established November 21, 2022, southwest of Teardrop Lake (Figure 5). Run poles are a non-invasive method of identifying individual wolverines by their unique chest marking (not visible in side-view on regular trail camera deployments). The run poles were similar to those used successfully for wolverine in the Red Lake area by Wildlife Conservation Society (Scrafford 2020) as well as other wolverine researchers e.g., (Aubry and Raley 2013; Magoun et al. 2008). The set-up consisted of a beaver bait hanging from airplane cable strung between two trees, with a supported run pole made from felled logs attached to tree at one end of the airplane cable (Figure 6). A Reconyx Hyperfire trail camera was positioned opposite the run pole to take photographs when a wolverine standing on the run pole reaches up to grab the suspended bait. At least one other trail camera was focused on the run pole to shoot video or photos of the set-up in case a wolverine approached the site but did not climb up on to the run-pole. The 1st run pole was checked throughout the winter of 2021-2022 and the ½ beaver carcass bait replaced as necessary. Both run poles were baited in November 2022 and were maintained through until April 2023.

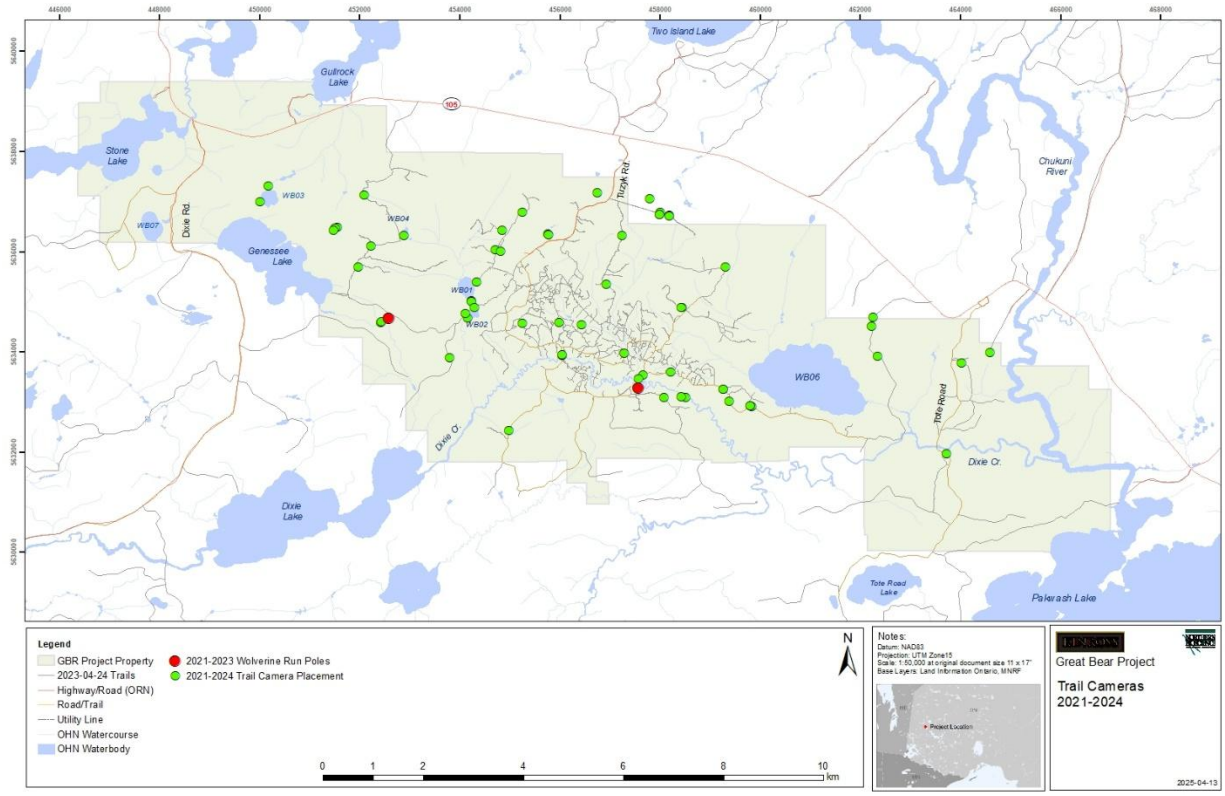


Figure 5. Location of trail camera deployments and wolverine run poles, 2021-2024.

Figure 6. Wolverine run poles established near Dixie Creek (left) and Teardrop Lake (right).

3.2.4.2 Aerial Survey

Three winter aerial surveys were conducted for the Project in 2022-2023 to assess distribution and abundance of large mammals at and near the Project. There are no provincial standards for wolverine surveys and the caribou survey protocol in OMNR's Selected Wildlife and Habitat Features Inventory Manual (Ranta 1998) is somewhat dated. Therefore, the survey approach adapted elements from OMNRF's moose aerial inventory (MAI) survey protocol (OMNR 2006; Oswald 1998) in order to collect moose data consistent with provincial moose plots, as well as surveying evidence of use by caribou and wolverine. Survey transects were based on a series of ten continuous 2.5 x 10 km MAI survey plots aligned along the east-west axis of the property (Figure 7). A total of 400 km of transects, not including circling and connecting lines linking transects, was flown for the February 2023 and 2023 surveys following this protocol. Transect lines were spaced 500 m apart to be consistent with MAI plots; it also increases the likelihood of detecting use of the AOI by boreal caribou and wolverine compared to the wider 2-km spacing recommended by Ranta (2012) for caribou. In addition, the existing transmission line ROW from the Project site south to Ear Falls was also flown during the 2022 survey during the to assess use of the potential electrical connection corridor and provide reconnaissance for future spring/summer

sampling. The third winter aerial survey was conducted in early April 2023 primarily to assess any activity at a potential wolverine den that had been identified during summer 2022 fieldwork as well as documenting stick nests. Details and survey tracks of the three winter aerial surveys are presented in Appendix 4 and Appendix 5. 2022-2023 winter aerial survey flight tracks for the GBR project.

Aerial surveys were conducted using a three-person team (+ pilot) to maximize detection of wildlife and their tracks consistent with methodology for other large mammal surveys (e.g., Oswald 1998; Ranta 1998). The two primary observers were seated in the rear of the aircraft, with the navigator/recorder/survey lead in the front. The survey lead and at least one of the primary observers had extensive experience conducting helicopter surveys for carnivores and large. The surveys were conducted using an A-Star helicopter (Forest Helicopters Ltd) staged from Red Lake. The pilots also had extensive experience large mammal surveys in northern Canada. Weather and snow conditions were good during the surveys. Total snow depth during the surveys was >40 cm, exceeding the minimum 30 cm recommended by Ranta (1998).

The surveys generally consisted of the following:

1. Flying along the transect at a cruising altitude of approximately 100 m AGL (325 ft) but varying depending on tail winds, ground speed, terrain, forest type / patterns, and snow and light conditions.
2. Cruising air speed was generally maintained at approximately 100 km/hour with higher speeds across large lakes.
3. The three surveyors and pilot reported observations of animals, and recent and older track activity where it could be identified.
4. When a caribou, wolverine, moose (*Alces alces*), or wolf (*Canis lupus*) or their respective fresh tracks was observed, the helicopter departed from the transect line and recorded the GPS location of where animals were first sighted for calculation of distance to the transect line. GPS waypoint # was recorded on the topographic maps printed for the survey. This allows for the inclusion of all observed animals in the density estimate, including those tracked.
5. The number of bulls, cows, calves, unknown adults, and unknown caribou (e.g., juveniles or adults) were recorded in each group. With sufficient sample size, this information can be used to determine the annual recruitment rate, demographic composition and group size.
6. Observed animals that were counted, aged, and sexed where possible (e.g., caribou and moose) were recorded on the survey maps using the following codes, followed by # individuals if more than one:
    a. CU = caribou, unknown sex (e.g., juveniles)
    b. CM = caribou, male
    c. CF = caribou, female
    d. CC = caribou, calf
    e. MU = moose, unknown sex
    f. MM = moose, male
    g. MF = moose, female
    h. MC = moose, calf
    i. G = wolverine (for *Gulo*)
    j. W = wolf
7. High resolution photographs were taken (with the window open if possible) for use as a general record of groups classified including:
    a. Animals, particularly caribou (to aid sex/age determination and # individuals) and wolverine,
    b. Selected wolverine tracks, and
    c. General habitat of caribou and wolverine observations only (can be used to qualify forest cover and snow/light conditions as a covariate).

8. Circling time on animals considered potential stress on the individuals, particularly with respect to snow depth and running distance (if any).
9. Once the animal observation was complete, the aircraft returned to the exact transect line departure point and resumed the transect.
10. If fresh caribou or suspected wolverine tracks were observed, they were followed to detect the responsible animal(s) if possible. Tracks were only followed as far as adjacent transects or until sign was lost. If an animal was sighted, then a waypoint, demographic information, photos were taken as above. The observation was circled on the survey map to denote the animal was found by following tracks rather than sighted from the survey line. The aircraft returned to the transect at the point of departure and continued survey along transect.
11. Only fresh caribou and suspected wolverine tracks were followed; fresh tracks of moose or wolf were not followed unless required to confirm species.
12. Stick nests were recorded and circled, where necessary, to determine current occupancy and or likely species use.
13. Tracks of other species and old tracks of all species were not followed, nor consistently recorded on maps. However, the species and age of tracks (e.g., old moose tracks, red fox tracks, marten tracks) were called out during the survey to help maintain alertness and screen out tracks that did not need to be followed, and to alert observers to watch for fresher tracks. These tracks were recorded on maps as time allowed, as were individuals of non-target animals (e.g., furbearers, sharp-tailed grouse). At the end of the survey, a summary of non-target species observed was compiled.

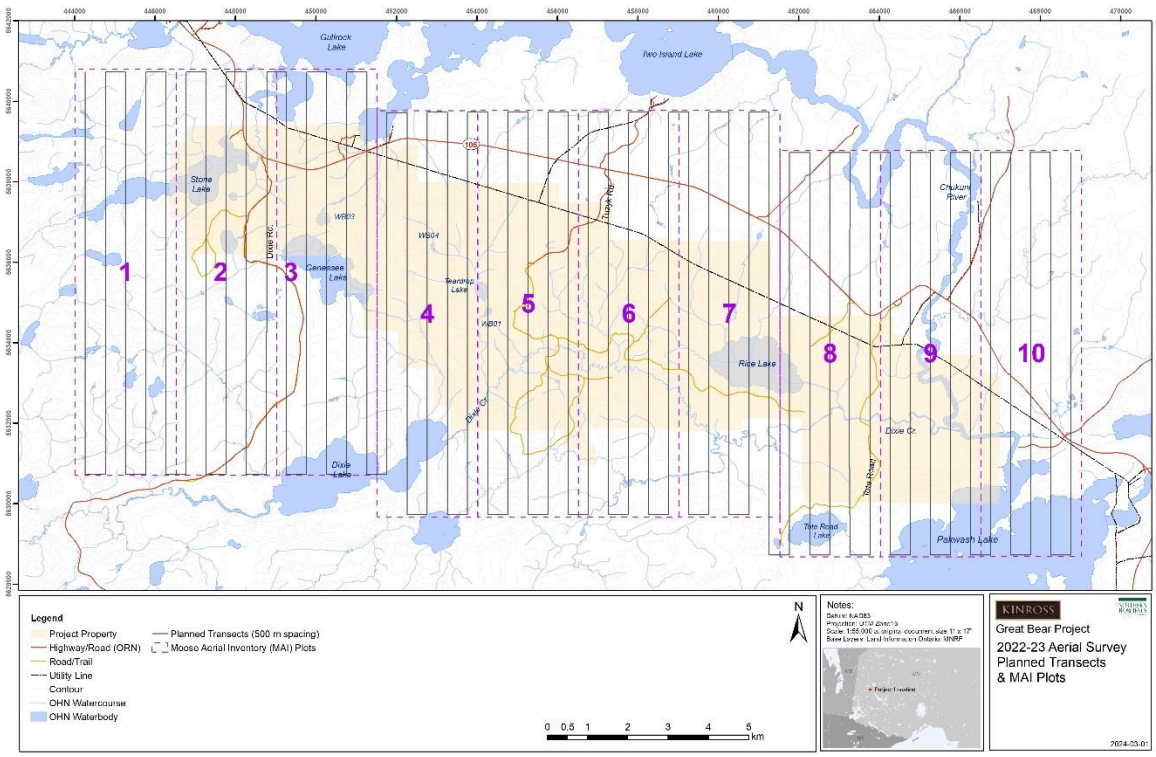


Figure 7. Aerial survey lines and moose aerial inventory (MAI) plots used during February 2022 and 2023 aerial surveys.

3.2.4.3 Bats

3.2.4.3.1 Acoustic Monitoring (ARUs)

3.2.4.3.1.1 Deployment

Potential use of the AOI by bats (including SAR) was monitored with Wildlife Acoustics™ SM4Bat FS and Song Meter Mini Bat autonomous recording units (ARUs). ARUs were deployed at 38 locations in 2022-2023 (Appendix 8) for a total of 1618 deployment-nights. Details of ARU deployments are provided in Appendix 8. ARUs were often deployed at more remote locations that were difficult or unsafe to survey on foot at night. These were usually along the margins of waterbodies and watercourses that potentially provide emerging insects with aquatic larval stages (e.g., mayflies) and along trails, roads, right-of-way, cutovers, and open areas that provide a less cluttered acoustic recording environment while providing open habitat for foraging by aerial hawking bat species (e.g., little brown myotis) as well as treed habitat for gleaning bat species (e.g., northern myotis). ARUs were deployed 2-3 m off the ground on trees, occasionally with the use of a tree ladder. Branches within 1 m of the unit were pruned where necessary to declutter the recording environment.

Recorders were programmed to be active from 30 minutes before sunset to thirty minutes after sunrise, triggered by sounds greater than 16,000 Hz. Sunset and sunrise times were calculated by the detector's software based on their coordinates and automatically adjusted daily. SM4Bat FS units used an external SMM-U2[2] ultrasonic microphone on a 5 m cable, which was typically cable-tied to a bare branch. Each Mini Bat had a built-in waterproof microphone. Microphones were oriented horizontally to maximize detection distance and aimed towards potentially suitable habitat.

The ARUs recorded in full spectrum and zero crossing. The distance of microphone sensitivity to ultrasonic calls is subject to multiple design and environmental factors, however, the dominant factor is atmospheric absorption of frequencies. Manufacturer estimates state that the SMM-U1 microphone has a spherical detection volume with a 22.1 m radius for 40 kHz frequencies, which increases (38.8 m) for lower frequencies (20 kHz) and decreases (6.5 m) for higher (100 kHz) frequencies.

3.2.4.3.1.2 Analysis

Bats were identified using the Auto ID feature in Kaleidoscope Pro software (version 5.1.9i) and a subset was confirmed visually. Kaleidoscope Pro uses sophisticated modelling to match recorded calls to an internal reference library, similar to voice recognition techniques. For each call, the slope, maximum frequency (i.e., the highest frequency), minimum frequency (i.e., the lowest frequency), and duration were determined, as those variables are believed to be species-specific and can be used in comparison to recorded calls. Each variable was then compared with a library of reference calls collected from individual bats that had been identified by species. The bat call (the call) was defined as a single, recognizable vocalization from one bat and a bat pass (the pass) as one or more sequential calls, representing calls from a single bat, recorded in one digital file.

Where call characteristics were not sufficiently diagnostic to identify the species, calls were grouped into the following categories:

- High frequency bats: Little Brown Myotis, Northern Myotis, Tri-colored Bat, and
- Big Brown Bat / Silver-haired Bat
- Lower Frequency Bats: Big Brown Bat, Silver-haired Bat, Hoary Bat, Eastern Red Bat.

[2] The SMM-U2 is Wildlife Acoustic's latest generation microphone; it's low noise and superior sensitivity results in quieter recordings, recording bats at greater distances, and longer triggered recordings.

3.2.4.3.2 Acoustic Surveys

Bats were also surveyed at 237 stations during in-person surveys at road-accessible locations on 13 dates during the May 19 to July 7 window in 2022 and 2023, in conjunction with surveys for nocturnal birds and amphibians (Appendix 6,. Ultrasonic calls by bats were surveyed using a hand-held Wildlife Acoustics Echo MeterTouch acoustic bat detector paired with an iPhone (Figure 10). It has proprietary software similar to the algorithms used in Kaleidoscope Pro for species identification.

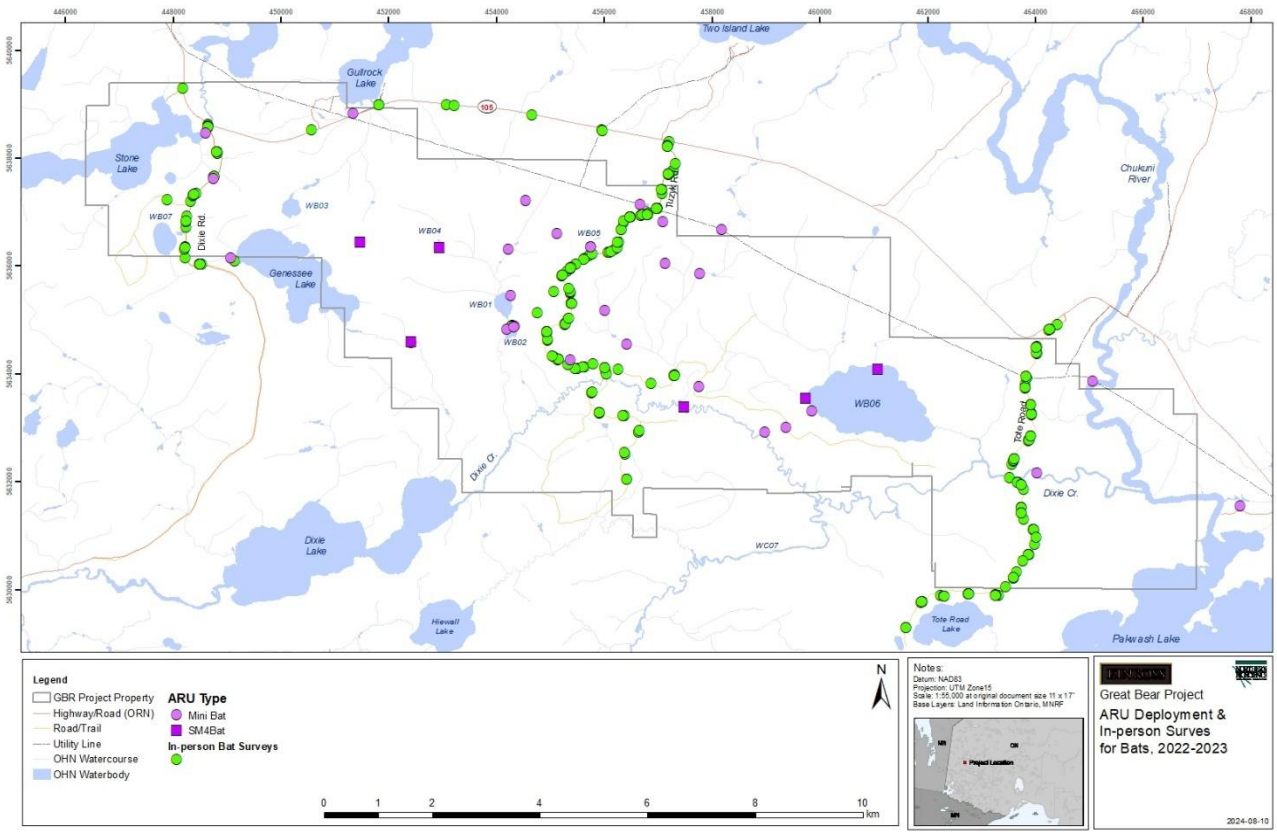


Figure 8. Location of 2022-2023 in-person surveys and autonomous recording units (ARUs) deployed for bats at the GBR property.

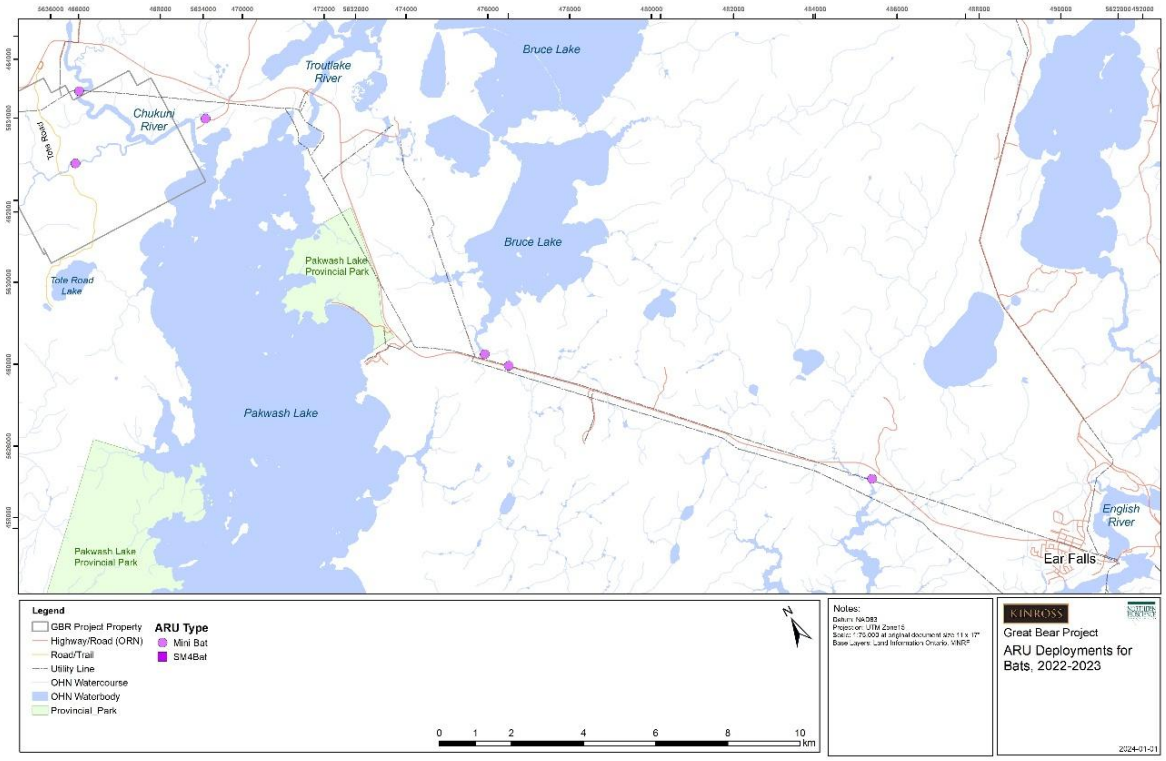


Figure 9. Location of 2022-2023 autonomous recording units (ARUs) deployed for bats at the GBR property along the transmission line corridor between the Great Bear Project AOI and Ear Falls.

Figure 10. Wildlife acoustics SM4Bat FS (left), Song Meter Mini Bat (centre) autonomous recording units (ARU) used for remote monitoring and Echo Meter Touch (right) used for in-person acoustic surveys.

3.2.4.3.3 Potential Roost Tree Surveys

Potential bat maternal habitat (OMNR 2011) was assessed in 2021 by surveys for cavity trees with methodology adapted from OMECP (2015) and OMNRF (2018). A total of 139 survey plots was conducted (Appendix 9). Methods consisted of the following:

- Potentially suitable ecosites based on MECP (2015) for the Great Bear Project area were screened from Forest Resource Inventory (FRI) for the Red Lake Forest;
- 27 suitable ecosite stands within the main Great Bear Project AOI with good access were identified.
- Within each stand, potential survey plot locations at least 50 m apart were randomly generated;
- Of these, survey a minimum of 10 for each of the 27 ecosite polygons were surveyed. Typically, do just 10 points per stand (ES polygon), but more were done if a stand was more heterogenous than expected;
- Priority was to get as many stands done as possible (rather than doing more than 10 survey points), with priority to:
    - getting good geographic representation of stands across the AOI, and
    - sampling at least one stand for each of the 8 ecosites if possible.
    - Spacing them out within a stand, but only if the other two priorities are met e.g., sample broadly within the stand if you can do it efficiently such as spacing them off the road, but don't spend a lot of time accessing on foot into the back of the stand
- At each survey point, a 12.5 m radius plot was established using a laser range-finder and the following information was recorded:
    - Date
    - Plot # e.g. A-045, X-387
    - Waypoint # (UTM coordinates)
    - # snags i.e., any tree >10 cm that has holes, cracks, cavities, sloughing bark large enough to provide roost for bats
    - For each snag, the following was record in a separate "Snag" table the following:
        - Date
        - Plot #
        - Snag #
        - Waypoint # of snag
        - Species
        - Approx. height (m)
        - Approx. diameter breast height (DBH) in cm
        - Notes: e.g., # and type of holes, cavities, evidence of use, etc.

Potential bat roost tree surveys were also conducted in 2023 concurrently with approximately 250 morning point counts for birds. While the primary observer was conducting each avian point count, a 12.5 m circular plot was assessed by the field technician for potential bat cavity trees similar to the targeted surveys conducted in 2021 during the leaf-off condition.

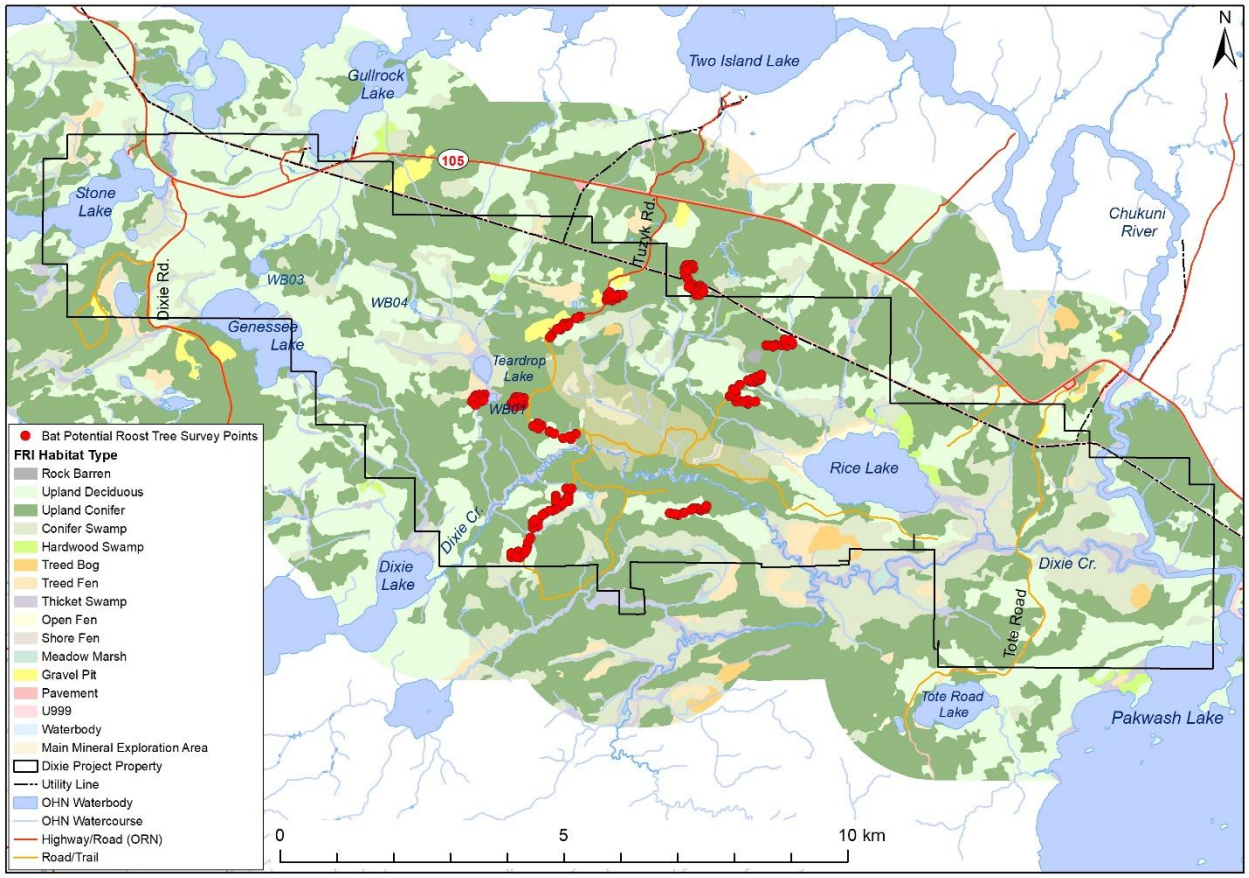


Figure 11. Location of November 2021 potential bat roost tree surveys.

3.2.4.3.4 Hibernacula Surveys

Bedrock fissures and talus were also examined in conjunction with other fieldwork.

3.2.4.4 Incidental Observations

During 2022-2022 fieldwork, georeferenced observations were recorded opportunistically for mammals and their habitat use such as:

- tracks and trails (all species)
- scat (all species)
- nests and dens (all species – considered significant wildlife habitat for some furbearers)
- bones and antlers (all species)
- scrapes and rubs (white-tailed deer)
- browsing (moose)
- cratering (woodland caribou)
- riparian/aquatic feeding platforms and slides (muskrat, otter)
- food caches (e.g. red squirrel)
- other evidence of foraging e.g., turned over rocks, ripped apart logs (black bear)
- dams, lodges, food piles, and felled trees (beaver)

Hundreds of kilometers of forest, rock barren, wetland, trail, transmission ROW, and road were surveyed on foot, ATV, vehicle, canoe, and/or motorboat, most of it multiple times and by multiple observers during 2021-2022 fieldwork.

3.2.4.5 Mammal Habitat Modeling

FRI-based spatial modeling of potentially suitable habitat was conducted for selected mammal species including the following:

- boreal caribou,
- wolverine,
- SAR bats i.e., little brown myotis, northern myotis, tricolored bat
- moose,
- black bear,
- beaver, and
- American marten.

Ontario's Landscape Tool (OLT) (Elkie et al. 2021) was used to quantify wildlife habitat for American marten, beaver, black bear, and moose. OLT is an integrated package of spatially-explicit habitat suitability models that use FRI in a GIS environment. OLT models for beaver and black bear were developed for the Great Lakes - St. Lawrence forests and have not been validated for the boreal forest (P. Elkie pers. comm.). This limitation notwithstanding, they are nonetheless the only OMNRF-supported models for these species and remain useful for better understanding potential Project effects on the habitat availability for these species. The following OLT habitat models were used:

- Black Bear: spring suitability, summer suitability. Fall suitability was not used due to the lack of hard mast tree species in the boreal forest (e.g., oak, beech); den suitability was not calculated due to the rarity of red and white pine in the RSA which are important in the Great Lakes – St. Lawrence (GLSL) model. Total suitability depends in part on fall and den suitability, so it was not calculated for the Project assessment.

- Moose: The September 2021 update for the landscape capability for moose model (LCMM) was used; this model has replaced the Bioclimatic Moose Model and the OWHAM moose models in OLT.

- Beaver: general habitat. Watercourse gradient was not used as a constraining factor. Potential beaver habitat was also assessed by comparison with small waterbody availability in the LSA and RSA using the Land Information Ontario (LIO) waterbody layer.

- American Marten: preferred habitat at the stand-level and 3000 ha block

3.2.5 Birds

3.2.5.1 Morning Point Counts

Songbird monitoring in 2022-2023 consisted primarily of 608 discrete plots spaced at least 250 m apart in representative habitats in the AOI (Figure 12). A total of 484 plots on or near the property had repeat point counts stations had repeat visits, with single point counts undertaken at the remaining 124 plots in order maximize spatial distribution, primarily along Highway 105 and the existing transmission corridor ROW, rather than repeat visits to the plots. There were therefore a total of 1092 plot-visits. Point counts were conducted June 1 to July 6, 2022, and June 1 to July 8, 2023. As per Environment Canada (2014), birds observed or heard were recorded at 3-, 2- and 5-minute intervals at distances of <50 m, 50-100 m, and >100 m (as well as flyovers). Point counts were conducted from shortly after sunrise until 09:30 under good weather conditions (i.e., no rain, wind <Beaufort 3). Plots were stratified by habitat type, with the intent to have at least 20 plots in each major habitat type.

Table 1. Summary of morning avian point counts for the Great Bear Project, 2022-2023.

Morning Bird Surveys	2022	2023	Total
Single Point Count	97	27	124
Repeat Point Count	261	223	484
Total # Plots	358	250	608
Total # Point Count	619	473	1092

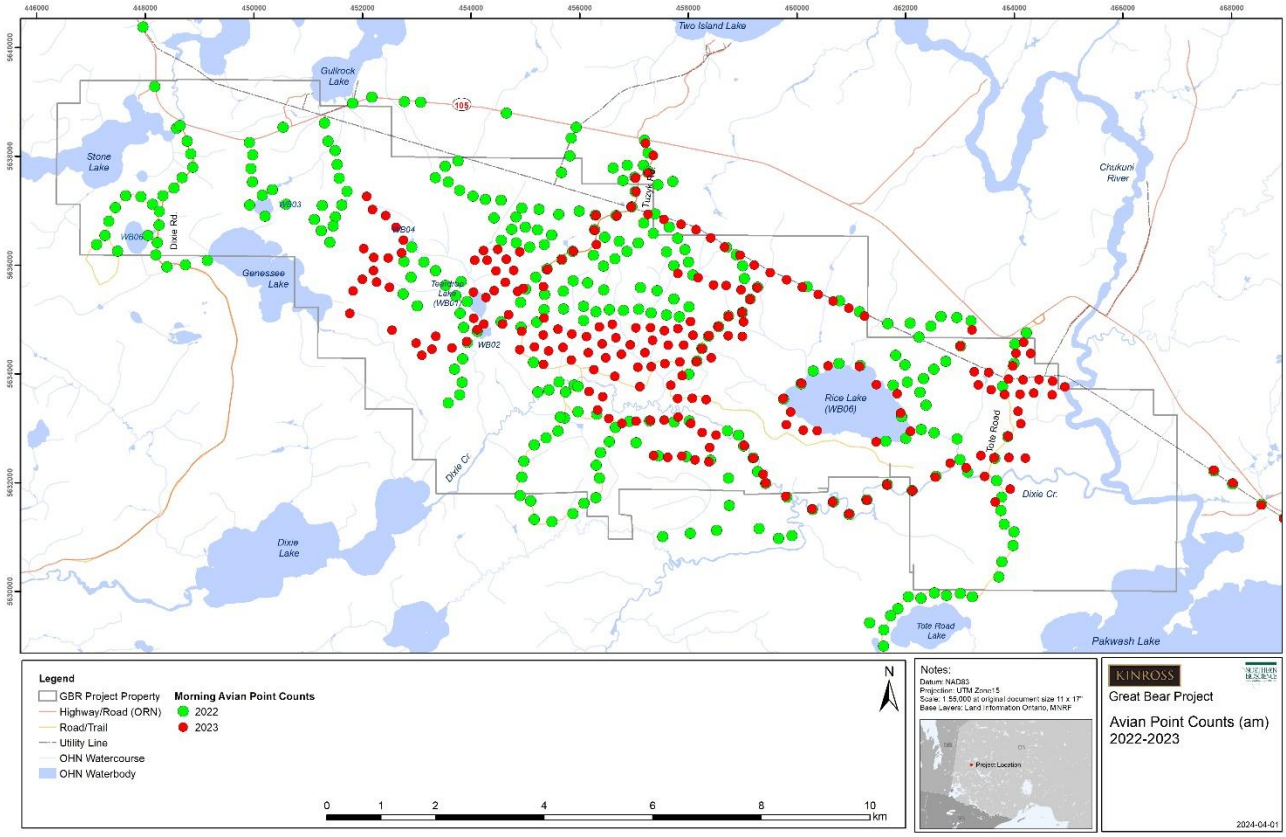


Figure 12. Location of 2022-2023 morning point counts for breeding birds.

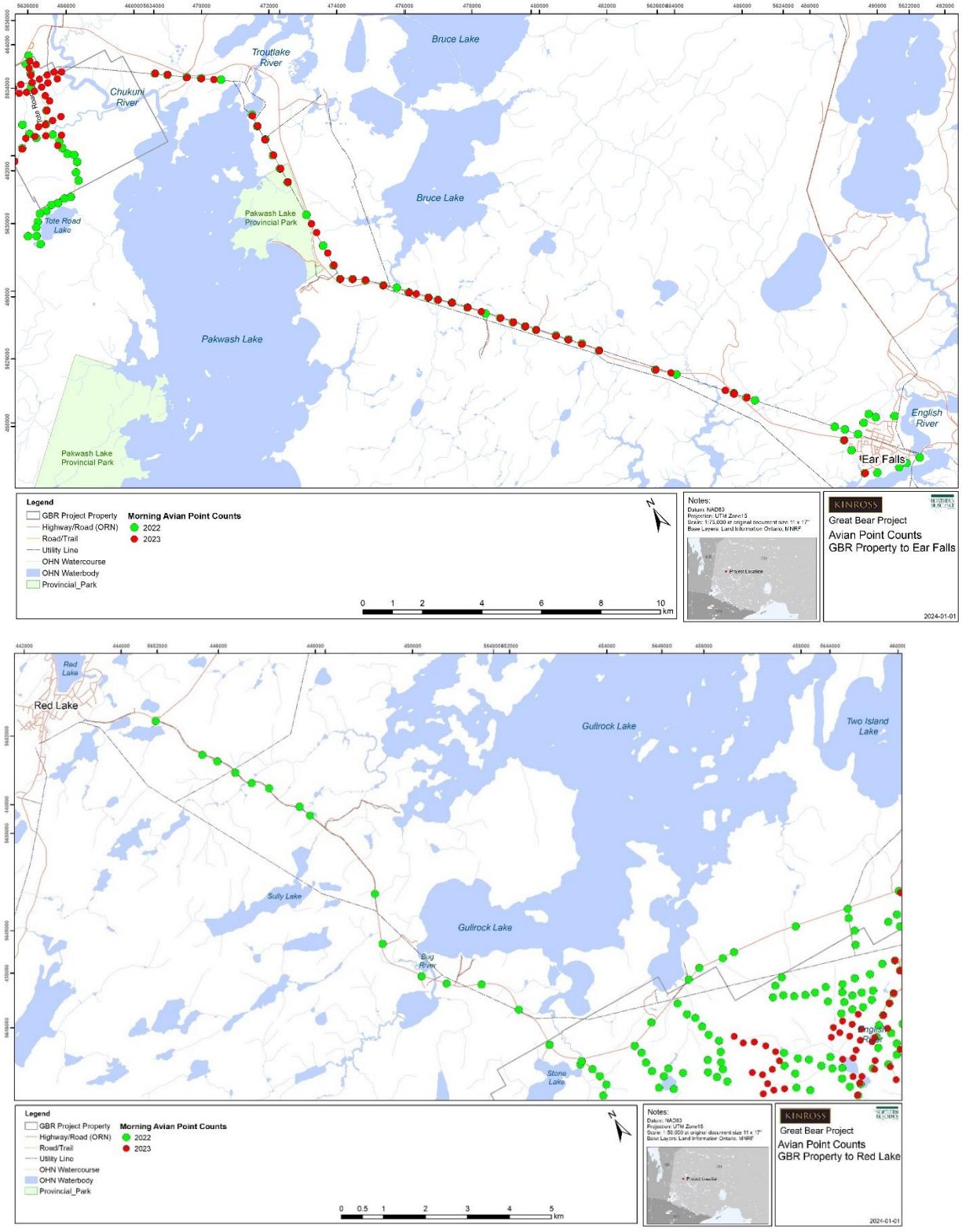


Figure 13. Location of morning point counts for breeding birds from the GBR Property north to Red Lake (upper image) and south to Ear Falls (lower image) north to Red Lake (lower image).

3.2.5.2 Owl Surveys

Methodology broadly followed the Ontario Nocturnal Owl Survey Protocol (BSC 2000). A total of 57 5-minute road-accessible survey stations spaced approximately 500 m apart were conducted from April 4 to May 9, 2022 (Appendix 6, Appendix 11). Surveys commenced 30 minutes after sunset. At each survey station, the standard broadcast audio file (provided by Birds Canada) was played using a portable speaker; the audio file consists of an:

1. initial beep then a 1-minute passive listening period,
2. a 20-second broadcast call of boreal owl,
3. another 1-minute passive listening period,
4. a 20-second broadcast call of a great grey owl, and a
5. a final 1-minute passive listening period,

The presence of other nocturnal birds such as grouse, American woodcock, and Wilson's snipe, as well as any calling amphibians, was also noted during the owl surveys. See Figure 14 for location of survey stations and Appendix 11 for details. Acoustic monitoring of owls was also conducted using ARUs; see *3.2.5.5 Acoustic Monitoring*.

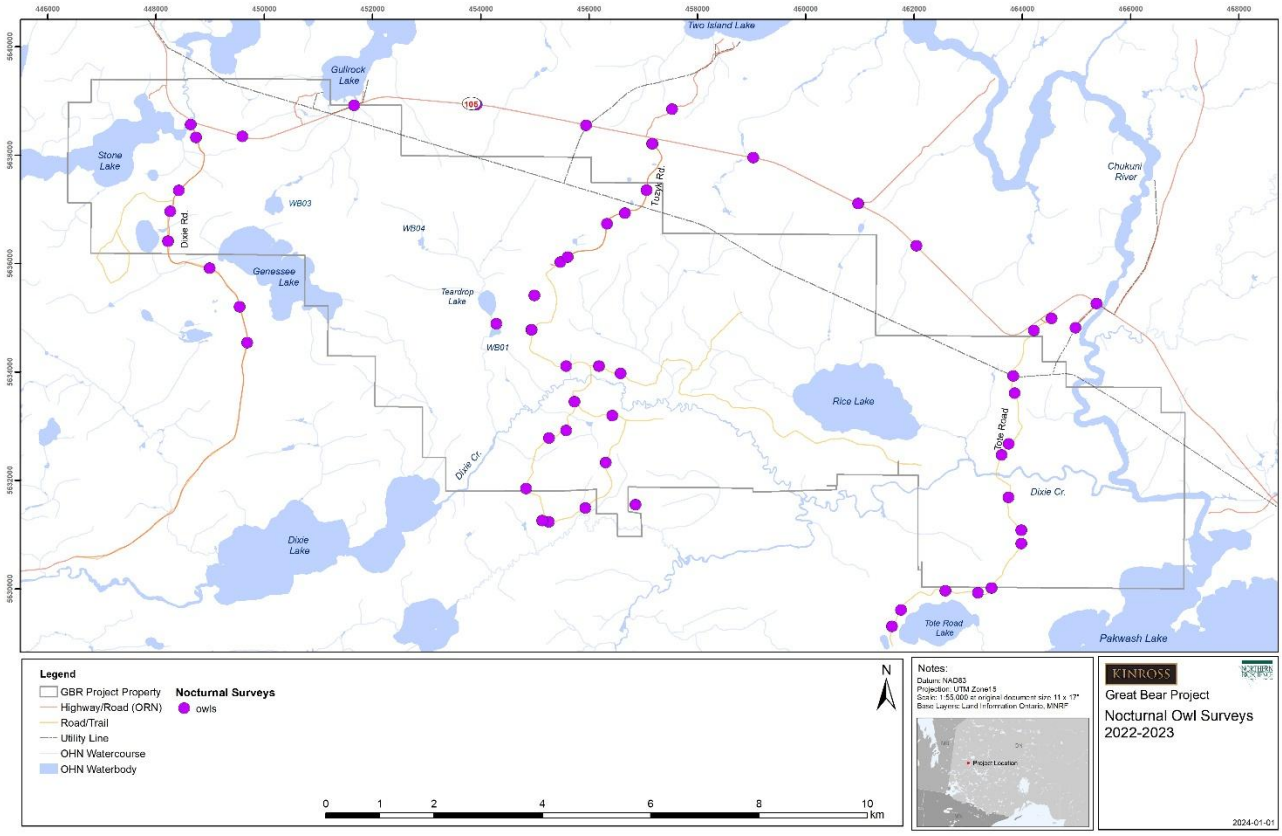


Figure 14. Location of in-person nocturnal surveys for owls, April-May 2022.

3.2.5.3 Nightjar Surveys

In-person surveys for nightjars (i.e., eastern whip-poor-will and common nighthawk) were conducted on 13 dates from late May through early July in 2022-2023. Methods generally followed OMNR (2013a) and Hannah 2021, with surveys timed to coincide with a week immediately preceding or after the full moons on May 16, June 14, and July 13, 2022. Nightjar surveys used 5-minute survey stops, spaced approximately 500 m apart within the local AOI. A total of 237 stations were surveyed, mainly along Tote Road (n=81), Tuzyk's Road (n=75), Dixie Loop Road (36), and Dixie North (n=33). Visual and acoustic surveys for common nighthawk were conducted along the same survey route at or just below sunset on the drive in before beginning the formal whip-poor-will survey approximately 30 minutes after sunset. Additional surveys were conducted along Highway 105 and the adjacent transmission line ROW where it was safe to stop. See Figure 15 for location of survey stations, Appendix 6 for a summary, and Appendix 7 for details of survey stations. Acoustic monitoring of nightjars was also conducted using ARUs; see *3.2.5.5 Acoustic Monitoring*.

3.2.5.4 Marsh Monitoring Program

The Marsh Monitoring Program (MMP 2011) survey protocol was used to assess marsh birds use of marshes in the Great Bear AOI in June-July 2022-2023. Each morning or evening survey station (i.e., plot) took approximately 15 minutes with 3-minute passive listening periods followed by playback of the most likely marsh bird species in the Project AOI i.e., American bittern, pied-billed grebe, sora, and Virginia rail, and yellow rail. A total of 26 modified[3] MMP plots (i.e., stations) were conducted in June-July 2022-2023 on five waterbodies and/or watercourses. See Figure 15 for location of survey stations, Appendix 6 for a survey summary, and for survey details. Acoustic monitoring of marsh birds was also conducted using ARUs; see *3.2.5.5 Acoustic Monitoring*.

[3] Methods deviated from the MMP protocol in that calls of marsh bird focal species that are not found in the Red Lake area were not used (e.g., king rail, common moorhen, etc.) for playback.

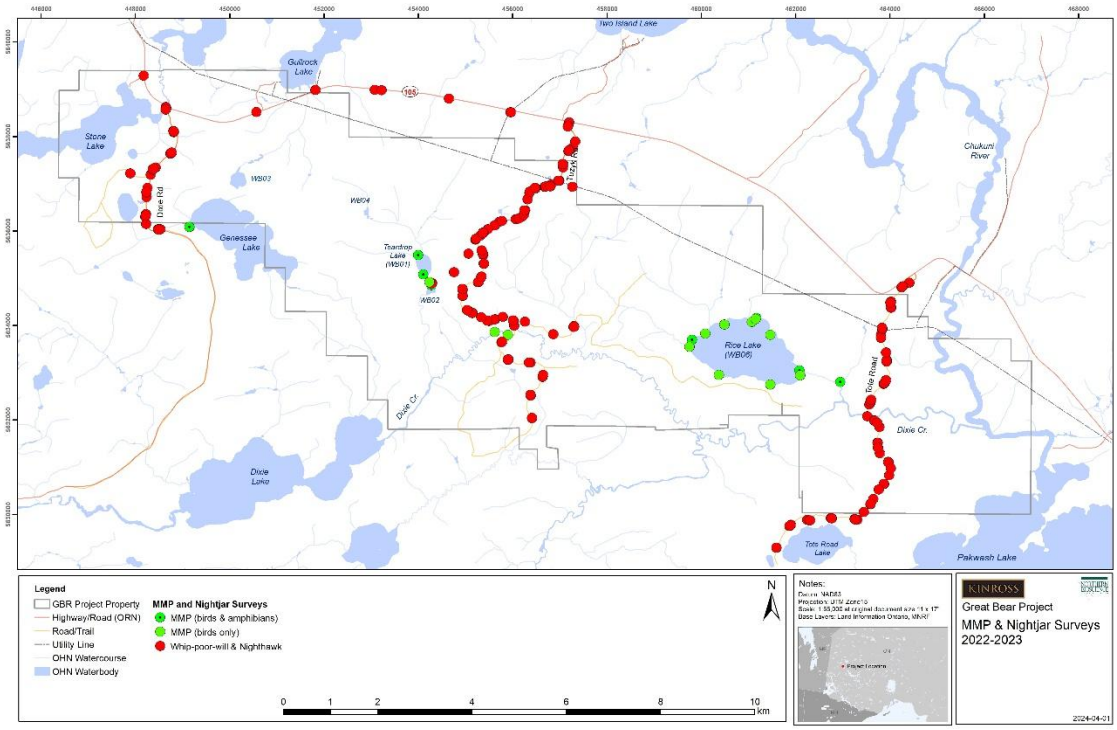


Figure 15. Location of 2022-2023 in-person nightjar surveys and Marsh Monitoring Program (MMP) survey stations.

3.2.5.5 Acoustic Monitoring

Potential use of the AOI by crepuscular and nocturnal birds such as owls, nightjars, and marsh birds was also monitored with ARUs. A total of 50 Wildlife Acoustics Song Meter Mini, Song Meter Mini Bat[4], and Song Meter Micro ARUs (Figure 16) were deployed at 90 locations on the Great Bear property as well as the transmission line ROW to Ear Falls. Recorders were programmed to record acoustic calls (i.e., birds and anurans) for 5-minute periods in the evening every hour on the hour from 30 minutes before sunset 20:00 through 24:00, and at 05:00. These recordings are analogous to point counts conducted during the dusk and dawn survey windows used in the Marsh Monitoring Program (MMP 2011). Sonograms were reviewed manually in Kaleidoscope Pro software (version 5.1.9g) and confirmed by ear. Due to health and safety issues of nocturnal access in remote areas of the AOI, acoustic recorders were preferable; they also allow multiple point counts to be conducted at each station every night for a much longer period that would be possible with in-person surveys. More than 3615 deployment-nights of acoustic recorders for birds were conducted in 2022-2023. See Figure 17 for ARU deployment locations and Appendix 8 for deployment details.

[4] With a secondary acoustic microphone to record birds and amphibians in mono.

Figure 16. Wildlife Acoustics SM Micro Autonomous Recording Unit (ARU) (left) and SM Mini Bat deployed at Great Bear Project (right) to detect crepuscular and nocturnal birds.

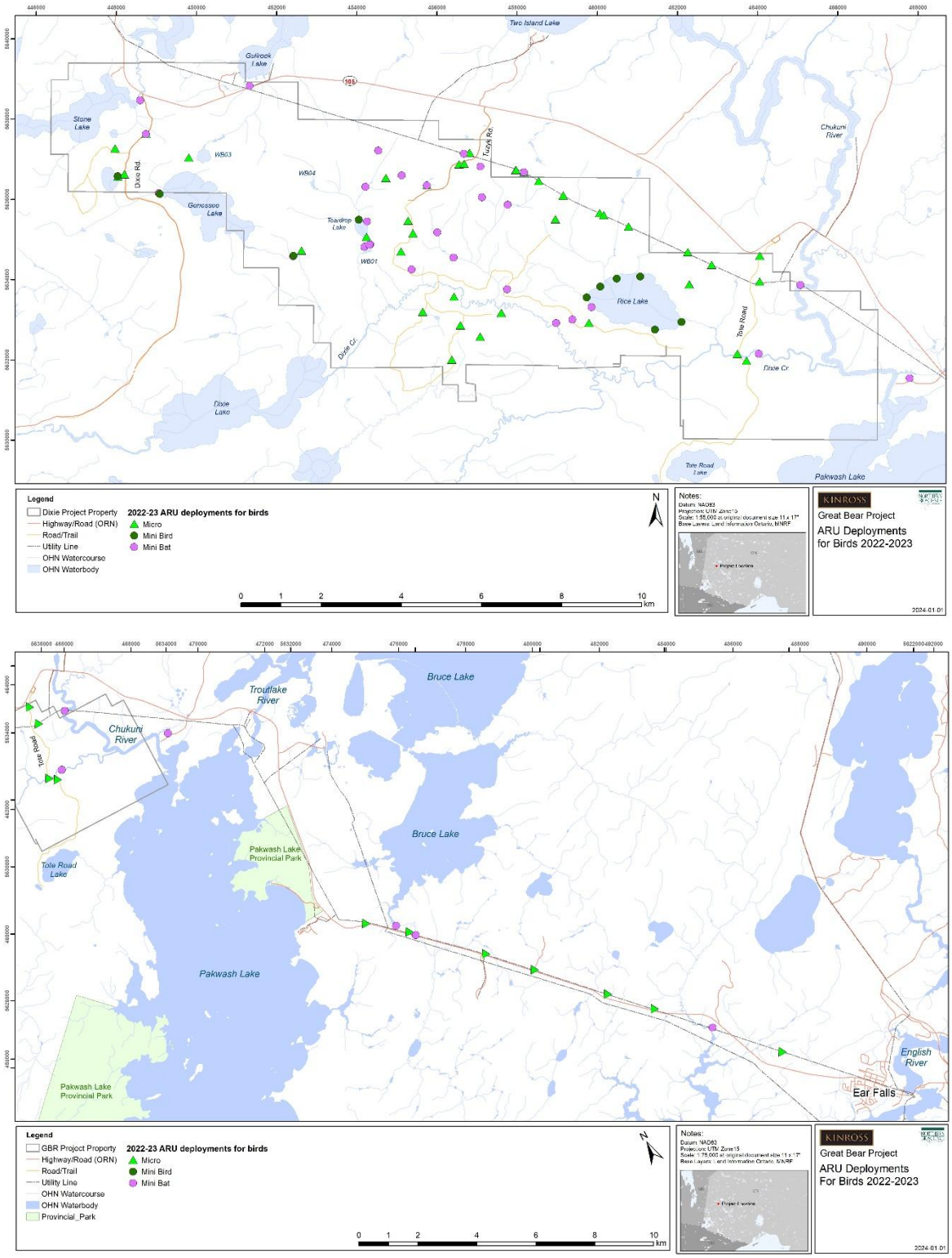


Figure 17. Location of 2022-2023 autonomous recording units (ARUs) deployed for birds at the GBR property (upper) and along the transmission line corridor between the Great Bear Project AOI and Ear Falls (lower).

3.2.5.6 Waterfowl & Waterbird Surveys

Over 40 waterfowl and waterbird surveys in 2021-2023 used the following methodologies to best meet survey conditions and objectives:

1) **Stationary Surveys** were used primarily on Rice Lake (WB06) and Teardrop Lake (WB01) and shorelines of selected waterbodies (e.g., Teardrop Lake, Genesee Lake, WB02) when conditions permitted (i.e., before wild rice was too tall to reduce visibility). At Rice Lake, each survey typically consisted of 30-60 minutes of scanning for waterfowl with a high-power spotting scope (e.g., Swarovski ATS 80), as well as with 10x42 binoculars (Figure 18). The same strategic viewpoint on the northeast shore of the lake, from which approximately 90% could be viewed, was used for each survey. A total of 21 stationary surveys were conducted on Rice Lake in 2022-2023, with an additional 14 surveys at Teardrop Lake, and 8 surveys on other waterbodies e.g., WB02, WB07, Stone Creek, Gullrock Lake, and Dixie Creek.
2) **Paddle Surveys** were used on 16 occasions on Teardrop Lake (WB01). At Teardrop Lake it proved impossible to accurately detect waterfowl from the shoreline during fall migration due to the thick wild rice; therefore, surveys typically consisted of at least 20-30 minutes of paddling two meandering transects across the long axis of the lake and counting waterfowl as they were flushed. Paddle surveys were also conducted at WB07 for resident waterfowl in early July in both 2022 and 2023, as well during surveys for other breeding birds and turtles (summarized in Appendix 16).
3) **Boat Surveys** were used on four occasions around the periphery of Rice Lake (WB06) to supplement stationary surveys for Rice Lake. Boating, rather than paddling, was the only practical on-water method to survey approximately 9.5 km of Dixie Creek upstream of Tote Road Bridge to the first set of impassable rapids. One survey was conducted along Dixie Creek on September 27, 2023, for migrant waterfowl as well as four other occasions for resident waterfowl during with other surveys in June-July for other turtles and other breeding birds and turtles (summarized in Appendix 16).
4) **Aerial Surveys** of waterbodies and larger watercourses in the AOI and surrounding landscape were conducted during spring (May 16) and fall (Sept.12) migration in 2023. A three-person survey crew (+ helicopter pilot) used two observers and a recorder for the spring survey and a 2-person crew for the fall survey.

See Figure 4 and Figure 19 for survey locations and Appendix 15 for additional details. In addition to these standardized surveys, shorter ad hoc surveys were conducted on other waterbodies and watercourses in the AOI in conjunction with other fieldwork in 2021-2023.

Figure 18. Waterfowl surveys on Rice Lake in September 2022 (left) and 2023 (right).

3.2.5.7 Incidental Observations

Observations of bird species were recorded opportunistically during other fieldwork in 2020 particularly for species that are difficult to detect with point counts or acoustic monitoring (e.g., raptors, waterfowl). Breeding evidence codes from the Ontario Breeding Bird Atlas (Cadman et al. 2007) were used. Particular attention was paid to potentially significant wildlife habitat as identified in OMNRF's (2017) draft criteria schedules for Ecoregion 3W such as migration stopover habitat (waterfowl, shorebirds), raptor nests, great blue heron nesting colonies, and colonial waterbird colonies (e.g., Bonaparte's gulls).

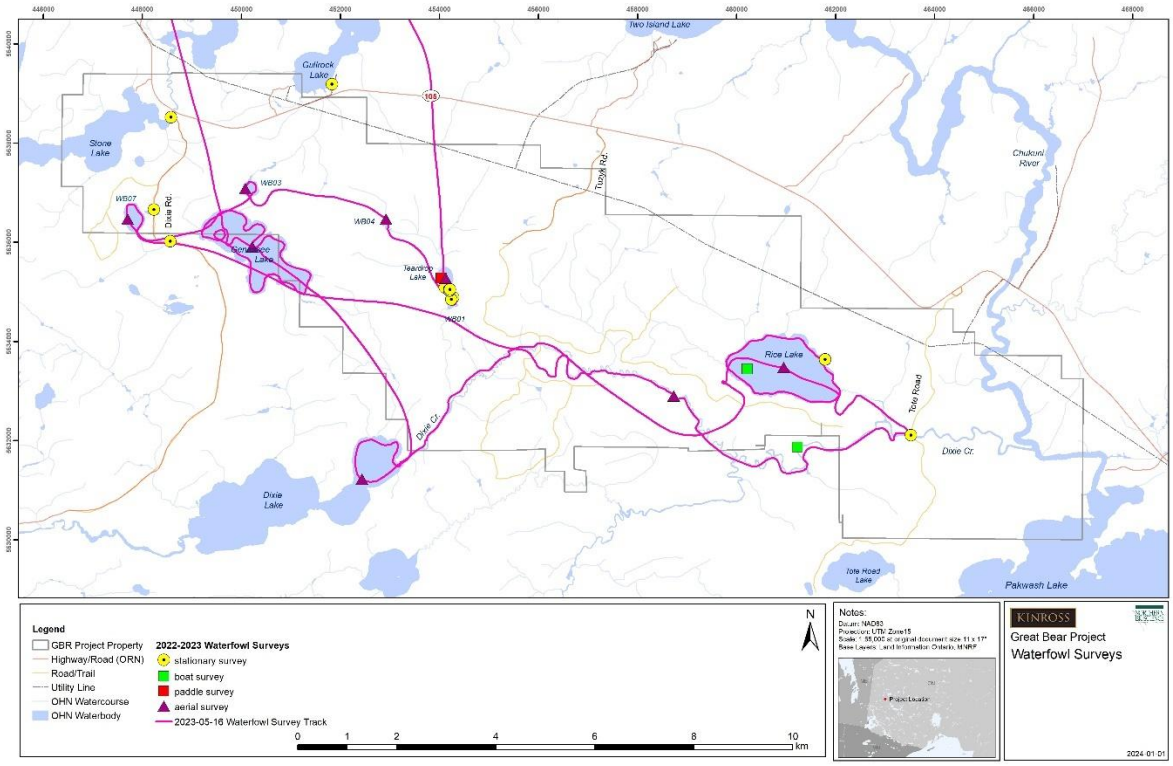


Figure 19. 2023-2023 stationary and mobile waterfowl surveys, and spring 2023 aerial waterfowl survey.

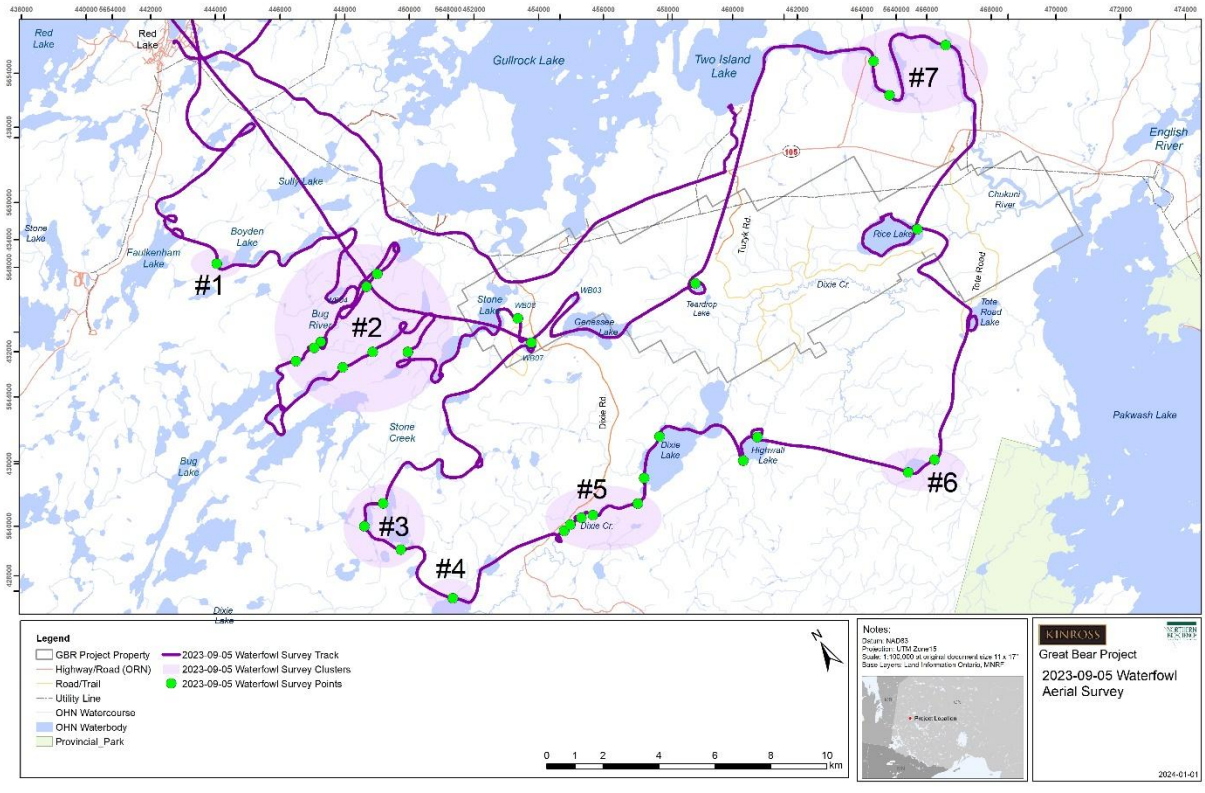


Figure 20. Fall 2023 aerial waterfowl survey.

3.2.5.8 Bird Habitat Modeling

FRI-based spatial modeling of potentially suitable habitat was conducted for the following selected bird species:

- eastern whip-poor-will & common nighthawk;
- Canada warbler,
- olive-sided flycatcher,
- evening grosbeak,
- eastern wood-pewee,
- rusty blackbird,
- short-eared owl, and
- yellow rail.

Where appropriate, guidance from Hanson et al. (2009) was also considered.

3.2.5.9 Songbird Density

Density of forest-breeding songbirds was estimated from point count data using the following formula (Blancher et al. 2007, 2013):

$$\text{Density} = (n * P * T) / (\pi * DD^2)$$

Where n = number of birds tallied on point count

P = Pair adjustment - multiplies estimate by up to 2, depending on whether one or both members of a pair are likely to be detected (a species-specific constant provided in Blancher et al. 2017)

T = time of day adjustment - Average Time of Day Adjustment: adjusts average count across all 50 BBS stops to a smoothed peak count.

DD = approximate detection distance (m) at peak time of day during a 3-minute BBS count, accounting for movement of birds during the count (a species-specific constant provided in Blancher et al. 2017)

Average density for each forest-breeding species and all species combined in the Project AOI were calculated from the individual point-count densities.

3.2.6 Reptiles and Amphibians

Reptiles and amphibians were surveyed in 2022-2023 using a combination of methods, often concurrently with other fieldwork during April-October fieldwork. Anuran (frogs and toads) calls were surveyed with the following:

- At 276 stations during 16 nocturnal surveys for nocturnal/crepuscular birds in April-July 2022-2023 (see Appendix 6, Appendix 7)
- More than 3615 ARU deployment-nights at 90 locations on the Great Bear property and Ear Falls transmission line ROW during April-July 2022-2023 (Appendix 8), and
- at 10 stations on three dates in June-July 2022 during modified Marsh Monitoring Program surveys (Appendix 12).

The project area is within the potential range of only two turtle species i.e., painted turtle (*Chrysemys picta*) and common snapping turtle (*Chelydra serpentina*), both of which lack standardized provincial

survey protocols. Therefore, relevant elements of the Casper and Hecnar (2011) and OMNR's (2015) survey protocol for Blanding's turtles were adapted for use to survey for the two potentially occurring species. A total of 20 targeted surveys for basking and swimming turtles were done on larger waterbodies and watercourses from the shoreline with 10 x 42 binoculars during May-August fieldwork (Appendix 16), with opportunistic surveys conducted during other fieldwork (e.g., waterfowl surveys, wetland mapping, fisheries assessment, morning avian point counts). Shorelines, access trails, and roads in the AOI were also searched for evidence of eggshells from predated nests as well as adult turtles.

Visual encounter surveys (e.g., Kendell 2002) for eggs, larvae, and adult reptiles and amphibians were conducted in conjunction with other fieldwork in suitable upland habitats, vernal pools, wetlands, and along the margins of permanent waterbodies and watercourses. Cover articles (logs, rocks) were flipped (and replaced) for salamanders and snakes. Particular attention was paid to potential significant wildlife habitat identified in the draft Ecoregion 3W criteria schedules (OMNRF 2017), such as snake hibernacula and multi-species vernal pools. Targeted searches for vernal pools were conducted in May 2022-2023, but were hindered by late snow cover and abnormally high seasonal flooding in 2022.

3.2.7 Insects and Other Taxa

Visual surveys were conducted for SAR insects such as monarch (*Danaus plexippus*) and yellow-banded bumblebee (*Bombus terricola*), as well as searches for potential larval host plants (e.g., milkweed *Asclepias* spp.) and nectar sources. Suitable habitats with wildflowers were surveyed along trails and roads as well as clearings, lakeshores, and wetlands.

During fieldwork for other taxa, surveys were conducted concurrently for significant wildlife habitat as defined by OMNRF (2000, 2017) and OMNR's Stand and Site Guide (OMNR 2010). Significant species that are not listed as SAR were also surveyed in 2022. Significant species and communities included those that are:

- tracked by NHIC or ranked S1-S3,
- regionally rare,
- locally or regionally features species by OMNRF,
- species of special management concern, and
- species near the limits of their range.

3.3 Significant Wildlife Habitat

OMNRF's *Significant Wildlife Habitat Technical Guide* (SWHTG) (OMNR 2000) is a detailed technical manual that provides recommended approaches for identifying, describing and prioritizing significant wildlife habitat. In recognition of the variability of the Ontario landscape, a draft addendum to the SWHTG has been developed that provides ecoregion-specific criteria for determining the significance of wildlife habitat. As previously discussed in *Policy Context,* criteria schedules for Ecoregion 4S are in development and in the interim, draft schedules for Ecoregion 3W (OMNRF 2017) will be used for guidance, as they are the only ones currently available. The draft ecoregion criteria schedules are based on expert opinion and the latest scientific literature to develop significance thresholds for significant wildlife habitat. The SWHTG and associated schedules provide detailed supporting information for the *Natural Heritage Reference Manual for natural heritage polices of the Provincial Policy Statement, 2005* (OMNR 2010).

As per the SWHTG, there are four general types of significant wildlife habitat:

- habitats of seasonal concentrations of animals;
- rare vegetation communities or specialized habitat for wildlife;
- habitat of species of conservation concern; and
- animal movement corridors.

These are discussed in more detail below.

3.3.1 Habitats of Seasonal Concentrations of Animals

According to the SWHTG, seasonal concentration areas are areas where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. OMNRF (2017) provides criteria for determining if seasonal concentrations of wildlife should be considered significant wildlife habitat. Potential seasonal concentration areas at the Great Bear AOI include the following:

- waterfowl stopover and staging areas (aquatic),
- waterfowl stopover and staging areas (terrestrial),
- shorebird migratory stopover areas,
- colonial bird nesting sites – bank & cliff,
- colonial bird nesting sites – trees & shrubs,
- colonial bird nesting sites – ground,
- eagle and osprey concentration area,
- sharp-tailed grouse lek,
- bat hibernacula,
- bat maternity colonies,
- amphibian breeding habitat,
- turtle wintering areas, and
- snake hibernacula.

3.3.2 Rare Vegetation Communities

According to OMNRF (2000, 2015), rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move

to or find alternative habitats. When assessing rare vegetation communities, one of the most important criteria is the current representation of the community in the planning area based on its area relative to the total landscape or the number of examples within the planning area. There are a number of criteria used to define rare vegetation communities, however the OMNRF's Natural Heritage Information Centre (NHIC) uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts. These ranks are not legal designations but have been assigned using the best available scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy (U.S.).

The ranks are based on three factors: estimated number of occurrences, estimated community aerial extent, and estimated range of the community within the province:

- S1 Extremely rare - usually 5 or fewer occurrences in the province, or very few remaining hectares.
- S2 Very rare - usually between 5 and 20 occurrences in the province, or few remaining hectares.
- S3 Rare to uncommon - usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.

The setting of criteria for significant wildlife habitat (SWH) has incorporated NHIC's ranking system into its process of determining rare vegetation communities and requires the vegetation community be considered dominant (i.e., absolute cover is >10% and/or relative cover is >35%; Lee 1998). As such, a rare vegetation community is defined to include areas that contain a provincially rare vegetation community and/or areas that contain a vegetation community that is rare within the planning area. Potential rare vegetation communities in the Great Bear Project AOI include the following:

- cliff and cliff rim,
- talus slopes,
- rock barrens,
- rare forest types,
- sand dunes,
- arctic-alpine communities,
- highly diverse areas,
- provincially rare vegetation communities (S1-S3), and
- regionally rare plant species.

3.3.3 Specialized Habitat for Wildlife

According to the OMNRF (2000, 2015a), some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size. Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife.

Potential specialized habitats for wildlife in the Great Bear Project AOI include the following:

- waterfowl nesting area,
- wild rice stand,
- milkweed patch,
- bald eagle and osprey nesting habitat,
- woodland raptor nesting habitat,

- turtle nesting habitat,
- aquatic feeding areas (moose or deer),
- seeps and springs,
- mineral licks,
- mammal denning site,
- marsh bird breeding habitat, and
- open country bird breeding habitat.

3.3.4 Habitats of Species of Conservation Concern

According to OMNR (2000, 2010), species of conservation concern include the following:

- species that are identified as Special Concern under the ESA on the SARO List, which were formally referred to as “Vulnerable” in the Significant Wildlife Habitat Technical Guide.
- species identified as nationally Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), but which are not protected in regulation under Ontario’s ESA.
- species that are rare or substantially declining in Ontario.
- species that have a high percentage of their global population in Ontario.

Species of conservation concern does not include habitats of provincially Endangered and Threatened species covered under PPS policy 2.1.3(a).

3.3.5 Animal Movement Corridors

Animal movement corridors are defined by the SWHTG as animal “elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another” and are often associated with shorelines, riparian areas (OMNR 2000). These corridors are typically linear habitats that are traditionally used by wildlife to move to one habitat from another. This is usually in response to different seasonal habitat requirements. Some examples are trails used by deer to move to wintering areas, and areas used by amphibians between breeding and summering habitat. Movement corridors that may potentially be considered SWH include those of amphibians, cervids, and furbearers.

4 VEGETATION & FUNGI

4.1 Plant Communities

Vegetation mapping for the Project was primarily based upon Forest Resource Inventory (FRI) using the draft provincial boreal ecosites (Banton et al. 2009) and supported by field verification and observations. Where possible, fieldwork in 2021-2022 confirmed the accuracy of ecosite designations and polygon boundaries within the AOI and were further refined in 2023. These ecosite-based vegetation communities helped support wildlife habitat modelling as well.

4.1.1 Forested Communities

The Great Bear Project property is dominated by upland conifer forest (Figure 22), upland deciduous forest, and conifer swamp (Table 2, Figure 21). A total of 47 boreal ecosites are represented in the FRI (Table 3), of which the most abundant are Ecosite B055 (Coarse Dry/Fresh Aspen-Birch Deciduous), Ecosite B099 (Fresh Silty/Fine Loamy Pine-Black Spruce Conifer), and Ecosite B128 (Organic Intermediate Conifer Swamp). These three ecosites collectively account for approximately 39% of the property. Water, including Rice Lake and portions of Genessee Lake and Dixie Creek, account for approximately 5.5% of the property.

The forests of the AOI exhibit an uneven age distribution due to a recent history of wildfire and ongoing forest harvesting (Figure 23, Figure 24). As a result of widespread wildfire and suitable well-drained soils, younger jack pine forest is widespread in the western and southern portions of the property (Figure 25). Not surprisingly, the oldest forests in the study are typically lowland conifer swamps, treed bogs, and treed fens such as Ecosite B126, B127, B128, and B136.

Table 2. Area of Great Bear Property by broad habitat type based on Forest Resource Inventory data.

Habitat Type	Area (ha)	% of Property
conifer forest	4039.7	44.6
deciduous forest	2499.9	27.6
conifer swamp	1129.5	12.5
water	500.3	5.5
thicket swamp	258.4	2.9
anthropogenic	171.2	1.9
treed fen	106.6	1.2
treed bog	95.2	1.1
open fen	93.8	1.0
meadow marsh	55.1	0.6
open water marsh	42.3	0.5
hardwood swamp	34.8	0.4
rock barren	14.3	0.2
marsh	6.5	0.1
Total	**9047.6**	**100.0**

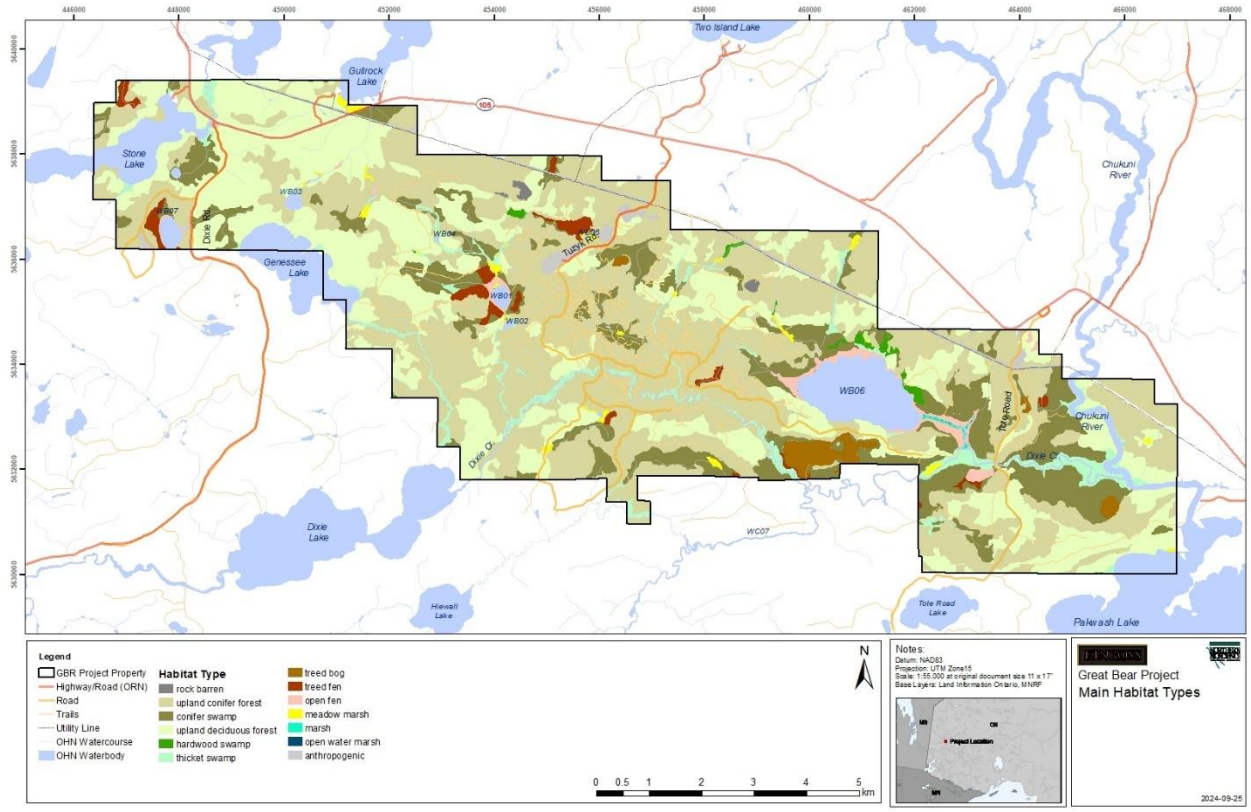


Figure 21. Main habitat types on the Great Bear Project property based on classified Forest Resource Inventory.

Figure 22. Typical upland conifer forest in the Great Bear Project AOI.

Table 3. Summary of vegetation communities in the Great Bear Resources property based on boreal ecosites (Banton et al. 2009) based on 2009 Forest Resource Inventory updated with 2023-2024 field observations

Ecosite	Ecosite Name	Area (ha)	% of Property
B007	Active Mineral Barren	7.9	0.09
B012	Very Shallow Dry/Fresh Pine-Black Spruce Conifer	172.0	1.90
B016	Very Shallow Dry/Fresh Aspen-Birch Deciduous	7.7	0.08
B033	Dry Sandy Red Pine-White Pine Conifer	12.9	0.14
B034	Dry Sandy Black Spruce-Jack Pine Dominated	223.2	2.47
B035	Dry Sandy Pine-Black Spruce Conifer	37.1	0.41
B040	Dry Sandy Aspen-Birch Deciduous	21.2	0.23
B048	Coarse Dry/Fresh Red Pine-White Pine Conifer	6.4	0.07
B049	Coarse Dry/Fresh Black Spruce-Jack Pine Dominated	268.5	2.97
B050	Coarse Dry/Fresh Pine-Black Spruce Conifer	781.3	8.64
B052	Coarse Dry/Fresh Spruce-Fir Conifer	88.5	0.98
B055	Coarse Dry/Fresh Aspen-Birch Deciduous	1489.9	16.47
B065	Coarse Moist Pine-Black Spruce Conifer	63.9	0.71
B070	Coarse Moist Aspen-Birch Deciduous	113.1	1.25
B082	Fresh Clayey Black Spruce-Jack Pine Dominated	54.4	0.60
B088	Fresh Clayey Aspen-Birch Deciduous	13.0	0.14
B098	Fresh Silty/Fine Loamy Black Spruce-Jack Pine Dominated	303.0	3.35
B099	Fresh Silty/Fine Loamy Pine-Black Spruce Conifer	1155.1	12.77
B101	Fresh Silty/Fine Loamy Spruce-Fir Conifer	116.1	1.28
B104	Fresh Silty/Fine Loamy Aspen-Birch Deciduous	745.6	8.24
B114	Fine Moist Pine-Black Spruce Conifer	747.7	8.26
B116	Fine Moist Spruce-Fir Conifer	6.9	0.08
B117	Fine Moist Conifer	2.5	0.03
B119	Fine Moist Aspen-Birch Deciduous	109.4	1.21
B126	Treed Bog	91.0	1.01
B127	Organic Poor Conifer Swamp	78.4	0.87
B128	Organic Intermediate Conifer Swamp	905.1	10.00
B130	Intolerant Deciduous Swamp	25.8	0.28
B133	Deciduous Swamp	9.1	0.10
B134	Mineral Thicket Swamp	57.4	0.63
B135	Organic Thicket Swamp	201.0	2.22
B136	Sparse Treed Fen	106.6	1.18
B138	Open Bog	4.1	0.05
B139	Poor Fen	82.3	0.91
B140	Open Moderately Rich Fen	11.5	0.13
B142	Mineral Meadow Marsh	45.3	0.50
B144	Organic Meadow Marsh	9.9	0.11
B149	Organic Shallow Marsh	6.5	0.07

Ecosite	Ecosite Name	Area (ha)	% of Property
B150	Open Water Marsh: Floating-leaved	1.2	0.01
B152	Open Water Marsh: Organic	41.1	0.45
B164	Rock Barren	6.4	0.07
B193	Active Coarse Clean Fill	45.4	0.50
B194	Coarse Clean Fill	1.3	0.01
B195	Active Fine Clean Fill	7.3	0.08
B197	Pavement/Concrete	117.2	1.30
B222	Mineral Poor Conifer Swamp	35.2	0.39
B223	Mineral Intermediate Conifer Swamp	110.7	1.22
	Water	500.3	5.53
	Total	**9047.6**	**100.0**

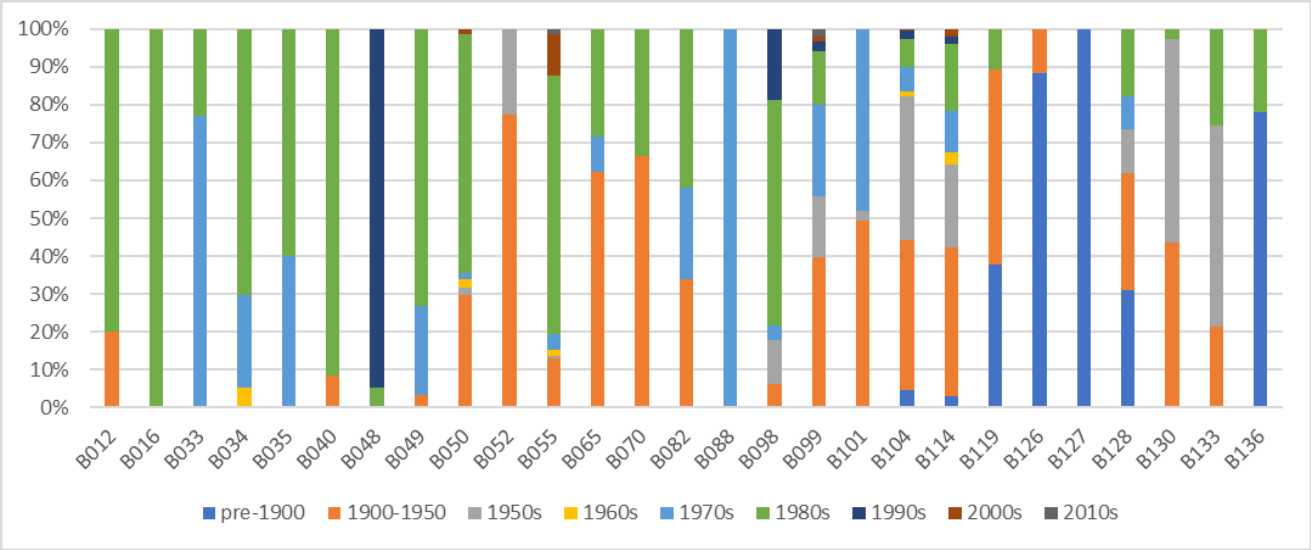


Figure 23. The proportion of decade of origin by ecosite for forests in the Great Bear Project AOI based on FRI.

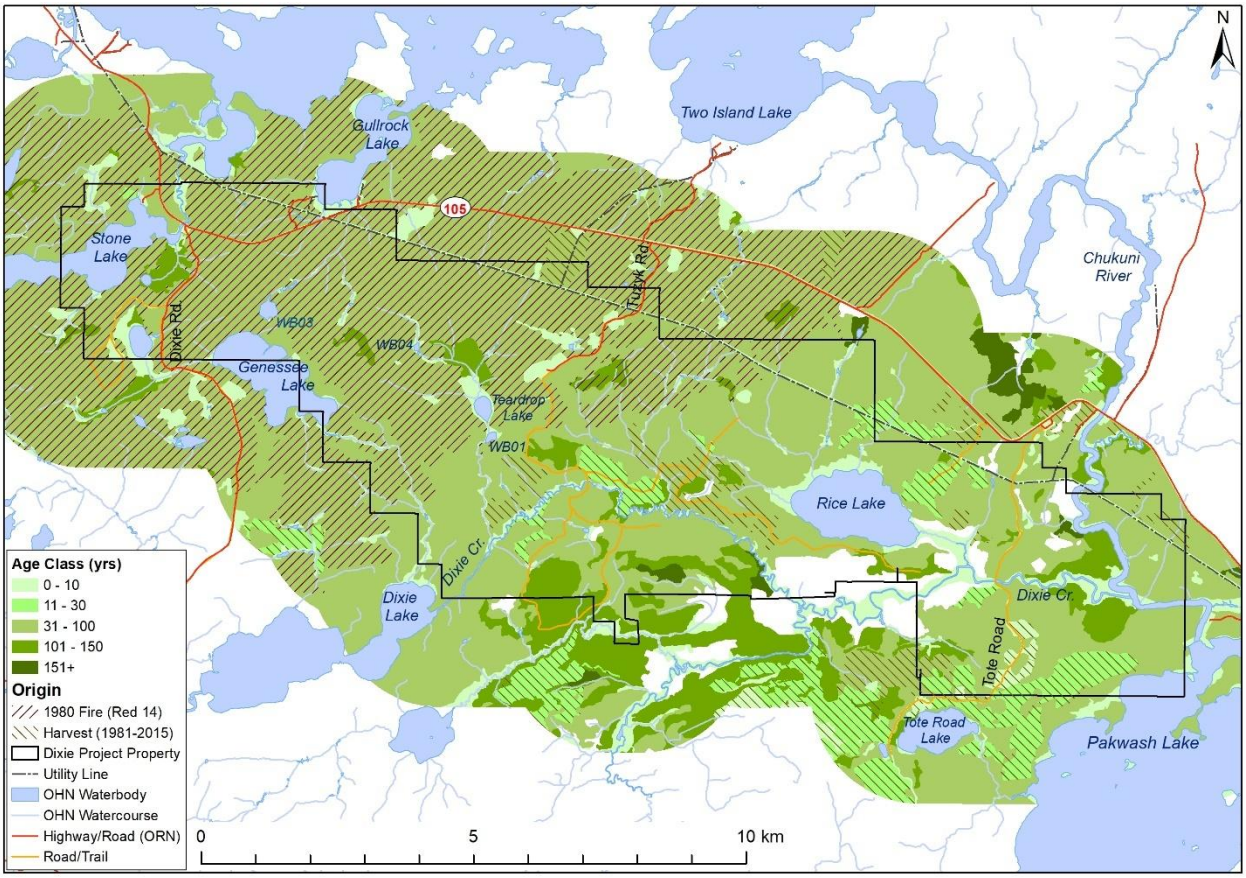


Figure 24. Forest age in the Great Bear Project AOI (2009 Forest Resource Inventory) with respect to 1990 wildfire and more recent forest harvest within or near the Dixie Project property.

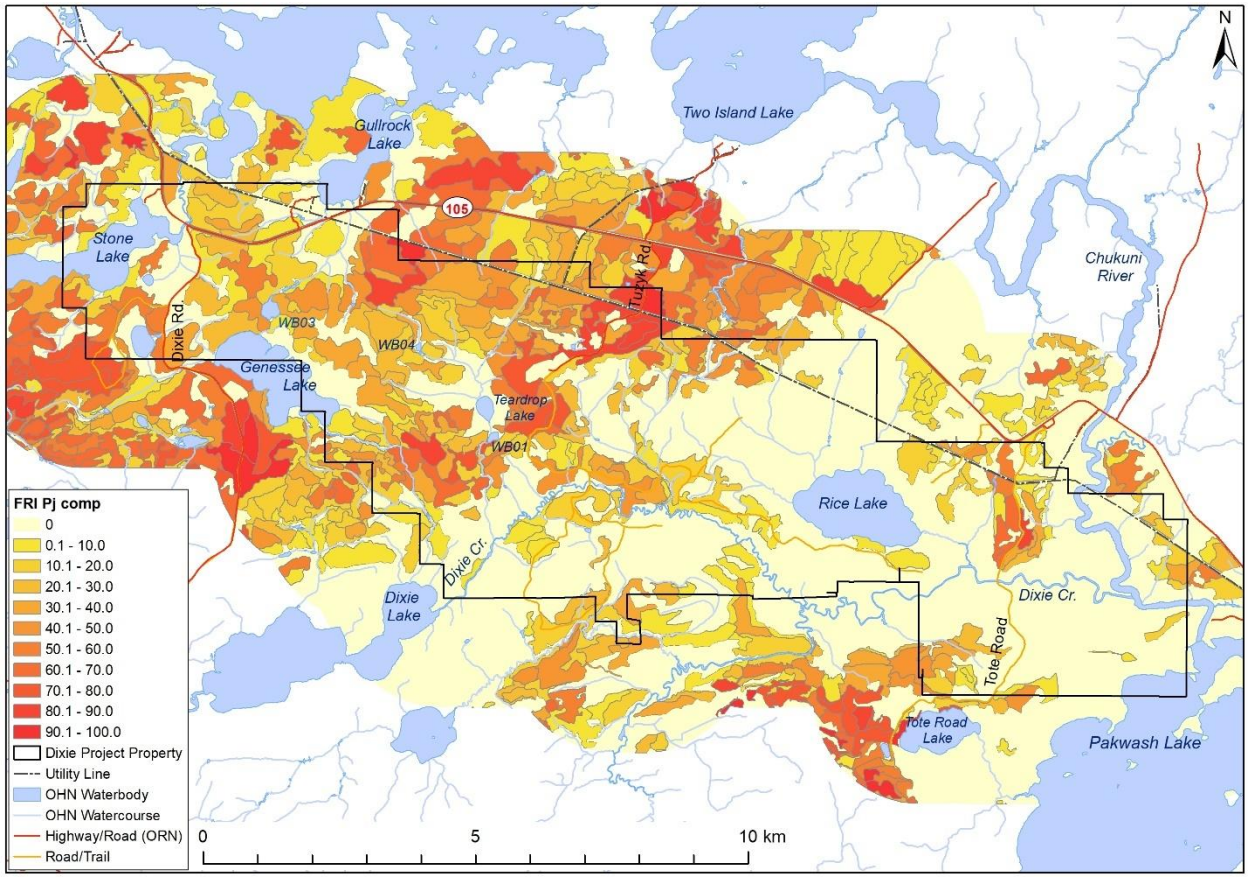


Figure 25. Jack pine overstory cover (%) in the Great Bear Project AOI (2009 Forest Resource Inventory).

4.1.2 Wetlands

Open wetlands on small waterbodies were typically not delineated in the Red Lake Forest FRI due to their lack of direct relevance to forest management and were left as “open water” (Figure 14). In addition, small patches of multiple wetland ecosites were often pooled in the FRI or incorrectly classified. Ecosite boundaries for open wetlands within the Great Bear Project AOI were therefore revised based on 2022 - 2023 field observations. Open wetlands are ecologically significant, can provide habitat for rare taxa, and have often been considered Valued Ecosystem Components (VEC) in an environmental assessment context

Open-water marshes on organic sediments (muck) i.e., B152 are found in quiet, shallow bays and margins of some of the waterbodies in the AOI. They are often dominated by pondweeds such as *Potamogeton richardsonii, P. natans,* and *P. vaseyi.* There are no large patches of open-water marshes in the Great Bear AOI that are dominated by floating-leaved plants such as yellow or white pond lilies (*Nuphar, Nymphaea*) or water shield (*Brasenia schreberi*).

Meadow marshes may be the most abundant open wetland class in the Great Bear AOI i.e., organic meadow marsh (B144) or meadow marsh on mineral soil (B142). Bluejoint grass (*Calamagrostis canadensis*) and robust sedges (e.g., *Carex stricta*, *C. aquatilis*, *C. lacustris*) are often dominant species in these vegetation communities. Meadow marshes were often formed on the exposed sediments in inactive beaver ponds where there had been a drawdown in water levels. Typically, these wetlands are only seasonally flooded during the spring, with little or little standing water later in the growing season.

Meadow marshes are often succeeded by and interspersed with thicket swamps, i.e., B134 or B135 depending on the substrate (mineral vs. organic). Prolonged flooding from renewed beaver activity can kill off the shrubby vegetation and convert it back to meadow marsh or other open wetlands. Thicket swamps were typically dominated by speckled alder (*Alnus incana*), red osier dogwood (*Cornus sericea*), and/or willows (*Salix* spp.) and were most common along stream systems.

Marshes are those wetland communities that are permanently flooded and dominated by herbaceous vegetation such as cattails (*Typha* spp.), burreeds (*Sparganium* spp.), bulrushes (*Schoenoplectus* spp.), sweetflag (*Iris versicolor*), spikerushes (*Eleocharis* spp.), and other narrow or broad-leaved emergents (Harris et al. 1996; OMNR 2014b). No shallow marsh ecosites such B148 or B149 were typed in the FRI. Within the Great Bear Project AOI, these ecosites are found in relatively small pockets interspersed with other wetland communities, typically as a narrow strip or scattered patches along the margins of beaver ponds or other permanent waterbodies, particularly Rice Lake and Dixie Creek. Bulrush-dominated marshes are found on the wave-swept shore of Rice Lake. Wild rice (*Zizania palustris*) also form emergent marshes and are discussed below.

Shore fens are one of the most abundant wetland communities along the margins of Rice and Teardrop lakes, as well as Dixie Creek. These may either be *Sphagnum* and/or graminoid-dominated (B146) or shrub-dominated (B146) (i.e., >25% cover of shrubs). These communities form a floating mat[5], extending out over deeper water and often rising and falling with fluctuating water levels. Typical species in shore fens include peat mosses (e.g., *Sphagnum squarrosum*), wire sedge (*Carex lasiocarpa*), few-seeded sedge (*Carex oligosperma*), and three-way sedge (*Dulichium arundinaceum*). Dominant shrubs often include leatherleaf (*Chamaedaphne calyculata*), sweet gale (*Myrica gale*), and bog birch (*Betula pumila*), and stunted speckled alder (*Alnus incana*). Shore fens may grade into grounded fen or directly abut the bedrock or other shoreline.

4.1.3 Provincially Significant Wetlands

The wetlands in the AOI had not been formally evaluated for provincial significance under the Ontario Wetland Evaluations System (OWES) – Northern Manual (OMNRF 2022). Wetlands centred on Unnamed Waterbody WB01 (“Teardrop Lake”) and WB06 (“Rice Lake”) had potential to rank as provincially significant wetlands (PSW) based on wetland size, diversity, hydrological function, and special features such as wild rice. These wetlands support wild rice and other marshes (open-water, emergent, and/or meadow marshes), as well as shore fen, thicket swamp, treed swamp, and potentially other contiguous wetland types (Figure 27). Fieldwork conducted in 2022-2023 supported the formal evaluation of wetlands under the OWES Northern Manual, with assistance from Al Harris (Harris Ecological Consulting), a certified wetland evaluator.

Teardrop Lake Wetland, centred on WB01, was found to be provincially significant with a total wetland score of 676 points and a score of 250 points for Special Features. The full evaluation report for Teardrop Lake Wetland is presented in Appendix 17. Rice Lake Wetland, centred on WB06, is not provincially significant with a total wetland score of 548 points and a score of 124 for Special Features. The full evaluation report for Rice Lake Wetland is presented in Appendix 18.

To qualify as provincially significant under the OWES, a wetland must achieve a total score of 600 or more points or score at least 200 points for either the Biological or Special Features components. Despite being larger than the Teardrop Lake Wetland 1197 ha vs 189 ha), the Rice Lake Wetland scores much lower on Hydrological Function and Special Features than the Teardrop PSW. The wetland downstream of the Rice Lake Wetland along Dixie Creek and the Chukuni River was not formally evaluated as is less

[5] They are sometimes erroneously referred to as a “floating bog”, but are actually fens as they have contact with nutrient-rich water

likely to score as provincially significant than Rice Lake Wetland based on field observation and is downstream of any anticipated direct effects of the Project.

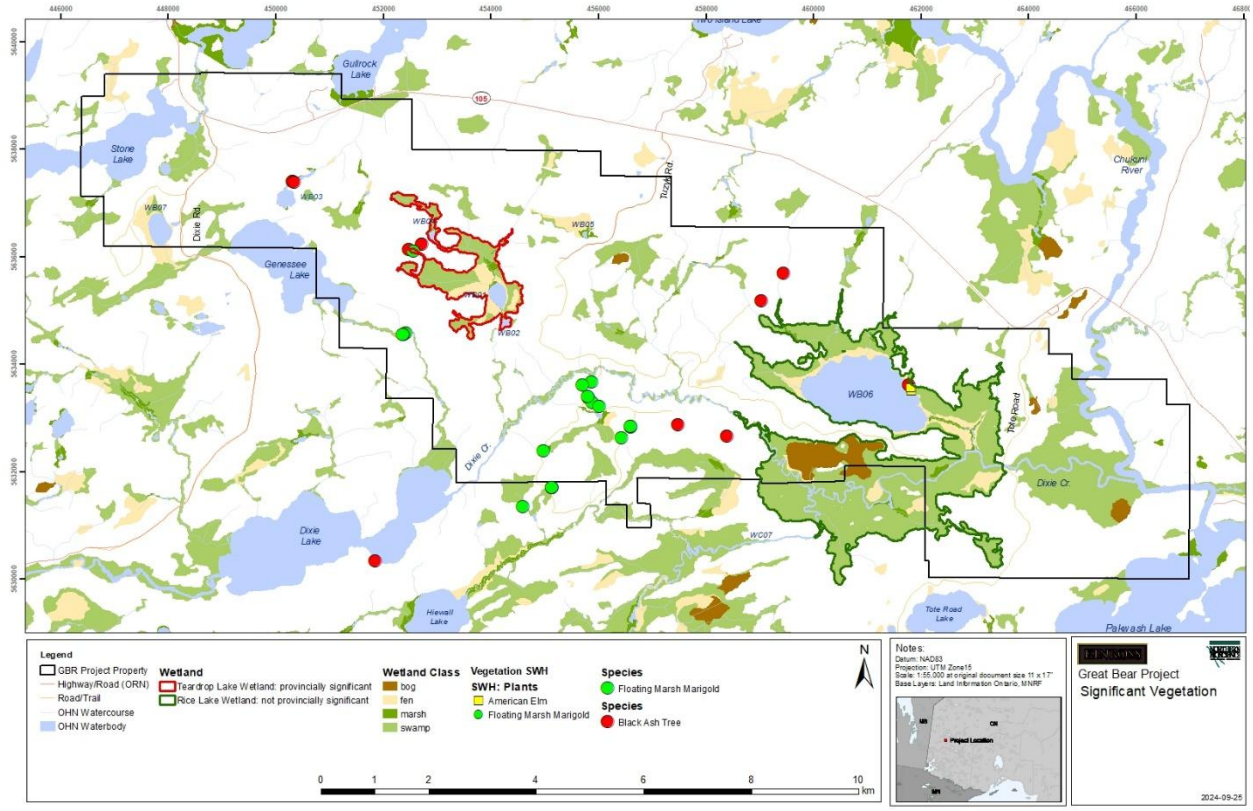


Figure 26. Wetlands and significant vegetation in the Great Bear AOI.

Figure 27. Marsh and shore fen communities on Rice Lake (left) and poor conifer swamp (right) near Teardrop Lake.

4.1.4 Wild Rice

4.1.4.1 Teardrop Lake and Rice Lake

Results of quadrat sampling on Teardrop Lake (WB01) and Rice Lake (WB06) are presented in Appendix 20 and Appendix 21. Maps of wild rice distribution are presented in Figure 29. Field photos of Teardrop and Rice lakes are presented in Figure 30 from Figure 35. Wild rice stand of >1 ha are considered significant wildlife habitat, at least in Ecoregion 3W.

Wild rice was consistently abundant in Teardrop Lake in all years surveyed, with wild rice covering more than 90% of 10.4 ha waterbody. Teardrop Lake consists of a shallow basin with a substrate of sedimentary organic material, generally greater than 50 cm deep. Rice is distributed throughout the lake but appears to be most dense in a 3-m wide band around the edge of the lake. Rice is also taller and denser in the outlet channel linking Teardrop Lake with Unnamed Waterbody WB02 downstream.

Despite initial high flooding in spring of 2022, water levels in Teardrop Lake receded enough to allow robust development of rice. In 2022, water depth on surveyed plots on August 22 on Teardrop Lake ranged from 34 cm to 66 cm, with a mean of 49.2 cm (Table 4).

In contrast, wild rice abundance on Rice Lake was highly variable among years surveyed. Rice Lake is much larger, covering 218 ha and with a maximum water depth of 1.78 m and a mean depth of 1.26 m. Approximately 27 ha of wild rice was present on Rice Lake on October 13, 2021, with about 14 ha on the southeast end of the lake, 9 ha at the west end, and a couple of small patches (each <1ha) in small coves along the south shore. In contrast, there was very minimal wild rice development in 2022, with only a very narrow (~5m) band of wild rice along approximately 400 m of shoreline at the west end of the lake, and a few small patches at the southeast end of the lake. In total, there were estimated to be approximately 0.5 ha of wild rice in 2022 on Rice Lake. With a return to more typical water levels in 2023, approximately 35 ha supported wild rice on Rice Lake. Most wild rice grows on the west and southeast ends of the lake with scattered patches elsewhere. Where rice is found on Rice Lake, the aquatic substrate is predominantly sedimentary organic material, but some rice was rooted directly in clay near the shoreline.

In 2023, the average water depth measured at survey quadrats on Rice Lake was 96.6 cm, significantly deeper than at Teardrop Lake (28.3 cm) (Table 4). Water pH and conductivity were significantly also higher in Rice Lake than in Teardrop Lake (Table 4), possibly related to the greater clay in the soils of the surrounding watershed. Dissolved oxygen concentration was also greater in Rice Lake, probably due to the greater surface are leading to better mixing of surface waters.

In 2023, wild rice was about 50% denser on Rice Lake than on Teardrop Lake (Table 4). Stalks were also significantly taller in Rice Lake in 2023. This contrasts with 2022 when rice was visibly taller, denser, and more widespread in Teardrop Lake. Record high flood conditions in the Winnipeg River Basin in early 2022 (LWCB 2022) likely suppressed germination and growth of wild rice, as was the case in Eagle Lake near Dryden, Ontario (Harris pers. obs.). High water levels in the early growing season cause reduced survival by reducing light penetration to developing seedlings and uprooting and drowning young plants (Aiken et al. 1988; Archibold et al. 1989; Meeker 1999). Teardrop Lake is near the headwater of a small watershed where flooding was of shorter duration and smaller magnitude than in Rice Lake, allowing greater rice germination and growth. The less vigorous growth in Teardrop Lake in 2023 compared to 2022 may have been related to the cyclical productivity of wild rice. Years with high rice production are frequently followed by a year of low productivity and then gradual recovery (Anon. 2008). Accumulation of rice stalks from the previous years appears to inhibit growth and seed production by locking up nitrogen (Durkee Walker et al. 2006). Rice stalks were also noticeably greener on Rice Lake than Teardrop Lake in 2023, possibly due to an early frost on the latter (Figure 30, Figure 31).

Table 4. Comparison of wild rice and environmental parameters in Teardrop and Rice lakes, 2022-2023.

Parameter (means)	Teardrop L. 2022	Teardrop L. 2023	Rice L. 2023
Rice Density (stems/m^2)	31.1	21.8	32.8*
Stem Height (cm)		73.4	107.0*
Water Depth (cm)	49.2	28.3	96.6*
pH		7.3	7.8*
Conductivity (µS/cm)		41.0	89.0*
Dissolved Oxygen (mg/l)		5.5	7.3

* indicates significant difference ($p<0.01$) between Rice and Teardrop lakes in 2023. There was no measurable rice on WB06 in 2022.

Competition did not appear to be a significant factor in rice abundance. Associated species i.e., yellow water-lily (*Nuphar variegatum*), pigmy water lily (*Nymphaea tetragona*), arum-leaved arrowhead (*Sagittaria cuneata*), floating bur-reed (*Sparganium fluctuans*) and pondweed (*Potamogeton epihydrus*), typically accounted for less than 1% cover on plots on Teardrop Lake in 2022. Floating-leaved burreed (*Sparganium fluctuans*) was present in most quadrats in Teardrop Lake in 2023, but uncommon in Rice Lake. No invasive plant species were observed on either lake in 2022 or 2023.

On September 24th, 2022, the wild rice on Teardrop Lake was approximately 80% off the stem, with noticeable damage from foraging waterfowl (broken, bent stems, striped of seeds). In 2023, damage by waterfowl feeding was evident on Teardrop Lake where most rice stalks were bent over and stripped of grains. Damage was proportionally lower on Rice Lake, where evidence of waterfowl feeding was greatest at the outer edge of the rice stand. Both lakes are attractive to migrating ducks and geese (see *6.5 Waterfowl & Waterbirds*).

Two pest species were observed in low abundance in 2022 and 2023 but neither had an evident effect on rice productivity. Wild rice Ergot (*Claviceps zizaniae*), a fungal infection of rice grains, was present on a small proportion of stems in a small area on the north side of Teardrop Lake (Figure 28). This species occasionally occurs at high density and can cause the failure of rice crops (Aiken et al. 1988). Overall, less than 1% of heads appeared affected. Rice worm moth (*Apamea apamiformis*) larvae were observed in small numbers on Teardrop Lake in 2022 and both lakes in 2023 (Figure 28). Caterpillars feed on developing wild rice grains and at high density can cause destruction of entire stands (Aiken et al. 1988). Their impact on wild rice in the AOI is likely small, however.

Figure 28. Wild rice ergot (*Claviceps zizaniae*) (left) and wild rice worm (*Apamea apamiformis*) (right) at Teardrop Lake, September 2023.

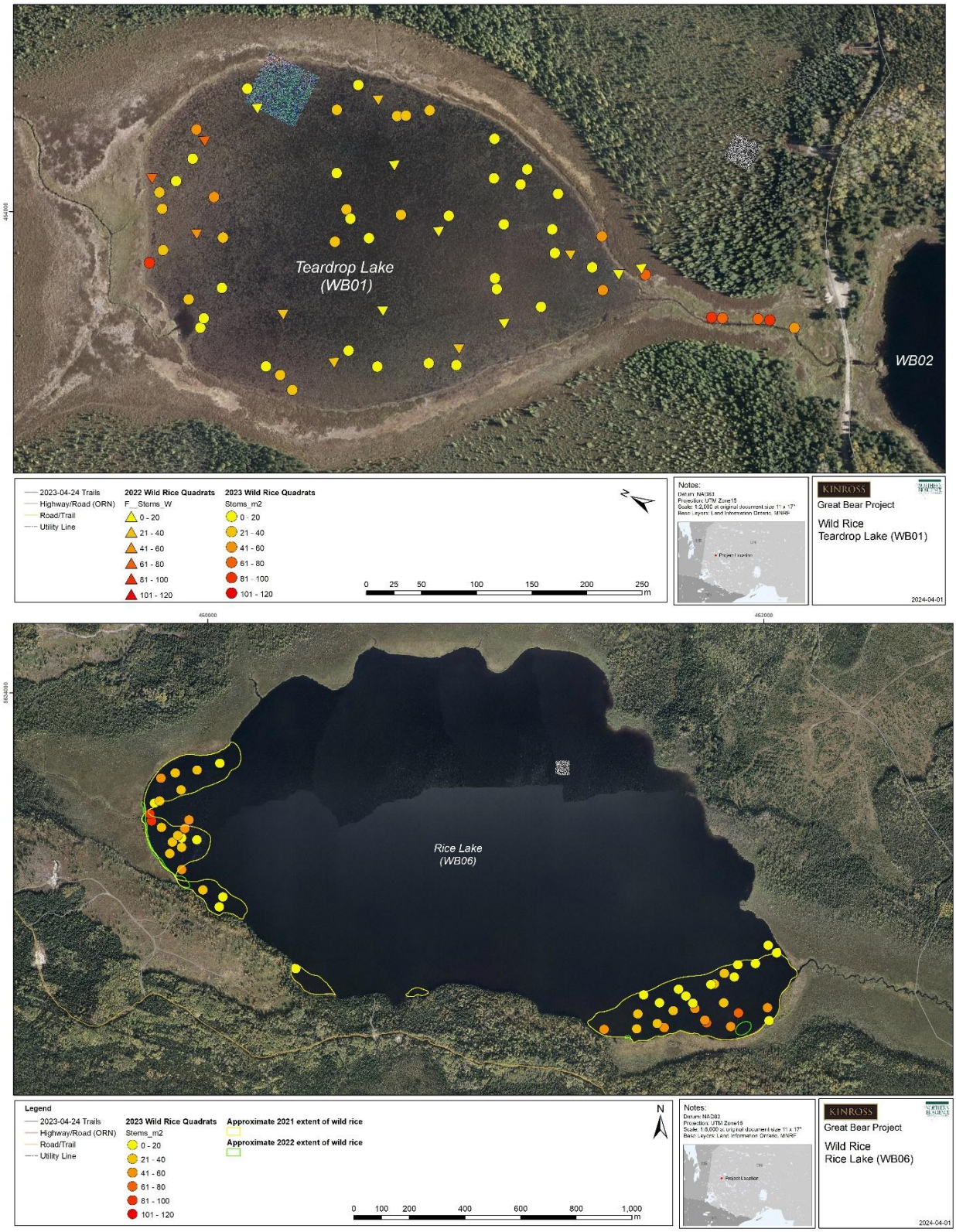


Figure 29. Extent and density of wild rice on Teardrop and Rice lakes, 2021-2023.

Figure 30. Teardrop Lake, September 6, 2023.

Figure 31. Rice Lake, September 7, 2023.

Figure 32. East end of Rice Lake (WB06), looking west.

Figure 33. West end of Rice Lake (WB06), looking west.

Figure 34. Wild rice on Teardrop Lake (WB01), October 10, 2022.

Figure 35. Wild rice on Teardrop Lake (WB01) on September 5, 2023, looking north.

4.1.4.2 Adjacent Landscape

The September 5, 2023, aerial survey covered about 180 km and included 74 lakes, ponds, and segments of rivers and streams (Figure 4). Wild rice was observed on five waterbodies including Dixie Creek, Hiewall Lake (Figure 38), an unnamed lake southeast of Hiewall Lake, Rice Lake, and Teardrop Lake.

All five of the waterbodies with wild rice were in the eastern part of the aerial survey area associated with lacustrine plain and ground moraine landforms and deeper soils (Neilson 1989). In contrast, the western part of the aerial survey area, where wild rice was not observed, has shallower soils and exposed bedrock.

On Dixie Creek (Figure 37), rice occurred in a band 2-10 m wide on both sides of channel for at least 3 km upstream from Dixie Lake. No rice was visible on Dixie Lake itself. Wild rice on both Hiewall Lake (Figure 4). and the unnamed lake is confined to a few patches on the west side and cover less than 1 ha and about 4 ha respectively. Wild rice is distributed throughout Teardrop Lake and concentrated on east and west ends of Rice Lake.

Sparse rice was observed in the lower Dixie Creek above its junction with the Chukuni River during the boat survey on September 2023, 2023. There was less than 1 ha of rice, most of it within 600 m of the confluence (Figure 36). Most was in a narrow 2-5 m band along the banks, associated with floating leaved burreed and pondweeds.

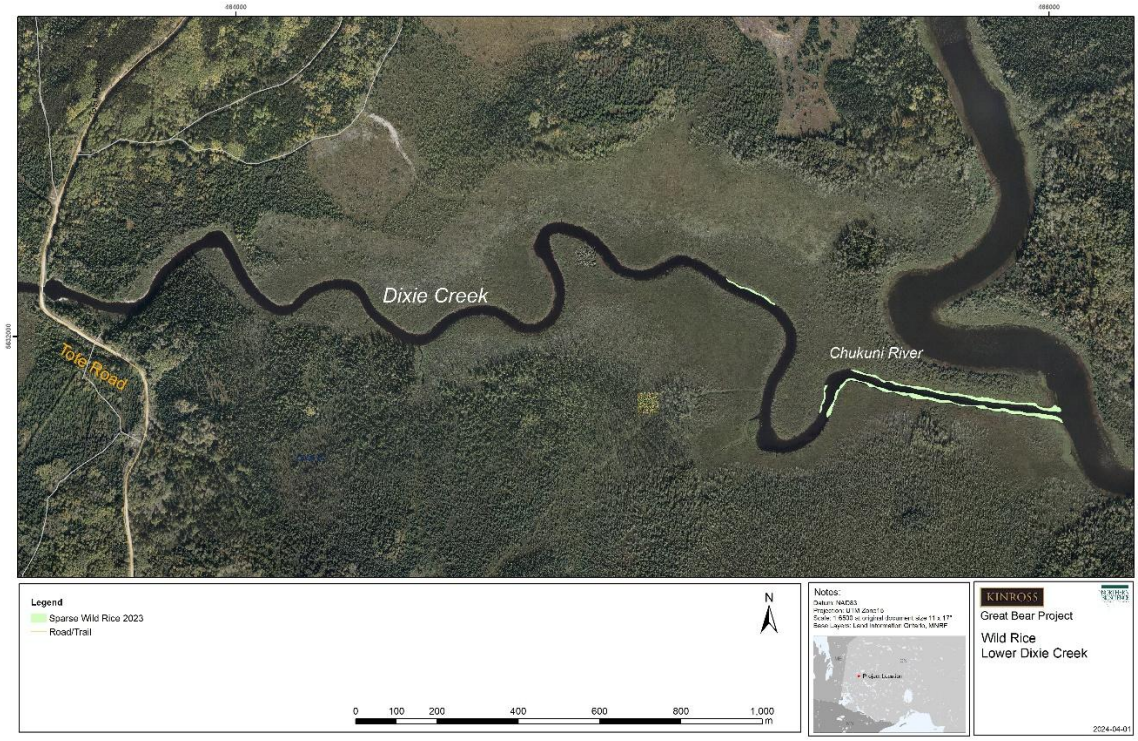


Figure 36. Wild rice observed in Dixie Creek near its mouth at the Chukuni River.

No rice was observed nor on the Chukuni River system between Pakwash Lake and Gullrock Lake despite an abundance of marshy habitat. Potential habitat where no rice was observed is at Dixie Lake, the Chukuni River, and an unnamed lake 2.5 km west of Genessee Lake (UTM coordinates: 15 U 447911E 5636673N). These are potential sites for establishing a compensation rice population, but fieldwork is required to confirm depth, substrate, competition, and other characteristics.

Figure 37. Dixie Creek upstream of Dixie Lake with a band of wild rice on both sides of channel.

Figure 38. Hiewall Lake where wild rice was observed, September 2023.

4.1.5 Upland Non-forested Communities

Not including the open wetlands discussed above, the remaining non-forested communities include rock barrens, talus, cliff/rock face, and anthropogenic habitats such as hydro transmission lines and gravel pits. As per the provincial ecological land classification (ELC) system, these open communities typically have than <25% cover of trees[6]. Terrestrial non-forested communities account for approximately 60 ha or less than 1% of the property (Table 2,Table 3), although most if this are active aggregate pits along Tuzyk's Road.

Individual patches of rock barren (B164, B165) are generally small (i.e., <100 m^2) and scattered throughout the northern portion of the AOI, typically associated with shallow soils over bedrock and steep relief. Most are too small to be delineated individually in the FRI. Typical vascular plant species include common juniper (*Juniperus communis*), bearberry (*Arctostaphylos uva-ursi*), and three-toothed cinquefoil (*Sibbaldia tridentata*), with scattered pin cherry (*Prunus pensylvanica*), jack pine (*Pinus banksiana*), and balsam fir (*Abies balsamea*)(Figure 39). No rare plant species or community types were observed in this ecosite, but it could potentially be suitable for winter habitat for woodland caribou due to the abundance of *Cladonia* (*Cladina*) ground lichens ("reindeer moss").

Large cliffs are absent from the AOI, but there are some rock faces despite the rounded nature of the bedrock domes. Most rock faces are small (i.e., 3-5 m in height) (Figure 39 and are often forested to the upper rim and along the base. North-facing cliffs tend to have cooler and moister than average microclimates, and often support a dense carpet of mosses and often a rich herbaceous and shrub (e.g., mountain maple *Acer spicatum*) community at the base. Ferns such as fragrant cliff fern (*Dryopteris fragrans*), fragile fern (*Cystopteris fragilis*), *Woodsia* spp., and club mosses (Lycopodiaceae) are common in cracks and ledges on the bedrock faces, along with scattered sedges (e.g., *Carex canescens*), mosses, and lichens.

Talus slopes are generally too small to be typed individually in the FRI, which typically have a minimum polygon size of at least 5 ha. Talus slopes are found at the base of cliffs or very steep slopes including one to the north of Genessee Lake (Figure 40). Talus communities are typically dominated by lichens such as *Peltigera* and *Cladonia* in xeric, open conditions, but with more moss cover (e.g., *Pleurozium, Ptilium)* in moister shaded conditions. Vascular plants are less abundant and not diverse; rock polypody (*Polypodium virginianum*) and rusty woodsia (*Woodsia ilvensis*) are common species, with stunted white birch (*Betula papyrifera*) as the main overstory species. No rare species or vegetation species were associated with this ecosite, but it could potentially provide denning habitat for wolverine. There were also several occurrences of raised cobble/boulder beaches in the north of the property (Figure 40), which likely represented the historic shoreline of glacial Lake Agassiz. They have a xerophytic plant, moss, and lichen community similar to those found on rock barrens and dry rock faces.

Approximately 13 ha of human-modified habitat is found on the property and primarily includes the transmission line right-of-way (ROW) (Figure 41) that passes in the north of the property roughly parallel to Highway 105. The ROW is dominated by grasses and other graminoids, and early successional weedy species, as well as remnant survivors of the original forest floor such as bunchberry and blueberries (*Vaccinium* spp.). The vegetation is believed to be kept in an early successional, open state by active vegetation management (e.g., herbicide spraying and brush-saw) at regular intervals.

For cliff and cliff rim, talus slopes, rock barrens, and sand dunes to qualify as SWH in Ecoregion 3W, they must have provincially rare species or plant communities. No S1-S3 plant species or communities were observed in these habitats in the AOI (see *4.2 Flora)* and therefore none of the non-forested upland ecosites comprised SWH. No highly diverse areas or arctic-alpine communities exist in the AOI that would constitute SWH either.

[6] larger than 10 cm diameter at breast height and/or greater than 2 m tall

Figure 39. Rock barren (right) and cliff (right) communities at the Great Bear property.

Figure 40. Talus (left) and raised beach shoreline (right) at the Great Bear property.

Figure 41. Anthropogenic ecosites in the AOI include existing transmission line right-of-way.

4.2 Flora

A total of 331 species of vascular plants have been documented in the Great Bear Project study (Appendix 19). See *9.1.1 Black Ash* for a discussion of black ash (*Fraxinus nigra*), the only federally or provincially listed vascular plant SAR whose range potentially overlaps the AOI. The presence of provincially rare (S2) floating marsh marigold (*Caltha natans*) was confirmed in 2022 from the Great Bear property. No other provincially or federally rare plant species are known from the AOI.

A total of 42 non-native species have been observed in the Great Bear Project AOI. This represents approximately 12% of the species documented thus far in the Project AOI; in comparison, approximately 38% of the known species in Ontario are considered non-native (NHIC unpublished data). Non-native species were most abundant along trails and road such as clovers (*Trifolium* spp.), common dandelion (*Taraxacum officinale*), oxeye daisy (*Leucanthemum vulgare*), common plantain (*Plantago major*), and little yellow rattle (*Rhinanthus minor*), many of which typically do not invade natural communities. Milkweed (*Asclepias* spp.) has not been observed in the AOI; it is the obligate host plant for SAR monarchs.

4.2.1 Provincially Rare Plants

Only two species of provincially rare plants have been observed to date at the Project AOI. Floating marsh marigold, *Caltha natans* (Figure 42). This S2-ranked species was found at 12 locations within 2 km of each other south of Dixie Creek (Figure 26). It was found in or along still or slow-moving water in streams, beaver ponds, and roadside ditches with muddy, fine-textured substrates. In Ontario, this species is restricted to northwestern Ontario, where its distribution is believed to reflect post-glacial dispersal along the continental ice sheet margin (Harris and Marr 2009). It has been documented from less than 20 Ontario locations previously but is known from the Red Lake area (iNaturalist 2024) and is probably more widespread than previously thought.

Figure 42. Floating marsh marigold observed in roadside ditch south of Dixie Creek, August 2022.

Two occurrences of Hooker's (*Platanthera hookeri*) (S3) were observed in conifer forest east of Tote Road. This species, with its distinctive round basal leaves and green inflorescence (Figure 43), is typically found in dry upland forests, often on sandy soils under jack pine, but also moister soils under trembling aspen, white birch, white spruce, or balsam fir; more rarely it is found in lowland black spruce with *Sphagnum* or feathermosses (Smith 2012). It appears to be declining across its range (Oldham and Brinker 2009; Reddoch and Reddoch 2007).

Figure 43. Hooker's orchid observed east of the Tote Road.

Although not provincially rare, observations of the following species at the GBR property are notable since they are near the limit of their broad ranges in Ontario (iNaturalist 2024; Soper and Heimburger 1982):

- Western poison ivy (*Toxicodendron rydbergii*),
- Clammy hedge-hysspop (*Gratiola neglecta*),
- Cyperus sedge (*Carex pseudocyperus*),
- Wild ginger (*Asarum canadense*), and
- Greater duckweed (*Spirodela polyrhiza*).

4.2.2 Provincially Rare Plant Communities

No provincially rare plant communities as identified by NHIC were observed in the GBR AOI.

Stands with significant American elm (*Ulmus americana*), black ash (*Fraxinus nigra*), bur oak (*Quercus macrocarpa*), red pine (*Pinus resinosa*), and white pine (*P. strobus*) can qualify as SWH[7]. A small number of American elm individuals is located along the north shore of Rice Lake (WB04) in association with black ash (Figure 26). At least 15 saplings from 0.3 to 5 m tall are present, as well as one 15 m tall tree (10 cm DBH). Some bigger dead trees up to approximately 10 cm DBH are also present. The elm seem to be preferentially targeted by beaver, with numerous cut stumps. These trees are near the documented northern limit of the distribution of American elm in Ontario (Hosie 1979; iNaturalist 2024; Kershaw 2001). Dutch elm disease, an invasive, highly infectious fungal disease spread by bark beetles, is present throughout the range of elm in Ontario (OMNRF 2024a).

No native bur oak, white pine, or red pine are found on the GBR property; the red pile to the north of the property along Hwy 105 have been planted.

See discussion of Endangered black ash in *9.1.1 Black Ash*

4.3 Fungi

Fungi were documented opportunistically in conjunction with other fieldwork in 2021-2023. A total of 77 species of fungi were observed, including 55 Basidiomycota, 22 Ascomycota, and one Zygomycota (Appendix 22). Fungi, including lichens, have a significant role as decomposers in the boreal forest (Barron 1999), and are significant in the diet of many species (e.g., woodland caribou, northern flying squirrel). In addition, they may have significance for traditional Indigenous use e.g., chaga (*Inonotus obliquus*), as well a community harvest (mushroom pickers).

[7] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

5 MAMMALS

At least 36 species of mammals have been confirmed using the Great Bear Project AOI in 2021-2022 (Appendix 23). Of these, at least 19 were observed on the trail cameras deployed in the AOI; the remaining mammal species were recorded on acoustic recorders (i.e., bats) or observed opportunistically during fieldwork. Approximately 60 species of mammals are known to have occurred in the Thunder Bay District (TBFN 2018), and additional mammal species typical of the southern boreal forest (e.g., Eder 2012; Kurta 2017; Naughton 2012) likely use the AOI but were not detected during fieldwork, in particular insectivores and rodents. Bats and other SAR mammals (i.e., boreal caribou, wolverine) are discussed in *Section 9.2 Mammal SAR*.

Locations of wildlife and sign (e.g., tracks, beds) observed during the February 11-12, 2022, aerial survey are presented in Figure 44 and Appendix 26. A summary of observations is presented in Table 5.

Table 5. Mammal observations from 2022 and 2023 aerial surveys.

Taxon	2022		2023		Total	
	# Locations	# Ind.	# Locations	# Ind.	# Locations	# Ind.
wolverine tracks			1	0	1	0
moose	11	18	15	37	26	55
moose tracks	128	0	42	0	170	0
wolf	2	2	0	0	2	2
wolf tracks	26	0	35	0	61	0
lynx tracks	25	0			25	0
marten/fisher tracks	4	0			4	0
otter tracks	10	0	6	0	16	0
red fox tracks	2	0			2	0
Grand Total	208	20	99	37	307	57

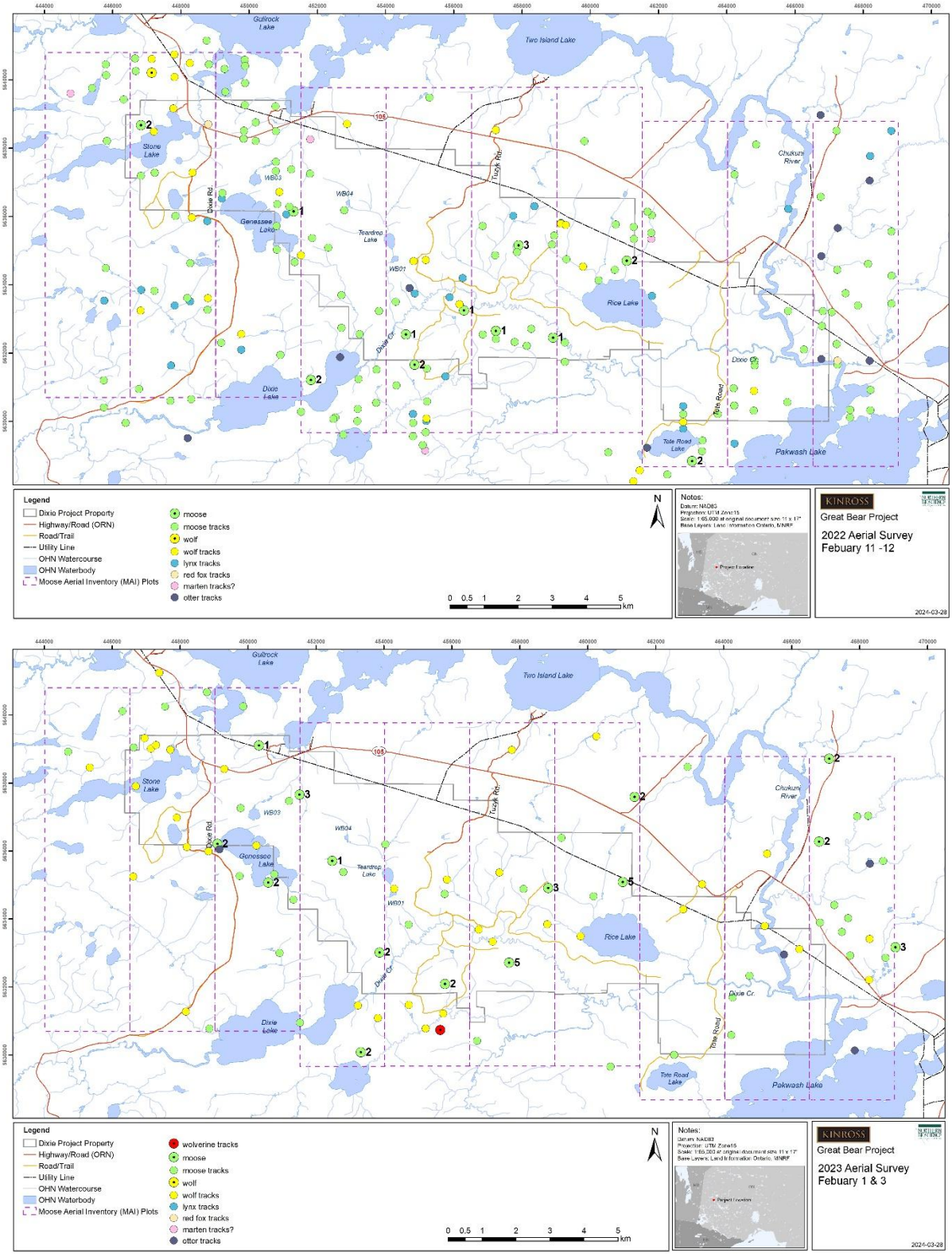


Figure 44. Mammal observations from February aerial surveys conducted in 2022 (upper) and 2023 (lower).

An overall summary of mammals observed by trail cameras from 2021-2024 is presented in Table 6, with summary results from individual trail camera placements provided in Appendix 24. Representative photos from trail cameras are presented in Appendix 25. Snowshoe hare (*Lepus americanus*), gray wolf (*Canis lupus occidentalis*), Canada lynx (*Lynx canadensis*) moose (*Alces alces*), black bear (*Ursus americanus*). red squirrel (*Tamiasciurus hudsonicus*), red fox (*Vulpes vulpe*s) and American marten (*Martes americana*) were the most observed species on trail cameras, with over 100 observations each. Sign (scat, tracks) of these species were also widespread across the AOI along roads and trails, and all have also been observed while conducting fieldwork.

Table 6. Summary of wildlife observed on trail cameras deployed in the GBR AOI, 2021-2024.

Taxon	Total # of Events	Total # of Individuals	Total # of Photos
Snowshoe Hare	220	223	646
Gray Wolf	211	240	589
Canada Lynx	171	171	614
Moose	168	194	664
Black Bear	136	143	694
Red Squirrel	123	125	347
Red Fox	121	124	391
American Marten	116	116	3684
Coyote	39	43	101
Muskrat	36	36	152
unknown animal	32	32	64
Fisher	27	27	220
Striped Skunk	24	24	64
Wolverine	15	15	40
Northern Flying Squirrel	10	10	20
Coyote or Gray Wolf	9	9	27
Porcupine	9	9	26
Short-tailed Weasel	7	7	8
Beaver	6	6	31
American Mink	2	2	2
Eastern Chipmunk	2	2	2
White-tailed Deer	2	2	12
Groundhog	1	1	1
Least Chipmunk	1	1	1
North American River Otter	1	1	3

5.1 Moose

5.1.1 Moose Populations

Moose appear relatively abundant in the Project AOI. A total of 55 moose was observed at 26 locations during the two aerial surveys in 2022 and 2023, with an average of 2.75 moose per MAI plot. Most appeared to be adults, but circling was kept to a minimum to avoid harassment so the sex could not be determined for all individuals. Moose tracks (old and fresh) were abundant in 2022-2023 surveys, often in areas with abundant browse in regenerating cutovers, old burns and along waterways.

5.1.1.1 Cervid Ecological Framework

OMNR's Cervid Ecological Framework (CEF) provides the overarching policy direction for the management of cervids i.e., moose, woodland caribou (*Rangifer tarandus*), white-tailed deer (*Odocoileus virginianus*), and elk (*Cervus elaphus*), at the broad landscape level in Ontario (OMNR 2009b). The CEF establishes cervid ecological zones (CEZs) that establish broad population and habitat management guidance to assist in the setting of local population and habitat objectives at the Wildlife Management Unit (WMU) level. The GBR Project is within Cervid Ecological Zone B (Figure 45), where the broad population management guidance is to:

- minimize impacts and maintain/restore caribou populations as directed by the Caribou Conservation Plan (OMNR 2009a).
- maintain low to moderate density (~0.0-0.4/moose km^2) moose population where appropriate as per species-specific policy direction.
- manage for low density (~0-2 deer/km^2) white-tailed deer population through provincial deer management program.

The density values are broad ranges that apply at the CEZ scale and are not intended as specific WMU density targets but may be used to assist population objective-setting exercises. The broad guidance for habitat management in CEZ B is to emphasize caribou habitat as a primary management consideration, emphasize moose habitat where appropriate as per species-specific policy direction, and not to emphasize deer habitat management. While intended as broad management units based upon ecological considerations, WMUs are not strictly ecological units; many WMUs follow anthropogenic boundaries such roads and railways that are easy for hunters to recognize in the field.

Provincial moose population objectives setting guidelines recognize that in areas where caribou are the primary management focus, moose should be managed to a low density of ~0.10 moose/km^2 (OMNR 2009c), providing consistent direction with that from the CCP and the CEF. Within caribou range maintaining low densities of moose and deer that reflect natural ecological conditions is consistent with managing the wildlife community and current provincial caribou and moose policy direction (OMNR 2013c). For CEZ B the objective is to maintain a "low to moderate density population" (OMNRF 2024b). The GBR Project is located within WMU 3, which encompasses 12,492 km^2 (Figure 45). OMNRF's 2024 population estimate for WMU 3 is 2202 moose, which represents a density of 17.6 moose/100km^2. This density is within the upper and lower 2030 population objectives for WMU 3, which are 1900 (15.2 moose/km^2) and 2500 moose (20.0 moose/km^2) respectively. Current moose density in WMU 3 is also within the 0.0 to 0.4 moose/km^2 range identified for CEZ B. Based on the 2022-2023 surveys, there is an estimated density of 11 moose per 100 km^2 (0.11 moose/km^2) in the GBR AOI, which is in line with the CEZB objective but lower than the WMU 3 objective.

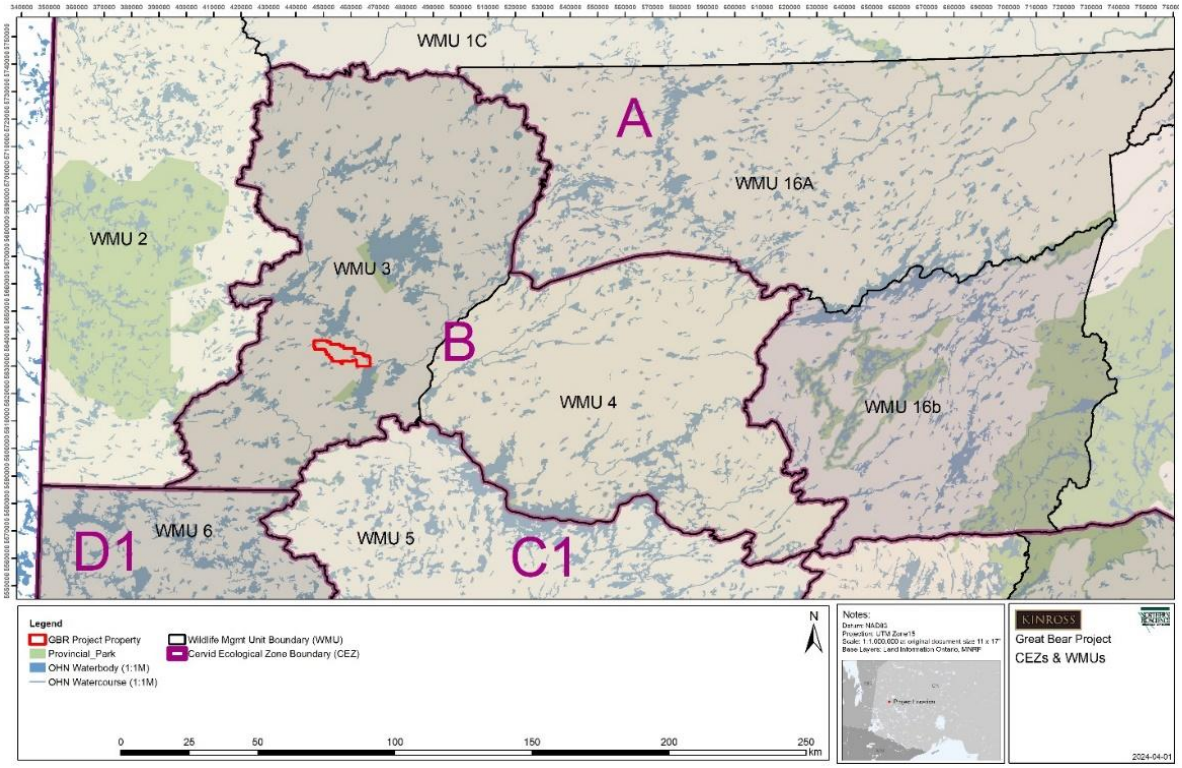


Figure 45. Wildlife Management Units (WMUs) and Cervid Ecological Zones (CEZs) in relation to the GBR Property.

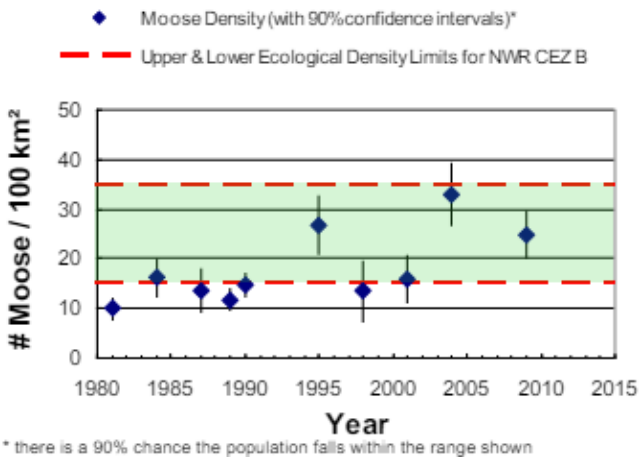


Figure 46. Moose density trends in Wildlife Management Unit 3 (OMNRF 13b).

5.1.2 Moose Habitat

Moose have varying habitat requirements throughout the year. Early winter habitat is primarily made up of mature or over-mature, open canopy, mixedwood stands with less than 60% tree cover, as well as areas that had been 5-25 year-old burns and cutovers (OMNR 2013c). Late winter habitat consists of denser stands of mature conifer with good overhead cover; mixed stands made up of less than half mature conifer should also be considered as late winter habitat if pure conifer stands are not available. Upland sites are preferred. Thermal refuge and moose aquatic feeding areas become more important during the summer.

Moose aquatic feeding areas (MAFAs) are areas of shallow lakes, slow-moving rivers, shallow bays of deep lakes, and beaver ponds where moose forage in the spring on submerged and floating aquatic plants that are rich in sodium. In forest management planning, there is often preferential retention of residual shoreline forest adjacent to MAFAs, however this is not required in areas managed for woodland caribou. No MAFAs are identified for the GBR AOI in the Red Lake FMP (Partridge 2020). Category 3 and 4 MAFAs can be considered SWH[8]. Category 3 & 4 MAFAs are generally areas >1 ha that are accessible to moose and have at least 50% cover of preferred species e.g. water lilies (*Nymphaea, Nuphar*), pondweeds (*Potamogeton filiformis, P. foliosus*), marestail (*Hippuris vulgaris*) and water milfoils (*Myriophyllum*) (Fraser et al. 1984; Ranta 1998). Although there are some areas in the GBR AOI with these floating-leaved and submergent aquatic plant species, they are too small and preferred species too sparse to be considered Class 3 or 4 MAFAs. There may be some Class 1 or 2 MAFAs on the west end of Rice Lake (WB04) as well as other smaller waterbodies, including beaver ponds.

Moose may meet some of their annual sodium requirements by consuming muddy water found in mineral-rich springs, called mineral licks and can therefore be important components of habitat for moose (OMNR 2010). No natural mineral licks were observed during 2021-2023 fieldwork nor are any documented in the GBR AOI in the Red Lake FMP. Mineral licks are considered SWH, but roadside licks that result from the accumulation of ponded salty runoff along roadsides (such as observed at several locations along Highway 105 during 2022-2023 fieldwork), are not considered SWH.

According to OMNR (2013), landscape habitat analysis modelling estimates the overall mean carrying capacity for in WMU 3 as approximately 15 moose per 100 km^2 based on the availability of dormant season, (early and late winter) browse, growing season forage (i.e., browse and aquatic feeding areas), and both dormant and growing season cover. Based on 2021-2023 aerial surveys, there is an estimated density of 11 moos/100^2 in GBR AOI. Moose habitat modelling for the AOI using OWHAM is presented in Appendix 27.

No cervid movement corridors are documented for the GBR AOI (e.g., in the FMP) nor observed during field surveys.

5.2 White-tailed Deer

White-tailed deer are near the current northern limit of their Ontario range in the Red Lake area, where cold winter temperatures and snow depth are likely limiting factors (Kennedy-Slaney 2018; Ranta and Lankester 2017). Most deer observations appear to be concentrated near the community of Red Lake (iNaturalist 2024). Deer were not detected on the GBR property during aerial surveys but were detected on two trail cameras. One doe was detected on June 9, 2022 at Trail Camera 300a deployed approximately 1 km (Figure 47) and another was detected in June 24, 2023 at TC003 on the shoreline of Waterbody WB04.The only other sign of white-tailed deer on the was one group of deer pellets was observed during 2022 fieldwork north of Waterbody WB03.

[8] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

Figure 47. White-tailed deer observed on June 9, 2022 at on Trail Camera 300a deployed approximately 1 km south of Waterbody WB01.

Figure 48. White-tailed deer observed on June 24, 2023 at on Trail Camera TC-003e deployed at Waterbody WB04 (date on trail camera is in error).

5.3 Black Bear

5.3.1 Populations

Population data on black bear are collected provincially by OMNRF through its Wildlife Assessment Program and some additional data are available from hunter surveys and harvest information. However, no OMNRF is available at the scale of the Project site. Based on trail camera photos (Table 6, Appendix 24) and field evidence (e.g., tracks, scat, signs of foraging), black bears are relatively widespread and abundant in the Project property.

5.3.2 Habitat

Black bears are found in a broad range of forested habitats, particularly dense mixedwood and hardwood forests (Obbard et al. 2010). Habitat preference is in large part dependent on cover and available food sources. Plant material typically makes up most of their diet, including emerging green grass, forbs, flowers, fruits, and roots (Naughton 2010 and references therein). Berries (e.g., blueberries, raspberries, chokecherry, pin cherry, dogwoods) and nuts (e.g., beaked hazel) are particularly important for accumulating adequate fat reserves for hibernation. Blueberries are locally abundant in the GBR property, particularly along the transmission line ROW, young cutovers, and on rock barrens. Downed woody debris and loose rocks can be important habitat components since insects (e.g., ants, beetle larvae) may be a critical source of protein for black bears because their mainly herbivorous diet is otherwise low in protein (Obbard et al. 2010). Black bears will also consume a broad variety of small mammals, fish, carrion, and ungulate calves where available (Franzmann and Schwartz 1997; Naughton 2012).

Black bear habitat modelling is presented in Appendix 27.

5.4 Gray Wolf

5.4.1 Gray Wolf Populations

Wolves were commonly observed on trail cameras (Table 6, Appendix 24), several were observed during aerial surveys (Table 5), and during ground-based fieldwork. Based on location of sightings, as well as colour and size of observed individuals (e.g., Appendix 25), the AOI overlaps the home range of at least one pack of wolves in 2022-2023.

Population data on wolves are not collected consistently by OMNR across Ontario. The only available information on wolf populations from the Project AOI are from furbearer harvest, hunter questionnaires, and aerial surveys for moose and/or caribou, none of which are currently available from the OMNRF.

5.4.2 Gray Wolf Habitat

Wolves range broadly across the Holarctic and inhabit a wide range of forested and open habitats (Naughton 2012). No wolf habitat model is currently supported by OMNRF for Ontario often associated typically in well-drained sandy soils, often associated with upland ridges (Ballard and Dau 1983; Mech 1970), including pine forests in parts of Ontario (Norris et al. 2022). One inactive den (see *3.3.3 Specialized Habitat for Wildlife*) was found north of the existing transmission ROW and field observations of wolf pups in 2022 and 2023 indicate that the AOI includes the home range of at least one pack.

The primary prey of wolves in the Project AOI likely include moose (Figure 49), beaver, and other mammals (Naughton 2012), and predation by wolves can have a significant impact on boreal caribou (see *9.2.1 Boreal Caribou*).

Figure 49. Grey wolf (arrow) chasing moose at Trail Camera #50.

5.5 Beaver

5.5.1 Beaver Populations

Quantitative data on beaver populations in Ontario are not routinely collected by OMNRF, but trapper harvest data provides some information on their abundance. However, fur harvest data was not available from OMNRF for the Project area either at the trapline level or a summary for the Red Lake District due to confidentiality issues. Based on sightings of individual beavers as well as their lodges, dams, and cut stumps (Figure 50), this species is relatively widespread and abundant across much of the GBR property. Beaver lodges (active or inactive) were found on all major waterbodies on the property in 2021-2023, with beaver activity found along most large stream systems as well. There are approximately 50 waterbodies entirely or partially overlapping the GBR property and approximately 8 km of Dixie Creek and 1 km of Stone Creek on the property, as well as more than 80 km smaller[9] tributaries on the GBR property, much of which represents or is near potential beaver habitat.

[9] Single line, rather than a polygon feature, in the Ontario Hydrological Network geodatabase

Figure 50. Beaver walking along Tuzyk's road near the existing transmission ROW, June 2022 and active lodge on Dixie Creek.

5.5.2 Beaver Habitat

Beaver habitat modelling is presented in Appendix 27. Habitat suitability for beaver is quite variable on the GBR property, reflecting varied terrain, hydrology, and forest composition. Approximately 2774 ha on the GBR property is potentially suitable for beaver according to OMNRF models.

5.6 Other Furbearers

5.6.1 Furbearer Populations

The Project AOI supports a number of ecologically and economically important furbearers in addition to gray wolf and beaver discussed previously. Tracks of lynx, otter, and other furbearers were also observed during aerial surveys (Table 5, Figure 44). Although no animals were seen, the distinctive tracks of river otter were observed along or near watercourses and waterbodies, and sometimes at some distance indicating overland travel between watersheds. Tracks of smaller furbearers such as American marten and red fox were not consistently recorded during aerial surveys but appeared relatively abundant where habitat was suitable. Apart from wolves, furbearers were occasionally observed on trail cameras, including Canada lynx, marten, fisher, otter, and red fox (Table 6, Appendix 24).

Although trail cameras provide an indication of relative abundance in the population area, absolute abundance data are not available. Fur harvest data compiled by OMNRF provide quantitative information on the number of animals harvested, but these are dependent on trapper success, which is turn driven by a complex interplay of effort, access, fur prices, and other socioeconomic factors, rather than just population levels of target species. Due to privacy concerns, trapper harvest data at the trapline level are not publicly available. In Ontario, muskrat, was the most trapped species from 1993-2022, followed by beaver, American marten, raccoon, and American mink. Raccoons are absent from the GBR Project area, and both muskrat and mink are likely less commonly trapped in the Project area than the provincial records would indicate.

5.6.2 Furbearer Habitat

Ontario furbearers use broad range of habitats depending on the species and landscape. Beaver habitat was modelled (see *5.5.2 Beaver* Habitat) as a representative aquatic/riparian furbearer. Habitat for American marten was similarly modelled using OWHAM as a representative forest-dwelling furbearer. Together with beaver, marten is the most trapped furbearer in much of Ontario (OMNRF unpublished data), most likely including the Project area as well. Marten habitat modelling is presented in Appendix 27; approximately 101 ha of potentially suitable habitat for marten is available on the GBR property, scattered in patches of mature conifer forest primarily.

5.6.2.1 Furbearer Dens

Dens of the following mammals, all furbearers, are considered SWH in Ecoregion 3W: American mink, North American River otter, gray wolf, coyote, Canada lynx, bobcat, black bear, red fox, American marten, and fisher. No active furbearer dens were observed during 2021-2023 fieldwork, including the inactive wolf den discussed previously.

5.6.2.2 Furbearer Movement Corridors

Furbearer movement corridors can be considered SWH[10]. None are documented for the GBR AOI nor observed during field surveys. Dixie Creek could potentially be used as a movement corridor in the ice-free seasons by semi-aquatic furbearers such as beaver, muskrat, American mink, and river otter. Other furbearers may use it during the winter once solid ice has formed. A trail camera deployed at the bridge over Dixie Creek south of the main drilling area showed some use by coyote, Canada lynx, river otter, and other furbearers but not likely to the degree that it would qualify as a significant wildlife habitat.

5.6.3 Other Mammal Species

Snowshoe hare tracks were commonly observed during aerial surveys, and evidence of their presence (e.g., pellets) was commonly observed during fieldwork. Approximately 816 ha of potential suitable habitat for snowshoe hare on the GBR property is present according to OMNRF habitat models. Red squirrels were ubiquitous in conifer-dominated forests. See Appendix 23 for a summary of other mammal species observed or likely to be present in the Project area.

6 BIRDS

6.1 General

A total of 155 bird species were observed at the Great Bear Project AOI in 2021-2023 (Appendix 30), of which at least several (e.g., Townsend's solitaire, snow goose) are migrants that do not breed in the Red Lake area. Additional breeding species may be expected to occur in the AOI based on known distributions (e.g., Cadman et al. 2007; eBird 2022; iNaturalist 2022), typically rarer or more cryptic species. In comparison, during the last Ontario Breeding Bird Atlas (OBBA), a total of 154 species were recorded during ~700 survey-hours in the 100 km^2 block 15VS that overlaps the Project AOI (BSC et al. 2006). Portions of four 10 x 10 km atlas squares overlapped with the Project property, and additional squares overlap possible transmission line rights-of-way that were assessed for the Project. A total of 431 observations of 36 bird species was detected on trail cameras, of which the most common were mallard,

[10] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

Canada jay, common raven, sharp-tailed grouse[11], and ruffed grouse (Appendix 32). The only species detected solely on trail cameras were the eastern bluebird and double-crested cormorant.

6.1.1 Partners in Flight (PIF)

Partner in Flight's (PIF) "Watch List" includes the 86 species of highest conservation concern at the continental (range-wide) scale (Rosenberg et al. 2016). Seven Watch List species were confirmed from the Project AOI and another species (long-eared owl) potentially occurred in the Project AOI (Appendix 30). Of the seven Watch List species known from the AOI, four are also considered SAR (i.e., Canada warbler, eastern whip-poor-will, evening grosbeak, and olive-sided flycatcher) and are discussed in Section 9.3 Avian SAR. The three remaining confirmed Watch List species include Cape May warbler, Connecticut warbler, and LeConte's sparrow. Connecticut warblers were relatively common in suitable lowland conifer habitat in the Project AOI and were documented on 20 morning point counts. Cape May warblers were less common, found on only 11 point counts. This species is irruptive in nature, with increased abundance in years and areas with spruce budworm (*Choristoneura fumiferana*) outbreaks (Morse 1978). LeConte's sparrow was only observed once during Project surveys, with three individuals documented at a point count (and ARU) on Teardrop Lake in July 2023 (see *6.4 Marsh Birds*, Figure 55). The project is also within the known breeding range of the last Watch List species, long-eared owl, but none were observed during Project field surveys or during the last two OBBA (see *6.3. Owls & Raptors*).

The Project is located within the Ontario portion of Bird Conservation Region (BCR) 8: Boreal Softwood Shield (Figure 51). Of the 229 regularly occurring bird species in BCR 8 ON, almost a third (71) are considered "Priority Species" (Environment Canada 2014a). Priority species are those that are of conservation concern and vulnerable due to population size, distribution, population trend, abundance and threats. Priority species also include some "stewardship" species (Rich et al. 2004) with stable populations or for which no specific conservation issues have been identified, but which depend on BCR 8 ON to such an extent that the region has a high responsibility for their protection. Species of management concern are also included as priority species when they are at (or above) their desired population objectives and require ongoing management because of their socio-economic importance as game species or because of their impacts on other species or habitats. Of the 71 Priority bird species identified for BCR 8 ON, 61 are known from the Project AOI, including 43 landbirds, 9 waterfowl, 9 waterbird, and 3 shorebirds (Appendix 30).

See *9.3 Avian SAR* for discussion of avian SAR.

[11] Trail camera TC-025a was deployed at a sharp-tailed grouse lek

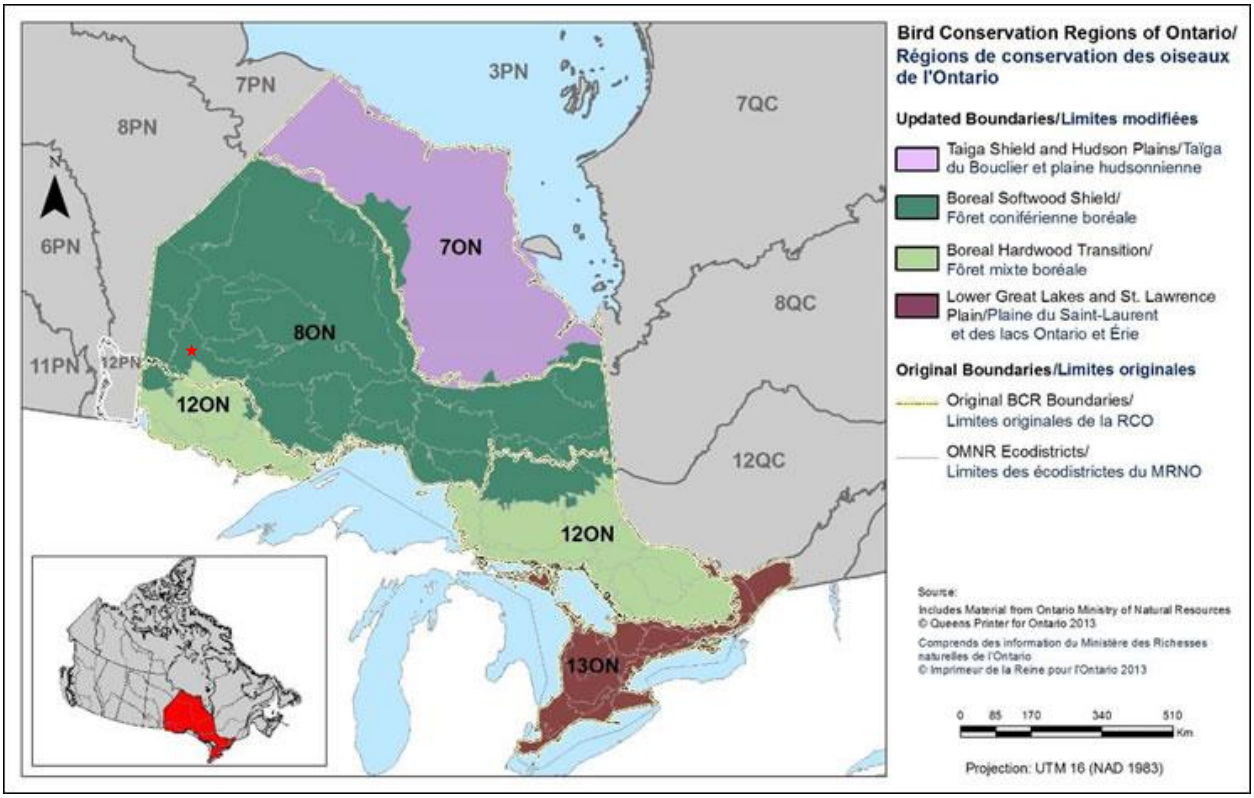


Figure 51. Approximate location of GBR Project (red star) in relation to Boreal Conservation Region 8 (modified from Environment Canada 2014a).

6.2 Songbirds

Passerines and other songbirds were primarily surveyed using morning point counts, with additional incidental records during other bird surveys and general fieldwork. At least 131 bird species were detected on morning point counts in 2022-2023, including 8 species that were only observed flying overhead (typically non-passerines). Species detected on morning point counts (primarily by ear) were typical of the area's boreal forest avian community, with Nashville warbler, white-throated sparrow, red-eyed vireo, ovenbird, and ruby-crowned kinglet the five most common species, both in terms of number of plots on which they were observed and the total number of individuals (Table 7)(Appendix 31).

Table 7. The 25 most common bird species (2022-2023 pooled) recorded on morning point counts for the Great Bear Project AOI.

Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Plots	Total # Observed on Point Counts (Plot + Flyover)
Nashville Warbler	*Oreothlypis ruficapilla*	NAWA	863	1449	1449
White-throated Sparrow	*Zonotrichia albicollis*	WTSP	703	1267	1269
Red-eyed Vireo	*Vireo olivaceus*	REVI	634	952	958
Ovenbird	*Seiurus aurocapilla*	OVEN	581	930	932
Ruby-crowned Kinglet	*Regulus calendula*	RCKI	444	565	567
Chipping Sparrow	*Spizella passerina*	CHSP	364	461	467
Magnolia Warbler	*Setophaga magnolia*	MAWA	355	445	446
Hermit Thrush	*Catharus guttatus*	HETH	303	412	413
Tennessee Warbler	*Oreothlypis peregrina*	TEWA	263	338	338
Yellow-rumped Warbler	*Setophaga coronata*	YRWA	256	283	284
Mourning Warbler	*Geothlypis philadelphia*	MOWA	233	309	311
Swainson's Thrush	*Catharus ustulatus*	SWTH	224	287	288
Common Raven	*Corvus corax*	CORA	223	254	310
Golden-crowned Kinglet	*Regulus satrapa*	GCKI	215	249	249
Blue Jay	*Cyanocitta cristata*	BLJA	213	262	274
Alder Flycatcher	*Empidonax alnorum*	ALFL	206	326	326
Red-breasted Nuthatch	*Sitta canadensis*	RBNU	200	226	226
American Robin	*Turdus migratorius*	AMRO	188	223	229
Northern Flicker	*Colaptes auratus*	NOFL	188	202	212
Dark-eyed Junco	*Junco hyemalis*	DEJU	179	221	222
Chestnut-sided Warbler	*Setophaga pensylvanica*	CSWA	168	220	221
Least Flycatcher	*Empidonax minimus*	LEFL	165	267	267
Winter Wren	*Troglodytes hiemalis*	WIWR	164	180	180
American Crow	*Corvus brachyrhynchos*	AMCR	154	191	204
Black-capped Chickadee	*Poecile atricapillus*	BCCH	148	184	184

6.2.1 Songbird Densities

Predicted densities of 97 breeding bird species on the GBR property are provided in Appendix 32. Based on observed breeding bird densities for the AOI, updated bird density models available from the Partners in Flight Program (Blancher et al. 2007, 2017), it is predicted that 85,159 birds of these 97 species are found in the AOI for an approximate total density of 9.9 birds/ha or 494 pairs/km^2. The current value is within the range (200-600 pairs/km^2) reported by Erskine (1977) for aspen and birch dominated stands in boreal forest region of Canada. The highest densities on morning point counts were recorded for golden-crowned kinglet, Nashville warbler, red-eyed vireo, white-throated sparrow, and chipping sparrow; these are common birds in the boreal forest.

The Project is located within Bird Conservation Region (BCR) 8: Boreal Softwood Shield (EC 2014). The Partners in Flight Program has identified 71 priority species in the Ontario portion of BCR 8. Densities were calculated for 36 of these species (Appendix 32); other priority species have been observed at or near the Project but are species that cannot be effectively surveyed by morning point counts (e.g., waterfowl, raptors, shorebirds) and therefore no densities were calculated. Most of these priority species are relatively abundant in the Project study area; those that are of heightened concern (e.g., federally or provincially listed) are addressed in *9.3 Avian SAR*.

6.2.2 Open Country Bird Breeding Habitat

Open country can be considered significant wildlife habitat for breeding birds. However, there are no large natural or cultural fields or meadows at the Project site and therefore no significant breeding habitat for open country birds, with the transmission line ROW the potential exception. Apart from a migrant short-eared owl and northern harrier, none of the target open country species (i.e., vesper sparrow, LeConte's sparrow, savannah sparrow) were observed or documented for the site in 2022. It is not known at this time whether any open country habitats at the Project property would qualify as provincially significant as breeding habitat.

6.2.3 Shrub/Early Successional Bird Breeding Habitat

Shrub and early successional habitats can be considered significant wildlife habitat for breeding birds in some ecoregions. There appear to be no large (>30 ha) natural field areas succeeding to shrub and thicket habitats in or near Great Bear Project AOI. Although two of the target species (i.e., ruffed grouse, American woodcock) were detected at in 2022-2023, there is no evidence of use or breeding by any of the other target species (clay-coloured sparrow, field sparrow, eastern kingbird). Given the abundance of early successional habitats resulting from forest harvesting and wildfire in Ecoregion 4S, until criteria schedules are developed for this ecoregion, it is unclear whether any would qualify as provincially significant as breeding habitat, however[12].

6.3 Owls & Diurnal Raptors

A total of seven species of owls have been documented in the Project AOI (Appendix 30). Five species of owls i.e., northern saw-whet, boreal, barred, great-horned, and great gray, were heard during nocturnal surveys in 2022-2023 (Appendix 33); most of these were also detected in the Project AOI during ARU deployments in 2022-2023 and likely may breed in or near the AOI. A single northern hawk owl was observed on a mourning point count on June 5, 2022, in a cutover south of Dixie Creek (PC 10-12). Although not vocalizing, it was a possible breeder - this species has been documented nesting in

[12] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

cutovers and burns in northwestern Ontario (Escott 2002, 2007). A short-eared owl was detected during migration on a trail camera along the transmission line ROW east of Tuzyk's road in October 2021 (see *9.3.9 Short-eared Owl*). A great-horned owl and possibly a great grey owl were also detected on trail cameras (TC-065a and TC-069a respectively). Long-eared owls were not detected in the AOI during 2022-2023 fieldwork, nor were any documented for the Project area during the current or past OBBA. There are a few eBird records in the Red Lake area however, so they could potentially breed at or near the Project in some years. With the possible exception of snowy owls migrating south during the winter, no other owl species are expected at AOI based on known ranges (Cadman et al. 2007).

Ten species of diurnal raptors have been observed in the Great Bear AOI, of which the most commonly observed were bald eagle, broad-winged hawk, and American kestrel (Appendix 30). Bald eagles were formerly listed as Special Concern in Ontario, but were downlisted to Not At Risk in 2023, so are discussed here. Bald eagles were frequently observed in the Great Bear AOI in 2022-2023, including paired adults and juveniles. One was observed soaring over Genessee Lake during the February aerial survey indicating that at least some individuals may remain through the winter, potentially foraging at waste disposal sites or other anthropogenic food sources. The use of the area by nesting bald eagles may help explain why only one osprey was observed in the AOI. Broad-winged hawk were most abundant in forested habitats and perched on poles or wires along road corridors; American kestrels were most commonly observed in open habitats. Red-tailed hawks were observed at several locations in 2022-2023 on trail cameras as well. Turkey vultures were observed infrequently soaring overhead,

Several northern harriers were observed in open habitats during migration as well as the breeding season e.g., along the north shore of Waterbody WB01 (Teardrop Lake) during an evening point count on June 10, 2022. They were also detected May 5-11, 2022 along the shore of WB01 by a trail camera (TC-003a). Merlin, northern goshawk, and sharp-shinned hawk were rarely observed, although there is potentially suitable breeding habitat present. No other raptor species are expected to breed at or near the AOI based on known ranges (Cadman et al. 2007), although it is possible that golden eagle, peregrine falcon, and rough-legged hawks may occasionally pass through migration based on eBird reports for the Red Lake area.

Woodland habitat within 25 m to 400 m (depending on species) of an occupied raptor nest is considered significant wildlife habitat in Ecoregion 3W (OMNRF 2017). Nesting in the Project AOI has been confirmed for bald eagle, broad-winged hawk, red-tailed hawk, and sharp-shinned hawk (Figure 52, Figure 54). The bald eagle nests southwest of Rice Lake was active in 2023. Although a bald eagle was observed near the next south of Dixie Creek during the April 2023 aerial survey, it was confirmed as inactive during the May aerial survey and summer fieldwork; this nest was similarly inactive in 2022. The status of all the two nests on Dixie Lake and seven nests along near the Chukuni River were not confirmed, but at least several were active in 2022-2023 (e.g., Figure 54). The Chukuni River between Highway 108 and Two Island Lake could potentially represent SWH as an eagle and osprey concentration area given the number of nests in that area. The open water at the rapids and the likely presence of spawning walleye, suckers, whitefish and other species could represent a significant seasonal foraging area. Sites with >5 individuals and >35 hunting days in either spring, fall, or winter by bald eagles or osprey can be considered significant wildlife habitat.

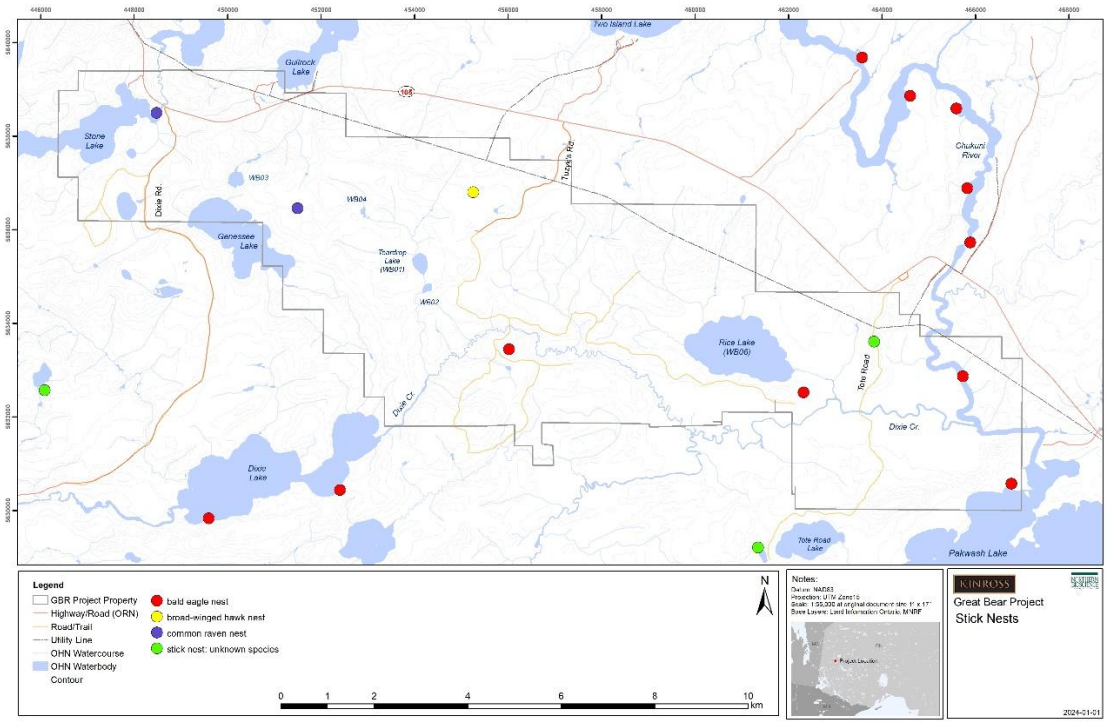


Figure 52. Stick nests observed in the Project AOI, 2021-2023. Red-tailed hawk nest along Highway 105 to southwest of Pakwash Lake not shown.

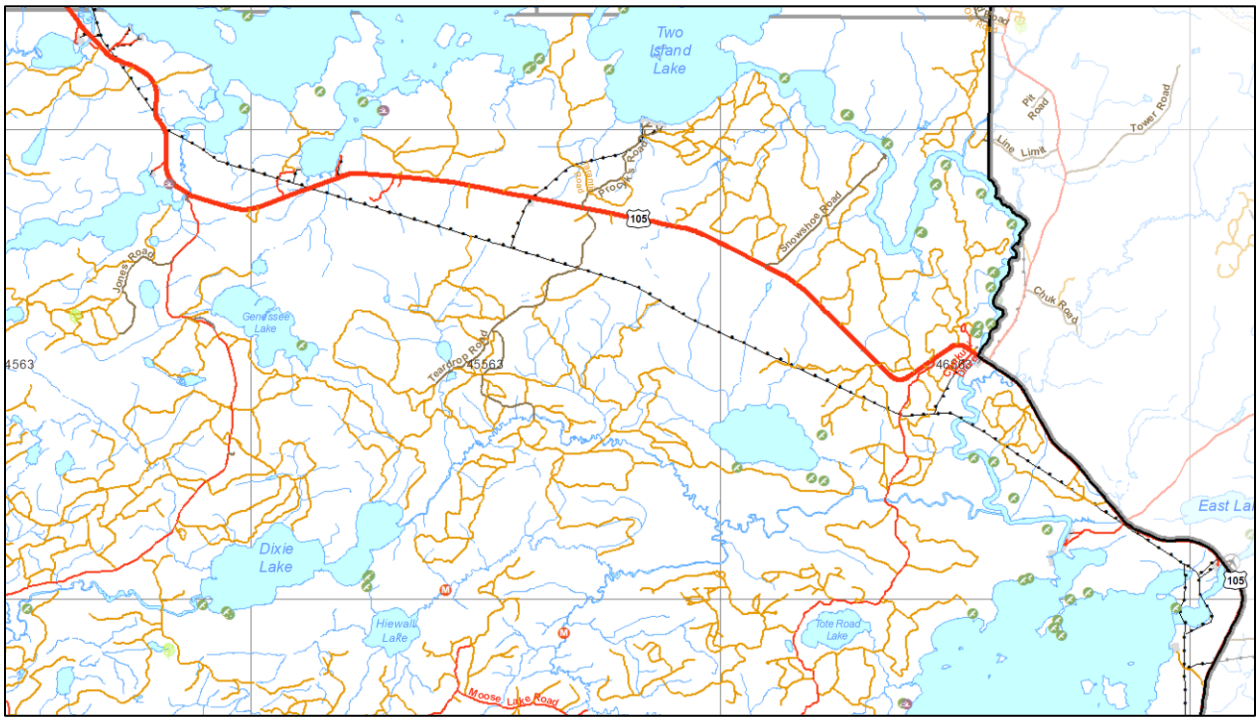


Figure 53. Raptor nests (green symbol) and moose aquatic feeding areas (red M) in the GBR area. Extracted for Red Lake Forest Management Plan wildlife values map (Partridge 2020).

Figure 54. Bald eagle nests south of Dixie Creek (left) and along the Chukuni River (right), and foraging eagle over Rice Lake (centre, L. Spenceley photo).

6.4 Marsh Birds

Marsh birds are a diverse group of species that are dependent on marsh habitats for breeding. A Coefficient of Wetness has been assigned to Ontario birds indicating whether each species is considered wetland-associated (NHIC 2024). A total of 49 wetland-associated bird species of 17 families have been observed in the GBR AOI (Appendix 30). Excluding waterfowl (discussed in *6.5*), a total of 30 species were observed during the main June-July breeding season. See Table 8 for a summary of abundance and distribution of marsh bird species observed during the breeding season. Other marsh birds (e.g., red-necked grebe, horned grebe, pied-billed grebe, trumpeter swan) were only observed in migration. Most species that would be expected to be present based on known ranges and available habitat were detected in 2022-2023 with a few exceptions such as Virginia rail. Relatively low numbers (1-2) of most marsh bird species were observed in the AOI reflecting the relative scarcity of large, well-developed emergent marshes in the AOI. For a discussion of marshes and other wetland habitat, see 4.1.2.

Although not considered a wetland species by NHIC (2024) since they may nest in agricultural, urban, and other non-wetland habitats, in northern Ontario red-winged blackbirds typically nest in large, natural, freshwater marshes (Zimmerling 2007). Although not found in significant concentrations in the GBR study area due to the lack of large marshes (especially cattail marshes), this was nonetheless observed on 55 point counts and is a probable breeder (Appendix 30, Appendix 31).

To qualify as significant marsh breeding habitat in Ecoregion 3W (OMNRF 2017) there must be:

- a breeding pair of trumpeter swan, yellow rail, or black tern, or
- five or more breeding pairs of other marsh species i.e., green-winged teal, northern shoveler, pied-billed grebe, red-necked grebe, Virginia rail, sora, American bittern, sedge wren, marsh wren, ring-necked duck, common loon, spotted sandpiper, or sandhill crane.

Although there were no evidence of breeding for trumpeter swan (see 6.5 Waterfowl & Waterbirds), yellow rail, or black terns, Teardrop Lake and Rice Lake potentially meet this significance criterion based on breeding pairs of other marsh birds.

Table 8. Marsh bird species observed in the Project AOI, during the 2022 and 2023 breeding seasons (i.e., June-July).

Common Name	# PCs[1]	GBR BE[2]	Marsh Bird Notes
American Black Duck		P	see *Waterfowl & Waterbirds*
American Wigeon	4	FY	see *Waterfowl & Waterbirds*
Blue-winged Teal	3	FY	see *Waterfowl & Waterbirds*
Bufflehead	3	H	see *Waterfowl & Waterbirds*
Canada Goose	77	FY	see *Waterfowl & Waterbirds*
Common Goldeneye	22	NY	see *Waterfowl & Waterbirds*
Common Merganser	4	H	see *Waterfowl & Waterbirds*
Green-winged Teal	4	FY	see *Waterfowl & Waterbirds*
Hooded Merganser	3	H	see *Waterfowl & Waterbirds*
Mallard	32	NE	see *Waterfowl & Waterbirds*
Red-breasted Merganser	2	H	see *Waterfowl & Waterbirds*
Ring-necked Duck	9	FY	see *Waterfowl & Waterbirds*
Wood Duck		H	see *Waterfowl & Waterbirds*
Sora	1	S	two sora were calling in response to each other in marsh habitat on the unnamed watercourse (WC06) linking Rice Lake (WB06) and Dixie Creek on June 9, 2022; a sora was also heard on ARUs at Teardrop Lake on June 22, 2023 and northwest shore of Rice Lake on July 1, 2023; a sora was also flushed the north shore of Teardrop Lake (WB01) in August 2022 and September 2023.
Virginia Rail			none observed during 2022-2023 breeding seasons
Yellow Rail	1	S	see *Species at Risk*
Sandhill Crane	20	P	frequently heard or observed on point counts (including flyovers) but primarily in wet cutovers rather than marshes
Greater Yellowlegs	10	P	see *Shorebirds*
Solitary Sandpiper	1	H	see *Shorebirds*
Spotted Sandpiper	1	H	see *Shorebirds*
Wilson's Snipe	88	S	see *Shorebirds*
Bonaparte's Gull	7	FY	see *Colonial Nesting Birds*
Common Loon	52	FY	see *Waterfowl & Waterbirds*
American Bittern	1	S	heard during a morning point count on north shore of Rice Lake on June 9, 2022, and detected on one ARU at WB06 on June 26, 2023.
Great Blue Heron	8	H	see *Colonial Nesting Birds*
Osprey	1	H	see *Owls & Raptors*
Bald Eagle	41	N	see *Owls & Raptors*
Northern Harrier	2	H	see *Owls & Raptors*
Alder Flycatcher	206	T	common in marsh, thicket swamp, and other wetland habitats on Rice Lake (WB06), Teardrop Lake (WB01), Dixie Creek, and other waterbodies/watercourse in the AOI; also observed in wet cutovers
Sedge Wren	9	T	observed in marsh and shore fen habitats on Rice Lake (WB06) and Dixie Creek
LeConte's Sparrow	1	S	3 individuals heard on July 6, 2023, in wetland on north shore of Teardrop Lake
Swamp Sparrow	128	T	common in marsh, thicket swamp, and other wetland habitats on Rice Lake, Teardrop Lake, Dixie Creek, and other waterbodies/watercourse in the AOI
Common Yellowthroat	142	T	common in marsh, thicket swamp, and other wetland habitats on Rice Lake, Teardrop Lake, Dixie Creek, and other waterbodies/watercourse in the AOI; also observed in wet cutovers
Northern Waterthrush	31	S	relatively common in shoreline habitats on Rice Lake (WB06), Dixie Creek, and other watercourses in the AOI

[1] # of morning point counts on which the species was observed
[2] breeding evidence code (OBBA); see Appendix 30 for definitions

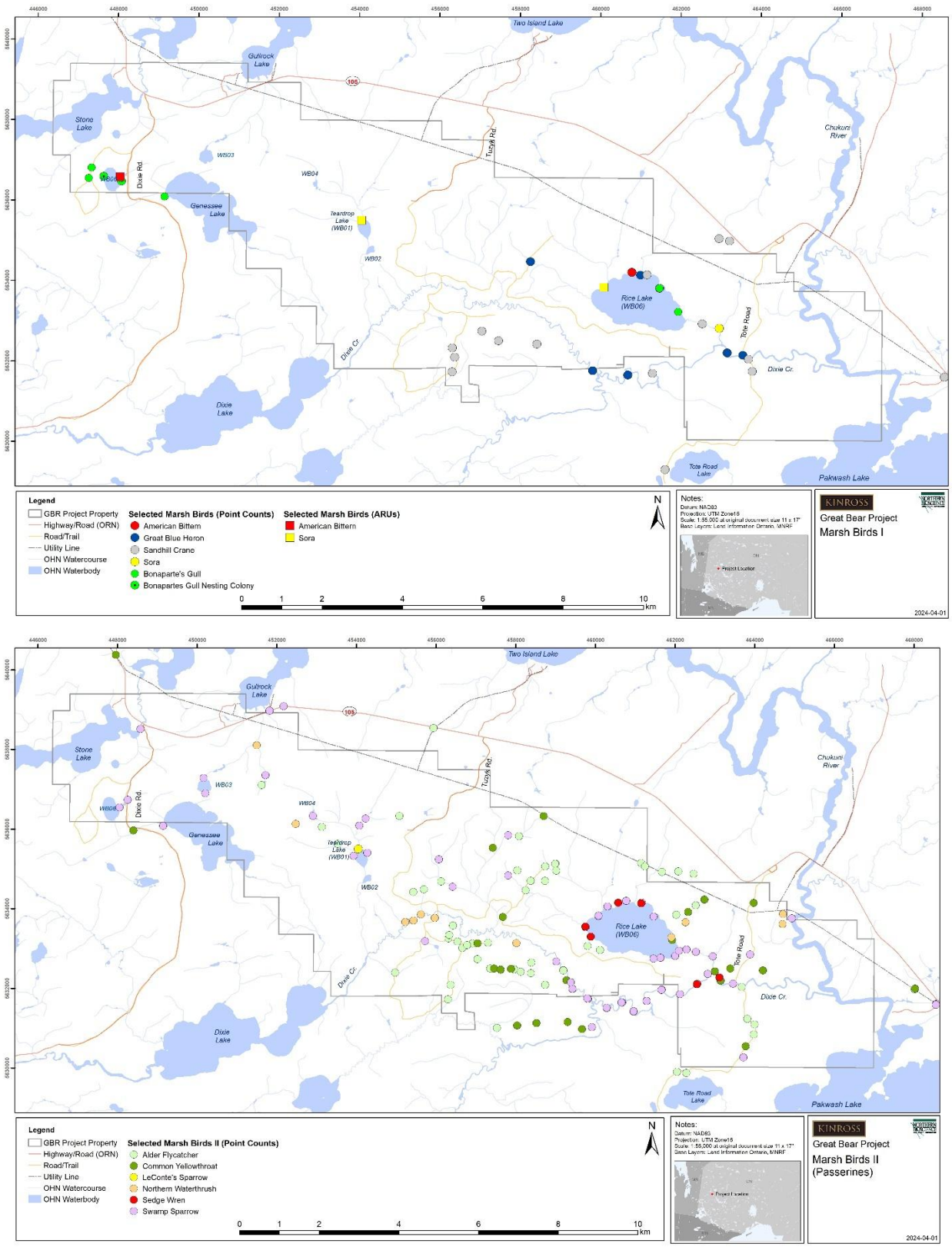


Figure 55. Selected marsh birds observed in the GBR AOI.

6.5 Waterfowl & Waterbirds

6.5.1 Breeding

A total of 21 species of waterfowl or waterbirds were observed during 2021-2023 surveys, including 15 species of ducks, 2 species of geese, three grebe species, and the common loon. Of these, at least 10 species of waterfowl were observed on the watercourses and waterbodies in the AOI during the breeding season (Table 8, Appendix 30). Breeding waterfowl were observed on Teardrop Lake (WB01), Rice Lake (WB06), unnamed WB07, and Dixie Creek, and based on field observations, the small waterbodies provide suitable breeding habitat for hooded merganser and common goldeneye (fledged young observed) and possibly for ring-necked duck, mallard, and common merganser (pairs observed).

To qualify as significant waterfowl nesting habit as per the draft Ecoregion 3W, three or more nesting pairs of waterfowl[13] must nest within 120 m of a >0.5 ha wetland or a cluster of three or more small (<0.5 ha) wetlands. Based on field observations to date, it is unknown if this threshold is met in the project AOI. Three pairs of trumpeter swans with 1-2 fledged young were observed on small waterbodies south of the AOI at least 5 km from the Project during the September 5, 2023, waterfowl aerial survey. Despite several pairs of swans observed during migration on both Teardrop and Rice lakes (Figure 56), no evidence of nesting was detected for this large, showy species. They were also detected May 5 and 13, 2022 on WB01 by trail camera TC-003a.

Although common loons were commonly heard and occasionally seen overhead on point counts, the only evidence of breeding for this species was a fledged young on WB0 west of Dixie Road North. Pairs of loons were not observed on Rice Lake, Teardrop Lake, or Dixie Creek in 2022 or 2023; extreme water level fluctuation in spring 2022 on those waterbodies likely would have precluded successful nesting of loons.

Figure 56. Pair of trumpeter swans observed on Rice Lake in May 2022.

6.5.2 Migration

Rice Lake and Teardrop Lake are significant stopover areas for migrating waterfowl and waterbirds, particularly during fall migration due to wild rice. Relatively small numbers of waterfowl were observed during spring migration (Appendix 35), although this may have been affected by the abnormally high water levels experienced in the spring of 2022. The numbers of fall migrants were very high in 2022 on Teardrop Lake (Appendix 35) due to abundant wild rice. Approximately 2000 ducks and geese observed

[13] of the following species: TRUS, WODU, GAWA, AMWI, ABDU, BWTE, NOSH, NOPI, GWTE, RNDU, BUFF, COGO, HOME, RBME, COME (see Appendix 30 for species codes)

during 2022 fall surveys, with over 500 ducks and geese of seven species observed on Teardrop Lake on the afternoon of September 22. Smaller numbers of migrating waterfowl were observed on Rice Lake in 2022, but this may be a function of a poor rice crop due to persistent flooding on Rice Lake during its early development. In contrast, large numbers of waterfowl were observed on Rice Lake in 2023 (Table 9), likely enough to meet the criterion for significance. Wild rice was less abundant on Teardrop Lake than Rice Lake in 2023 (unlike 2022) which may account for the difference in observed waterfowl use.

Table 9. Summary of total waterfowl and waterbird numbers observed on Teardrop and Rice lakes, 2021-2023*.

Waterbody	Fall 2021	Spring 2022	Summer 2022	Fall 2022	Spring 2023	Summer 2023	Fall 2023	Grand Total
Rice Lake (WB06)	60	-	6	444	285	85	1222	**2102**
Teardrop Lake (WB01)	-	60	49	1460	95	65	365	**2094**
Grand Total	**60**	**60**	**55**	**1904**	**380**	**150**	**1587**	**4196**

*Note that survey effort was not consistent among seasons and years.

No criterion schedules have been developed for Ecodistrict 4S but in Ecodistrict 3W, the significance threshold for significant aquatic waterfowl stopover and staging areas is 100+ waterfowl on 7+ days, or use by ruddy duck, canvasback, trumpeter swan, or tundra swan (OMNRF 2017). Ruddy ducks and canvasback and tundra swans were not observed in the AOI in 2022, but trumpeter swans were observed on both Teardrop and Rice lakes (Figure 56). Even in the absence of trumpeter swans, both Teardrop and Rice lakes exceeded the significance criterion based on total use-days in at least one of 2022 or 2023 fall migration.

No significant terrestrial stopover or staging areas for waterfowl are found in the AOI due to the lack of suitable large open areas.

6.6 Shorebirds

Shorebirds (Scolopacidae & Charadriidae) were not very diverse in the Great Bear AOI, with just six species observed (Appendix 30; Figure 58). Wilson's snipe was by far the most commonly observed species, being detected on more than 100 morning or evening point counts (Figure 58, Appendix 42). Although there is likely some observer bias given its loud, distinctive aerial display, its preferred breeding habitat of graminoid bogs, fens, alder/ willow swamps, wet meadows, and damp cutovers (Sandilands 2020) is relatively abundant in the much of the AOI. American woodcock was the 2nd most commonly detected shorebird species but was only detected during 13 nocturnal survey stations. It tends to have an earlier and briefer period of aerial courtship and is much harder to detect during standard point counts in June and later in the breeding season. Greater yellowlegs, solitary sandpiper, spotted sandpiper, and killdeer were the remaining shorebirds observed during the breeding season in the AOI, but only occasionally, in part because they are less likely to be detected on (mainly auditory) point counts. At least one pair of greater yellowlegs (Figure 57) likely bred in the AOI, in 2022 near Teardrop Lake (WB01, WB02); this species was also observed seven times in potentially suitable breeding habitat in riparian and wetland habitats along Dixie Creek. Killdeer were observed on a few occasions in relatively open, bare upland habitats such as along roads, clearings, gravel pit margins, and the transmission line ROW. One spotted sandpiper was observed along Dixie Creek, and it was observed incidentally along the rocky shoreline on Rice Lake (WB06). This common species nests on the ground in a wide variety of open and edge habitats, often near water (Peck 2007b; Sandilands 2010) and it likely bred in multiple locations in the AOI. Only one solitary sandpiper was observed during 2022-2023 fieldwork, during a morning point

count in conifer forest adjacent to a beaver pond on unnamed watercourse WC03F, which is typical breeding habitat in Ontario's boreal forest for this tree-nesting species (Peck 2007a; Sandilands 2010).

There is no significant wildlife habitat for shorebird migratory stopover areas in the Great Bear Project AOI. No seasonally flooded fields, open sandy shoreline habitat, or extensive mudflats or marshes are present. Shoreline habitat is limited, particularly open sandy or muddy ones, and use is likely to be far less than criterion for significance of 1000 shorebird use-days during spring or fall migration in Ecoregion 3W (OMNRF 2017).

Figure 57. Greater yellowlegs on WB01, June 2022.

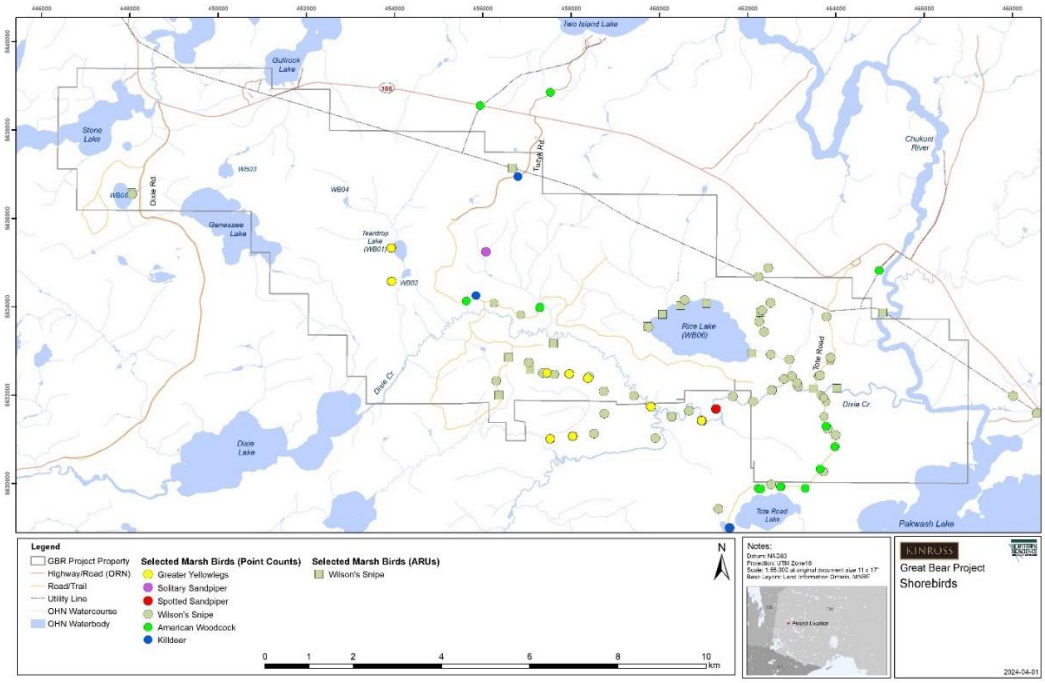


Figure 58. Shorebirds observed at the GBR AOI during 2022-2023 point counts or autonomous recording unit (ARU) deployments.

6.7 Colonial Nesting Birds

Several species of colonial nesting birds were observed in the GBR AOI in 2022-2023 including Bonaparte's gull, great-blue heron, and bank swallow. Colonial-nesting bank swallows, a SAR, are discussed in *Section 9.3.2 Bank Swallow*. Nesting colonies of swallows can be considered SWH[14] if there are four or more pairs of cliff and/or rough-winged swallows; habitat within 50 m of the colony periphery (i.e., outermost occupied nests) is SWH. No cliff or rough-winged swallows were observed at the Project AOI in 2021-2023, nor were any abandoned nests observed.

A colony of Bonaparte's gull was observed in 2022 and 2023 on the west shore of the small (ha) kidney-shaped lake (WB07) on the west side of Dixie Road North (Figure 59, Figure 59). At least 14 adults were present in 2022 and 10 in 2023. Nests were present in black spruce trees along the western shoreline of the lake, with fledged young observed as well in 2022. A nesting colony with five or more nests is considered significant wildlife habitat in Ecoregion 3W; habitat within 150 m of the colony edge is considered SWH. Bonaparte's gulls that nest on WB06 were occasionally observed foraging on nearby Genesee Lake more than 1 km from the nesting colony. Two Bonaparte's gulls were also observed on the northeast shore of Rice Lake on both July 2, 2022, and July 8, 2023. No evidence of nesting was found on Rice Lake and the gulls were not observed otherwise during the 2022 or 2023 breeding seasons on Rice Lake. It is presumed that these were either non-breeding or commuting individuals.

Individual great blue herons were occasionally observed during 2022-2023 fieldwork, including during the breeding season. Great blue herons were observed on six occasions along the lower Dixie Creek and once on the north shore of Rice Lake and once flying overhead west of Rice Lake (Figure 55). Single birds were also detected by trail cameras (TC-0003d and TC-067b respectively). on May 27-28, 2023, at WB01 and at the rapids on Dixie Creek on July 26, 2023. Pairs were not observed in-person nor detected by trail cameras. No heronries were observed in the AOI during aerial or ground surveys, nor are any documented for the area in the Red Lake FMP (Figure 53). Great blue herons were found twice on a morning point count along the English River, which may indicate breeding somewhere near Ear Falls. Nesting colonies of great blue herons in trees and shrubs with four or more nests can be considered SWH, and great blue heron colonies are also protected under forest management planning in Ontario (OMNR 2010).

Active colonies of 25 or more nests of double-crested cormorants can be considered SWH. This species prefers to nest in trees on islands but will nest on the ground if none are available. No cormorants were observed in the AOI during the 2022-2023 breeding seasons, however. The only observation of this species was a lone individual was observed at the rapids on Dixie Creek by a trail camera (TC-067b) outside the breeding seasons on September 9, 2023.

Although common terns were observed in migration and on six point counts during the breeding season (Appendix 30), there are no low-lying islets to provide suitable breeding habitat on Rice Lake, Teardrop Lake, or other waterbodies in the AOI. Individuals observed must have been foraging but nested elsewhere. Colonies of five or more breeding pairs can be considered SWH.

No colonial-nesting black terns were observed in 2022-2023; the emergent marshes in the AOI are likely too small to be suitable nesting habitat for this species (see Table 10 in *Species at Risk*).

[14] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

Figure 59. Bonaparte's gull breeding on small lake (WB07) in the western portion of the Great Bear property.

6.8 Game Birds

The Great Bear AOI does provide suitable breeding habitat for game birds such as grouse, waterfowl (see *6.5 Waterfowl & Waterbirds*), woodcock & snipe (see *6.6 Shorebirds*), and sandhill cranes[15] (see *6.4 Marsh Birds*). These species and others may be of significance to Indigenous communities as well as non-indigenous hunters.

Three species of grouse are present in the AOI, including ruffed grouse, spruce grouse, and sharp-tailed grouse. Ruffed grouse are widespread in their preferred habitat i.e., regenerating and mature coniferous, mixed, and hardwood forest, particularly trembling aspen and/or white birch (Sandilands 2005). Approximately 336 ha of potentially suitable habitat for ruffed grouse is present on the GBR property according to OMNRF habitat models (Figure 61). Ruffed grouse were detected on over 140 point counts (morning and evening) and ARU deployments in the AOI (Figure 61). Breeding was confirmed, with fledged young observed on multiple occasions.

Spruce grouse was much less commonly detected on point counts and otherwise, in part because they do not drum like ruffed grouse. Their preferred habitat is young to mature lowland and upland conifer forest, typically dominated by jack pine, black spruce, and/or tamarack (D'Eon et al. 1994; Sandilands 2005); this habitat is widespread in the AOI (Figure 61). Approximately 530 ha of potentially suitable habitat for spruce grouse is present on the GBR property according to OMNRF habitat models (Figure 61). Breeding was also confirmed, with fledged young observed on multiple occasions.

Sharp-tailed grouse, belonging to the northern subspecies (*Tympanuchus phasianellus phasianellus*), were observed occasionally in the GBR AOI (Figure 61). In northern Ontario, typical habitat for this subspecies is semi-open peatlands and cutovers; farther south (e.g., Dryden, Rainy River), the prairie subspecies (*T.p. campestris*) is also found in pastures/fields (Sandilands 2005; Escott 2007b). A small flock (n=4) of sharp-tailed grouse was observed in the cutover southwest of Rice Lake during the February 2022 aerial survey and another loose flock (n=5) was seen approximately 5 km west of Dixie Lake (off the GBR property). Several small flocks of 3-7 birds were flushed from open peatlands along Dixie Creek in September 2023. A flock of six individuals were observed in regenerating cutover north of Rice Lake in October 2021. Deployment of a trail camera confirmed its use as a lek or communal display ground (Figure 60). The lek has relative sparse 1-5 m tall jack pine and spruce, with an herb- and graminoid-rich understory and clayey soils. Two other leks were also observed in May 2022 on the north side of Highway 105; one (~20 x 40 m) was in a sandy clearing with regenerating jack pine (8-10 m tall)

[15] https://www.canada.ca/en/environment-climate-change/services/migratory-game-bird-hunting/consultation-process-regulations/report-series/proposals-amend-document-2024.html#toc12

and another (~15 x 30 m) on a rocky outcrop. Sharp-tailed grouse leks are considered Significant Wildlife Habitat.

Figure 60. Displaying sharp-tailed grouse (left) on lek (right) in a regenerating cutover north of Rice Lake.

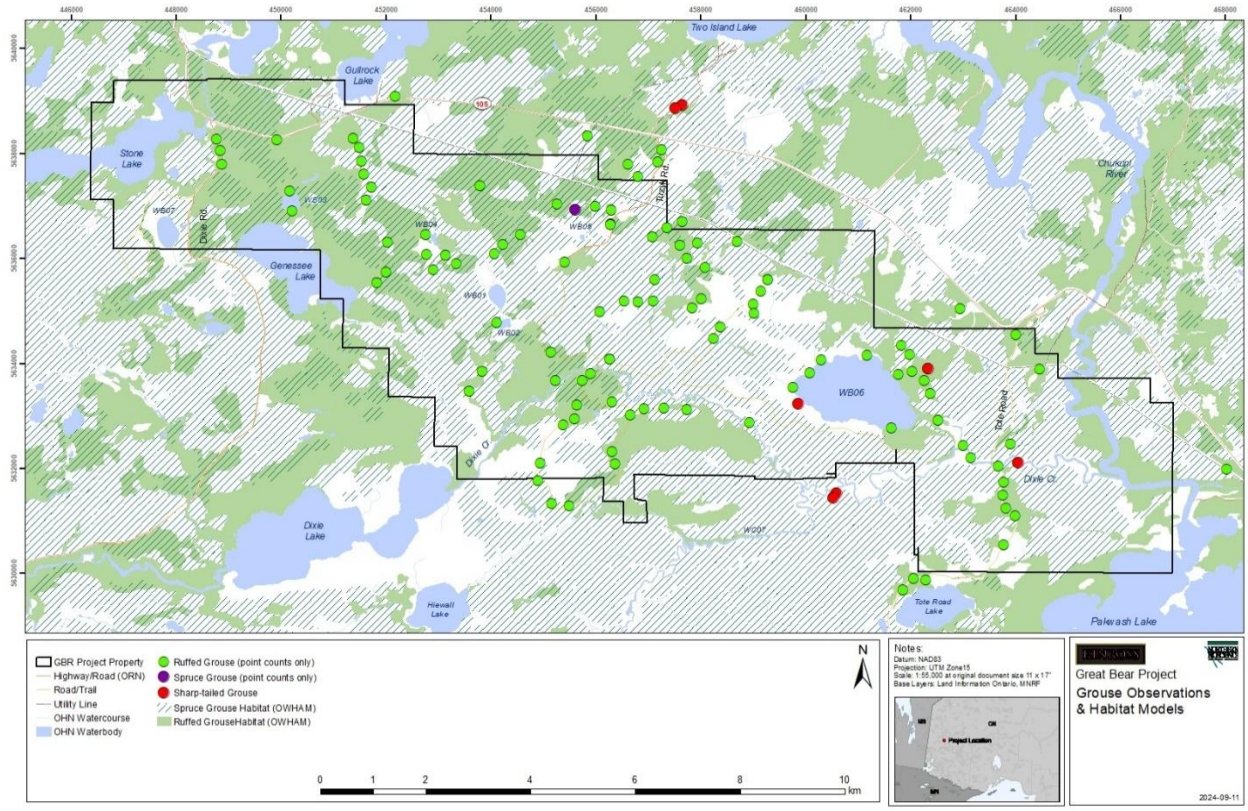


Figure 61. Location of grouse observations and modeled habitat in the Project AOI.

7 REPTILES AND AMPHIBIANS

Six species of amphibians have been confirmed as occurring in the Great Bear Project AOI, with a few others potentially occurring based on their broad ranges and habitat within the AOI (Appendix 36). No abundance estimates were calculated, but anurans (frogs and toads) were generally widespread and relatively abundant (Figure 63). Anurans were routinely heard during nocturnal surveys (Appendix 6) as well as on acoustic recorders (Appendix 13), particularly during deployments in late May and June. Spring peeper (118 stations) wood frog (58) Gray tree frog (41), and American toad (34) were commonly heard during nocturnal surveys, with the former two species beginning in early May and the latter two species more prevalent later in the season. No mink frogs nor green frogs were heard, but these species have the latest breeding season. Fewer nocturnal surveys were done later in the season, and timing was likely later than usual in 2022 due to the higher-than-average spring flooding. Mink frogs have been confirmed visually from the Great Bear property on Rice Lake and the small lake east of Dixie Road N (Figure 62).

Numerous (>30) wood frog egg masses marsh between Teardrop Lake and WB01, later stranded by declining water levels. Some of the waterbodies in the GBR AOI may qualify as significant amphibian breeding habitat according to the draft Ecoregion 3W criterion schedules[16] (OMNRF 2017). The 3W threshold for significant wetland amphibian breeding habitat requires the presence of at least 20 breeding individuals of a salamander or newt species or at least four anuran (frog/toad) species including either northern leopard, mink, or green frog. No potentially significant vernal pool amphibian breeding habitat was observed in 2022 or 2023 fieldwork.

Several eastern gartersnake (Figure 62, Figure 63) were observed on the property in 2022 and 2023; all were lone individuals. Eastern garternakes have been documented hibernating singly or communally, typically in moist to wet conditions below the frost line. These include a wide variety of sites such as bedrock crevices, talus slopes, rock piles, mammal burrows, and anthropogenic structures (Rowell 2012 and references therein). To qualify as SWH in Ecoregion 3W, a hibernaculum must have use by at least five individuals; two or more snakes near a potential hibernaculum on sunny warm days in April-May or September-October may indicate use of a potential hibernaculum nearby. Although potentially suitable habitat may exist on the GBR property, no aggregations of snakes were observed during spring or fall fieldwork in 2022-2023.

Painted turtles were observed at several locations in the AOI including Rice Lake, Dixie Creek, Stone Creek, and the unnamed lake west of Dixie Creek Road N (Figure 63). See *9.4.1 Common Snapping Turtle* for discussion of this SAR. Despite repeated surveys (Appendix 16), no painted turtles were observed on Teardrop Lake or WB01.

Turtle nesting habitat, with the confirmed presence of one or more nests, can be considered SWH, although usually not when found along active roadways. Female painted turtles begin nesting in late May-June and search for well-drained soil or sandy substrates often along south to southwest-facing roadways, fields, and beaches (COSEWIC 2016c). Painted turtles have been known to move up to 150 m from waterbodies when nesting, typically with the distance travelled inversely proportional to availability of good nesting habitat near a pond (Baldwin et al. 2004; COSEWIC 2016c). Suitable well-drained mineral soil is found in the existing aggregate pits and along the forest access roads, but these areas do not make the best turtle nesting habitat as they are prone to predation. However, even when other suitable nesting habitat is available further from water, most females prefer nesting close to water, perhaps because of the risks associated with nesting further from the water's edge (R. Brooks pers. comm. 2005 in COSEWIC 2016c). Potentially suitable nesting habitat is found on sandy shorelines and riverbanks including WB02 and Dixie Creek. Painted turtles, apparently searching for nesting habitat,

[16] Criteria schedules are in development for Ecoregion 4S; draft schedules from 3W, the only ones currently available for northwestern Ontario, are used as guidance.

were observed along Tote Road and Highway 105 near waterbodies. In 3W, roadside habitat is not considered SWH.

Painted turtles overwinter in wetlands and the shallow bays of lakes, moving to these areas in early fall in response to declining water and air temperatures (COSEWIC 2016c). Suitable waterbodies have sufficient water depth not to freeze to the bottom, typically soft substrates, and adequate dissolved oxygen (St. Clair and Gregory 1990). During winter, turtles may make small movements but become dormant in muddy substrates when conditions become anoxic (Taylor and Nol 1989). Overwintering areas with one or more turtles can be considered SWH. Hatchling painted turtles may either overwinter in the natal nest chamber or in the aquatic environment (COSEWIC 2016c) – both can be considered SWH. No evidence of overwintering turtles has been observed during 2021-2023 fieldwork (e.g., very early or late in season), but it is probably that overwintering habitat exists on Rice Lake (WB04) and WB06 and potentially other waterbodies where turtles have been observed (e.g., Dixie Creek).

Amphibian movement corridors can be considered SWH such as traditional travel routes of salamanders to vernal pool breeding habitat. No amphibian movement corridors are documented for the area nor observed during field surveys.

Figure 62. Eastern gartersnake (left) and mink frog (right) observed at the Great Bear Project AOI during 2022 fieldwork.

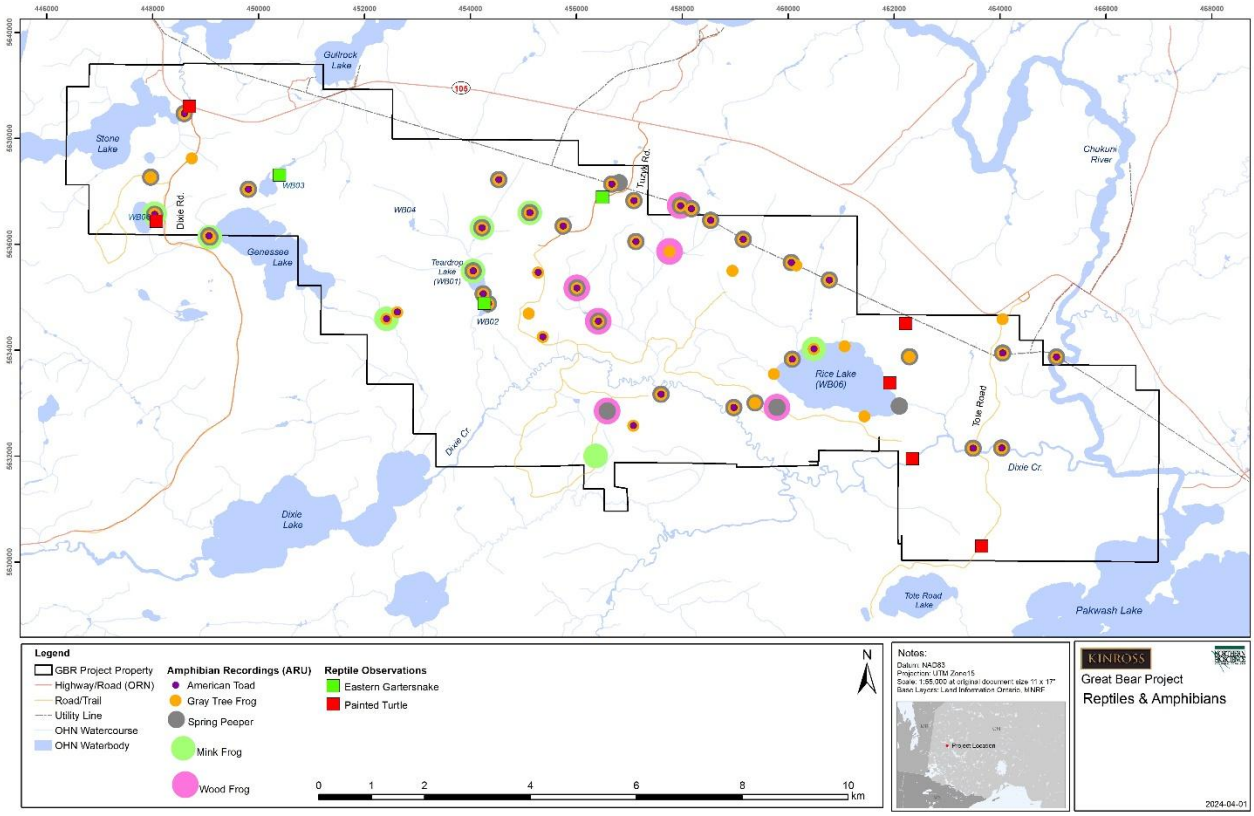


Figure 63. Reptile observations and amphibian (anuran) recordings identified from autonomous recording units (ARUs) in the GBR AOI, 2022-2023.

8 INSECTS

Field surveys in 2022 focused on insect groups of higher conservation concern (e.g., S1-S3 ranked), particularly odonates (i.e., dragonflies and damselflies) and butterflies. A total of 23 species of odonates was confirmed from the AOI (Appendix 38). Additional species are likely present given broad ranges (Paulson 2011), and habitat types present in the AOI. Of note is a cobra clubtail (*Gomphurus vastus*) observed on Dixie Lake to the south of the Project AOI on September 5, 2022, by K. Mitchell (iNaturalist 2024). This dragonfly species is ranked as S1 in Ontario and is known from fewer than 20 locations in the province. Uncommon and local, the species is known from relatively few records in northern Ontario (iNaturalist 2024; TBFN 2010). It is typically associated with rivers and rocky lakeshores (Foster pers. obs.; Jones et al. 2020; Paulson 2011) and could potentially occur on Rice Lake or Dixie Creek. No other provincially rare odonates are known from the Project AOI.

A total of 25 species of butterflies has been documented for the GBR AOI, including 22 species observed during 2022-2023 fieldwork (Appendix 39). Additional butterfly species are likely present given broad ranges (eButterfly 2024; Hall et al. 2014; Macnaughton et al. 2024) and habitat types present in the AOI. Numerous western whites were observed in August 2023 along Tuzyk's Road, Tote Lake Road, and other forest access roads in the area. This species is mainly found in western North America and is considered rare in Ontario (S3) (NHIC 2024). It prefers open areas, including woodland clearings, roadsides, and tundra (Hall et al. 2014). Its larval host plant are various mustards (Brassicaceae) (Hall et al. 2014), some of which may be found in the GBR AOI. This species has two broods a year and tends to be more abundant during hot, dry summers (Layberry et al. 1998), such as was experienced in 2023.

Large numbers of western whites suddenly appeared across Rainy River district in July 2023 and may have originated in Manitoba, given few were observed in the district in 2022 (Dawber et al. 2024).

Apart from the western white, no butterfly species confirmed from the AOI is considered provincially rare (S1-S3) by OMNRF's Natural Heritage Information Centre (NHIC). No monarch (*Danaus plexippus*) were observed during 2022-2023 fieldwork, but yellow-banded bumblebee (*Bombus terricola*) were confirmed on the GBR property. See *9.5 Insect SAR* for a discussion of these at-risk species.

Figure 64. Western white observed in August 2023 in the GBR AOI.

9 SPECIES AT RISK

Approximately 30 federal or provincial species at risk have ranges that broadly overlap the Project AOI and for which potentially suitable habitat occurs in the AOI, at least for foraging or during migration (Table 10). Of these, 13 species have been confirmed in the Project AOI. Several other species have been found in the Red Lake area and potentially have suitable habitat in the AOI, but whose presence has not been confirmed. Their absence may be the result of a) the habitat appearing suitable but is not suitable, b) the habitat is suitable but is unoccupied for other unknown reasons, c) or the species were present but not detected, or d) other undetermined reasons. SAR that have been confirmed from the Project AOI and/or have potentially suitable habitat on the property are discussed in detail below.

Potential fish species at risk such as lake sturgeon (*Acipenser fulvescens*) and shortjaw cisco (*Coregonus zenithicus*) will be discussed separately in aquatic reports.

With respect to potential SWH, there are no COSEWIC-listed Threatened or Endangered species that don't have equivalent protection under Ontario's ESA that are present at or near the Great Bear Project. No additional species that are rare or substantially declining in Ontario are documented for the AOI, nor were any observed during 2021-2022 field surveys. No additional species that have a high percentage of their global population in Ontario are known from the AOI.

Table 10. Summary of potential species at risk within the Great Bear Project AOI.

Common Name	Scientific Name	SARO	COSEWIC / Schedule 1[1]	Within Range[2]	Potential Habitat	Confirmed	Distribution/Habitat Notes
Mammals							
American Badger (Northwestern population)	*Taxidea taxus taxus*	END	SC / SC	N	N	-	One badger record in the Red Lake area but Great Bear Project is 100+ km from nearest known populations in Ontario or Manitoba
Woodland Caribou (Boreal population)	*Rangifer tarandus pop. 14*	THR	THR / THR	Y	Y	?	Documented in surrounding landscape and potential habitat at Great Bear Project – see discussion below
Cougar	*Puma concolor*	SC / END[5]	DD	Y	?	-	No confirmed extant populations in northwestern Ontario, although occasional lone vagrants documented
Gray Fox	*Urocyon cinereoargenteus*	THR	THR / THR	N	N	-	Project is 200+ km from nearest known populations at near Fort Frances
Little Brown Myotis	*Myotis lucifugus*	END	END / END	Y	Y	Y	Confirmed presence in Project AOI – see discussion below
Northern Myotis	*Myotis septentrionalis*	END	END /END	Y	Y	?	No confirmed presence at Project; see discussion below
Tri-colored Bat	*Perimyotis subflavus*	END	END/END	Y	Y	?	A few provisionally identified acoustics recordings – see discussion below
Eastern Red Bat	*Lasiurus borealis*	END	END/END	Y	Y		Confirmed presence in Project AOI – see discussion below
Hoary Bat	*Lasiurus cinereus*	END	END/END	Y	Y		Confirmed presence in Project AOI – see discussion below
Silver-haired Bat	*Lasionycteris noctivagans*	END	END/END	Y	Y		Confirmed presence in Project AOI – see discussion below
Wolverine	*Gulo gulo*	THR	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Birds							
American White Pelican	*Pelecanus erythrorhynchos*	THR	NAR	Y	Y	Y	Only observed in overflight of the property in 2022 – see discussion below
Bald Eagle	*Haliaeetus leucocephalus*	NAR / SC[4]	NAR	Y	Y	Y	Confirmed use of the property – see discussion below
Bank Swallow	*Riparia riparia*	THR	THR / THR	Y	Y	Y	Confirmed use of the property – see discussion below
Barn Swallow	*Hirundo rustica*	SC[4] / THR	THR / THR	Y	Y	Y	Confirmed use of the property – see discussion below
Black Tern	*Chlidonias niger*	SC	NAR	Y	Y	-	Documented from near Red Lake; potential foraging or nesting habitat in Great Bear Project area
Bobolink	*Dolichonyx oryzivorus*	THR	THR / THR	N	N	-	Project is 100+ km from nearest known populations in Kenora/Dryden area; suitable grassland habitat lacking at or near Project

Common Name	Scientific Name	SARO	COSEWIC / Schedule 1[1]	Within Range[2]	Potential Habitat	Confirmed	Distribution/Habitat Notes
Buff-breasted Sandpiper	*Calidris subruficollis*	DD	SC / -	Y(M)	Y(M)	-	Within potential range for migrants but no suitable nesting habitat at or near Project
Canada Warbler	*Cardellina canadensis*	SC	SC / THR	Y	Y	Y	Confirmed use of the property – see discussion below
Chimney Swift	*Chaetura pelagica*	THR	THR / THR	N	N	-	Project is 100+ km from nearest reported observations at Kenora; no anthropogenic structures or suitable nesting habitat (large-diameter snags) present at or near Project
Common Nighthawk	*Chordeiles minor*	SC	THR/ THR	Y	Y	Y	Confirmed use of the property – see discussion below
Eastern Meadowlark	*Sturnella magna*	THR	THR / THR	N	N	-	One eastern meadowlark record in the Red Lake area, but Great Bear Project is 100+ km from nearest known populations in Ontario or Manitoba
Eastern Whip-poor-will	*Antrostomus vociferus*	SC	SC[3] / THR	Y	Y	Y	Confirmed use of the property – see discussion below
Eastern Wood-Pewee	*Contopus virens*	SC	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Golden Eagle	*Aquila chrysaetos*	END	NAR	Y(M)	Y(M)	-	Within potential range for migrants but no historic or current evidence of use
Golden-winged Warbler	*Vermivora chrysoptera*	SC	THR /THR	N	N	-	Project is 250+ km from nearest known populations in Ontario (Rainy River area) or Manitoba
Horned Grebe	*Podiceps auritus*	SC	SC / SC	Y	Y	-	Documented from near Red Lake; potential foraging or nesting habitat in Great Bear Project area
Hudsonian Godwit	*Limosa haemastica*	THR	THR / -	Y(M)	Y(M)	-	Within potential range for migrants but no suitable nesting habitat at or near Project
Least Bittern	*Ixobrychus exilis*	THR	THR / THR	N	N	-	Project is 100+ km from nearest known populations near Lake of the Woods
Lesser Yellowlegs	*Tringa flavipes*	THR[5]	THR[5] / -	Y(M)	Y(M)	-	Within potential range for migrants but no suitable nesting habitat at or near Project
Loggerhead Shrike	*Lanius ludovicianus*	END	END / END	N	N	-	Project is 150+ km from nearest known populations in Ontario (Rainy River area)
Olive-sided Flycatcher	*Contopus cooperi*	SC	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Peregrine Falcon	*Falco peregrinus*	SC	NAR / SC	Y	Y	-	Within range but no suitable nesting habitat (i.e., cliffs) at Project; potential foraging habitat, at least in migration but no evidence of use
Piping Plover	*Charadrius melodus*	END	END / END	N	N	-	Project outside of range and no suitable habitat (large beaches) at or near Project

Common Name	Scientific Name	SARO	COSEWIC / Schedule 1[1]	Within Range[2]	Potential Habitat	Confirmed	Distribution/Habitat Notes
Red Knot	*Calidris canutus*	END	END / END	Y(M)	(YM)	-	Within potential range for migrants but no suitable nesting habitat at or near Project
Red-headed Woodpecker	*Melanerpes erythrocephalus*	END[5]	END / END	N	N	-	Project is 150+ km from nearest known breeding populations in Rainy River area
Red-necked Phalarope	*Phalaropus lobatus*	SC	SC / SC	Y(M)	Y((M)	-	Within potential range for migrants but no suitable nesting habitat at or near Project
Rusty Blackbird	*Euphagus carolinus*	SC	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Short-eared Owl	*Asio flammeus*	THR	THR / THR	Y(M)	N	Y(M)	Confirmed use of the property – see discussion below
Wood Thrush	*Hylocichla mustelina*	SC	THR / THR	N	N	-	Project is 150+ km from nearest known breeding populations in Rainy River area
Yellow Rail	*Coturnicops noveboracensis*	SC	SC / SC	Y	Y	Y	Potential use of the property in migration – see discussion below
Reptiles & Amphibians							
Common Snapping Turtle	*Chelydra serpentina*	SC	SC / SC	Y	Y	Y	Confirmed use of the property – see discussion below
Insects							
Aweme Borer Moth	*Papaipema aweme*	END	DD	Y	N	-	Within broad range and but no suitable large rich fen habitat at or near Project
Gypsy Cuckoo Bumble Bee	*Bombus bohemicus*	END	END / END	N	-	-	No confirmed extant records in northwestern Ontario
Monarch	*Danaus plexippus*	SC	END / END	Y	N	-	Project is 200+ km from nearest known populations in Ontario or Manitoba (vagrants may stray farther north) and outside known range of larval host plant (milkweed)
Rusty-patched Bumble Bee	*Bombus affinis*	END	END / END	N	N	-	No confirmed extant records in northwestern Ontario
Yellow-banded Bumble Bee	*Bombus terricola*	SC	SC / SC	Y	Y	-	Confirmed use of the property – see discussion below
Plants							
Black Ash	*Fraxinus nigra*	END	THR / -	Y	Y	Y	Confirmed use of the property – see discussion below
Pitcher's Thistle	*Cirsium pitcheri*	THR	SC / -	N	N	-	Project at northern edge of range but no suitable habitat (large beaches) at or near Project
Fungi							
Flooded Jellyskin	*Leptogium rivulare*	NAR	SC / -	Y	Y	-	Project is within broad range but no known occurrences; none observed on black ash observed in 2022

[1] some species have been assessed by COSEWIC but not added to Schedule 1 of SARA

[2] within range only as a migrant (M)

[3] recently re-assessed as SC federally and provincially

[4] Downlisted from SC to NAR in 2022 by COSSARO (https://www.ontario.ca/page/2022-annual-report-committee-status-species-risk-ontario-cossaro); not yet reflected in provincial ESA regulations (https://www.ontario.ca/laws/regulation/080230/v8)

[5] Downlisted from END to SC in 2022 by COSSARO (https://www.ontario.ca/page/2022-annual-report-committee-status-species-risk-ontario-cossaro); not yet reflected in provincial ESA regulations (https://www.ontario.ca/laws/regulation/080230/v8)

9.1 Plant SAR

Black ash is the only federally or provincially assessed plant SAR that has potential to occur in the Great Bear Project AOI.

9.1.1 Black Ash

Black ash (*Fraxinus nigra*), recently listed as Endangered, is present in the AOI at several locations (Figure 26). Given that there is estimated to be approximately 83 million black ash trees in Ontario, protection for this species under Sections 9 and 10 of the ESA is limited to areas of southern Ontario where black ash has experienced significant mortality due to the invasive emerald ash borer (*Agrilus planipennis*)[17], the primary threat to the tree species (COSEWIC 2018a).

A 5-ha stand with 70% overstory cover of black ash is found on the northeast shore of Rice Lake, and there are an additional 57 ha of adjacent forest with at least 10-20% overstory cover of black ash according to the Red Lake Forest FRI. There is a smaller <<3 ha stand of nearly pure black ash along a creek system north of Genessee Lake, as well scattered individuals (including in clearcuts) in low-lying depressions elsewhere on the property. More extensive black ash stands are found along the northwest shore of Pakwash Lake.

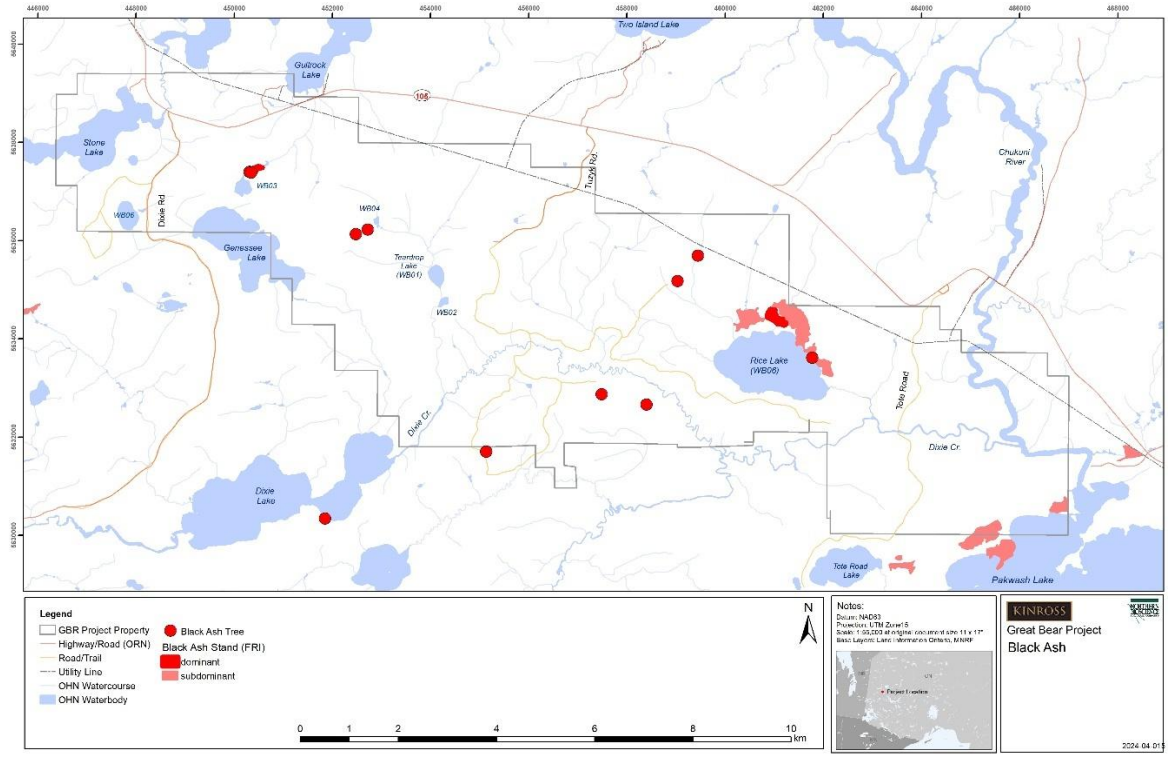


Figure 65. Black ash at the GBR Project site.

[17] https://ero.ontario.ca/notice/019-7378

9.2 Mammal SAR

Mammalian SAR that may be present in the Project OI, including boreal caribou, wolverine and six species of at-risk bats, are discussed below. No additional mammal SAR are expected to be present based on available habitat, known ranges, and similar surveys conducted in the AOI.

9.2.1 Boreal Caribou

9.2.1.1 Observations

No caribou or evidence of their presence (e.g., tracks, pellets, lichen cratering, bones) were observed during 2021-2024 fieldwork. A review of available information provided by MECP/NHIC/OMNRF indicates no recent observations of caribou in or near the Project either. Caribou observations within the Sidney Range are concentrated towards the west near Woodland Caribou Provincial Park (Figure 66).

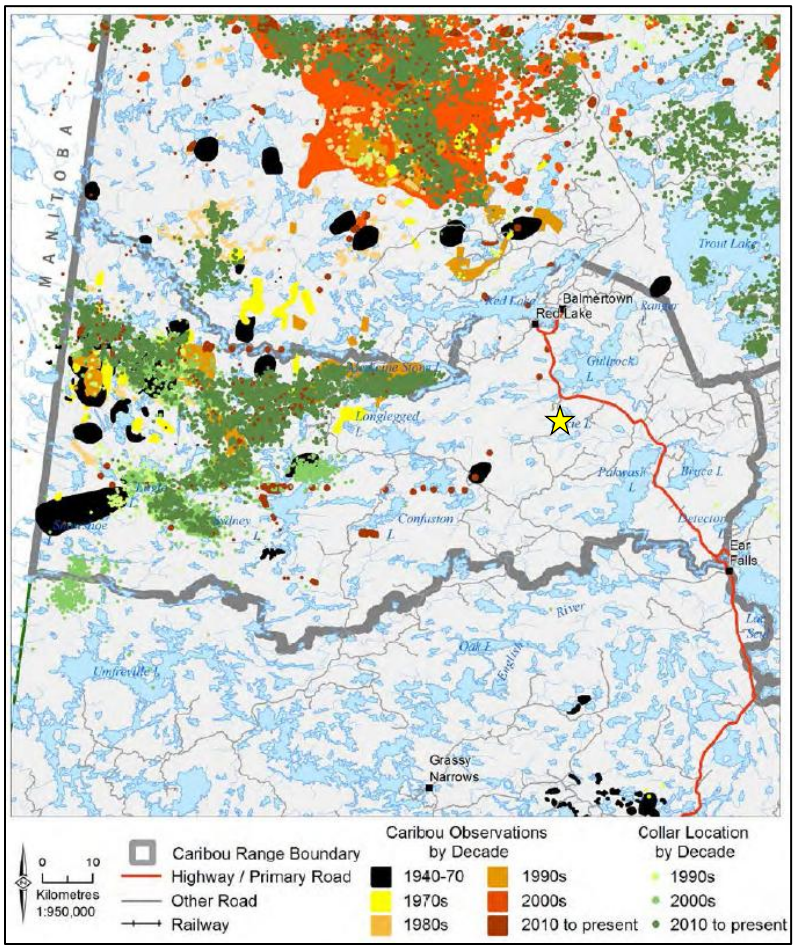


Figure 66. Historical caribou observations[18] within the Sydney Range and surrounding area including observations from aerial surveys, collared caribou locations, research projects, and casual observations. (OMNRF 2014c). Star denotes the approximate location of the Great Bear Project.

The Sydney Range was based on documented caribou occupancy at the south end of Woodland Caribou Provincial Park (WCPP), caribou movement between Ontario and Manitoba, as well as historical occupancy patterns south of Red Lake (MNRF 2014c). The spatial extent of the Sydney Range is likely too small to support an independent and sustainable population of caribou, and therefore is considered to be ecologically inter-dependent upon the ecological integrity of the Owl-Flintstone Range in adjacent Manitoba. Most occurrences of caribou are from the western portion in the Sydney Range with few documented records in the eastern half near the Great Bear Project (Figure 66).

Based on winter distribution survey results there was a minimum animal count (MAC) of 55 in the Sydney Range in 2012 (OMNRF's 2014c). The actual number of caribou in the range is expected to be higher due to incomplete detection during aerial surveys, but not significantly so (74 were observed during recruitment surveys in 2013). There are many areas within the Sydney Range where caribou existed during the 1960s but were not found during the 2012-2013 surveys and available evidence indicates the Sydney Range as having a long-term declining trend in caribou abundance. Given population indices and the highly disturbed range condition, the risk to long-term caribou persistence is considered high.

9.2.1.2 Caribou Habitat & Ranges

Ontario's Woodland Caribou Conservation Plan (CCP) identifies caribou "ranges" as the geographical basis for caribou management, and are based upon caribou movements, distribution and shared geography, habitat functions and behavioural responses, and predominant risk factors (OMNR 2009). When considering the impact of exploration activities on caribou habitat, consideration needs to be given to the overall range condition (OMNR 2013b). The Great Bear Project is located near the eastern boundary of the Sydney Range (OMNRF 2014c) (Figure 67). The Sydney Range was the focus of broad population monitoring and habitat assessment as part of the integrated range assessment process (OMNRF 2014c). According to the range assessment (OMNRF 2014c), the landscape of the Sydney Range is largely characterized as boreal forest with a high density of medium and small-sized lakes, extensive jack pine and black spruce, abundant bedrock exposure with shallow and coarse soils, and a prairie boreal climate affecting a portion of the range.

As of 2012, approximately 63% of the Sydney Range was considered disturbed, with extensive wildfires in the recent past, and widespread ongoing anthropogenic disturbance in the eastern portion of the range (OMNRF 2014c)(Figure 68, Figure 69). Disturbed forests less than approximately 40 years old are not generally suitable as caribou habitat. Past wildfires, recent cutovers, existing roads and trails all fragment the landscape surrounding the Great Bear Project. Based on OMNRF's 2012 winter caribou survey, there is a lower probability of caribou occurrence near the Great Bear Project area due to high levels of disturbance (Figure 70). Nonetheless, according to OMNRF caribou habitat modelling conducted for the Red Lake FMP (OMNRF 2014c), the forest may still be capable of supporting woodland caribou, as there is suitable winter and refuge habitat (Figure 71). According to OMNRF caribou models there is approximately 307 ha of caribou winter habitat and 627 of refuge habitat on the GBR property.

[18] Home ranges for individual caribou are large, averaging 4,000 km^2 (Brown et al. 2003), and location observations of caribou should not be interpreted as just a single observation point, as it is only one point in time and include group sightings. The actual area used by caribou is much larger as they move throughout the year.

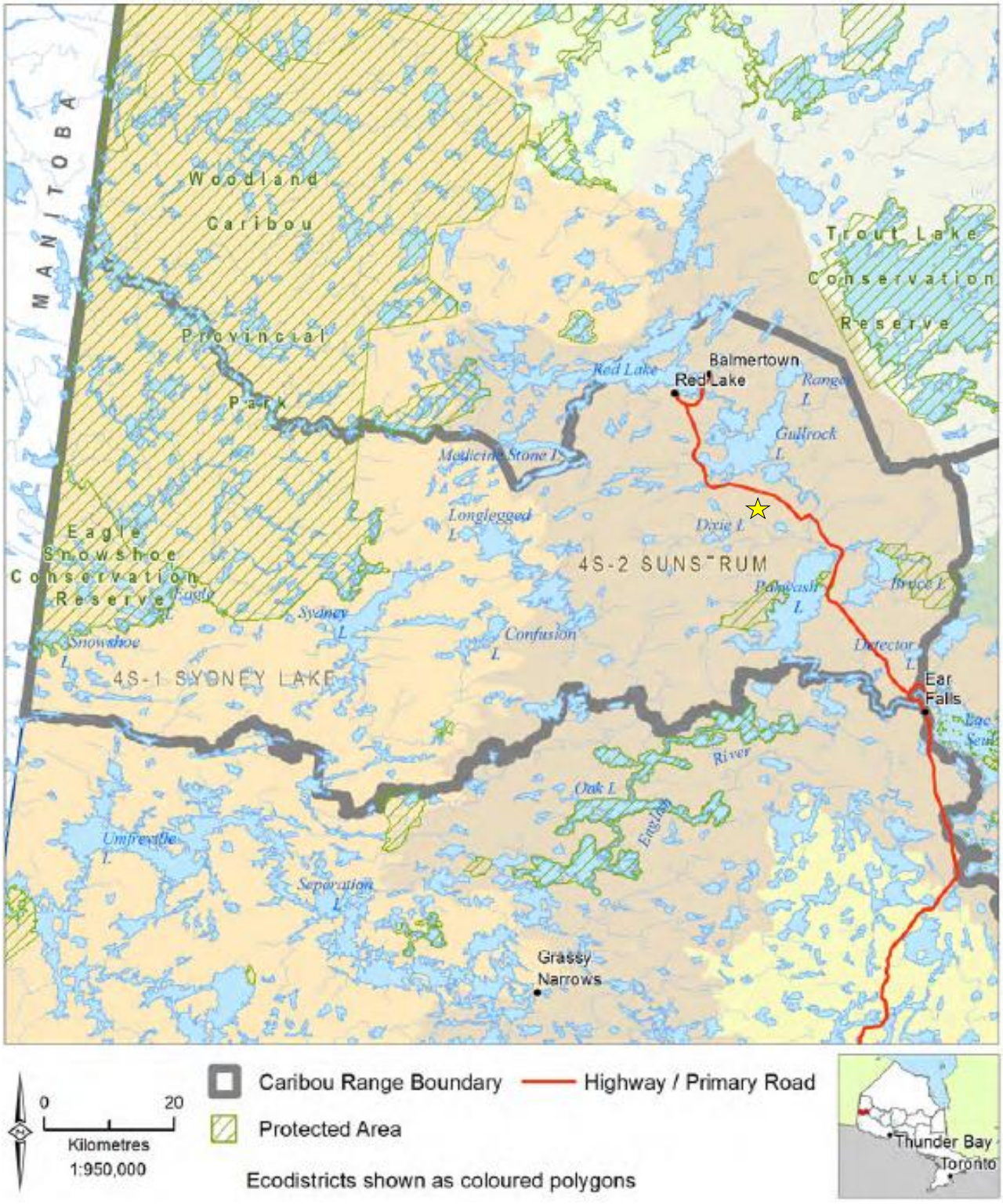


Figure 67. The Great Bear Project (star) in relation to OMNRF's (2014) caribou range boundaries.

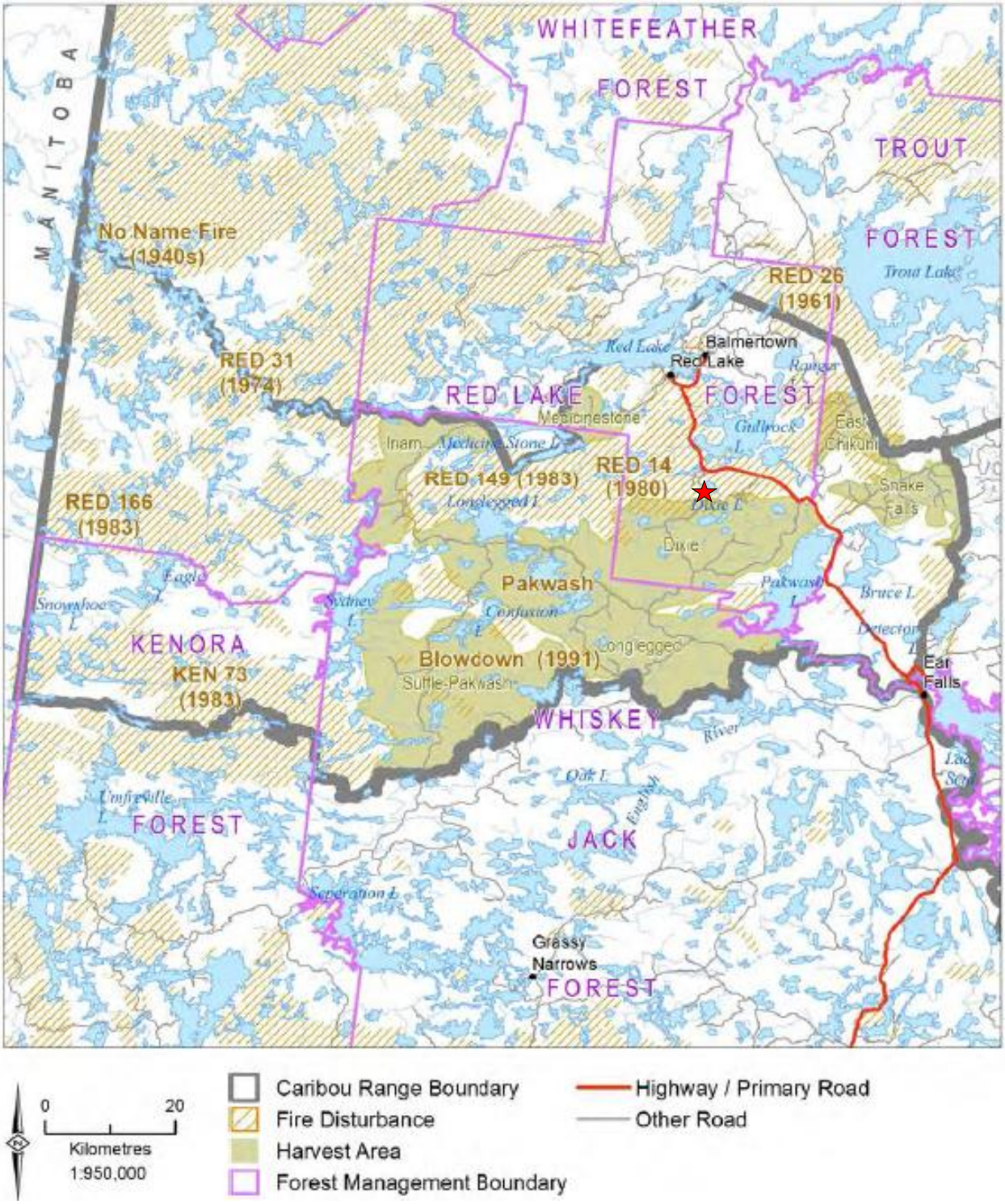


Figure 68. The Great Bear Project (star) in relation to OMNRF's (2014) significant historical natural and anthropogenic disturbance in the Sydney Range.

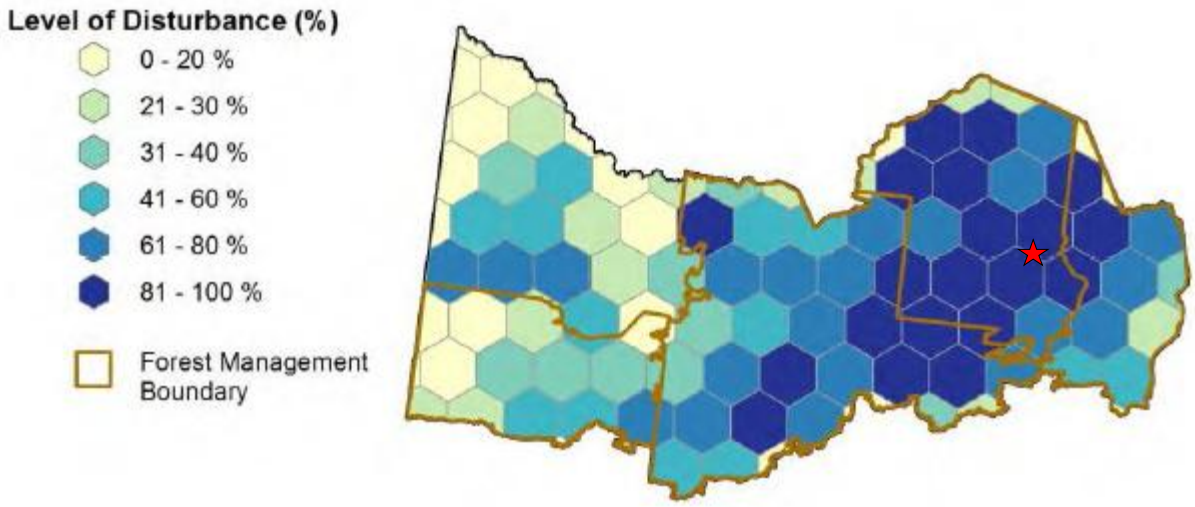


Figure 69. The concentration of natural and anthropogenic disturbances on the Sydney Range within 100 km^2 hexagon grid cells. Star denotes the approximate location of the Great Bear Project.

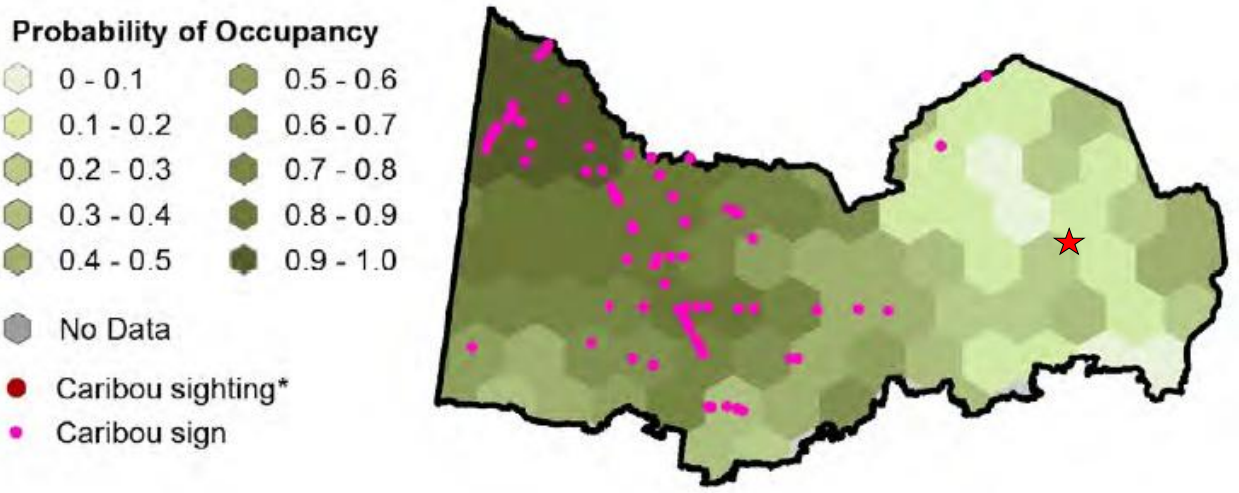


Figure 70. Great Bear Project (red star) in relation to the probability of occupancy determined using habitat covariates across the Sydney Range overlaid with caribou signs and sightings from the 2012 winter aerial survey.

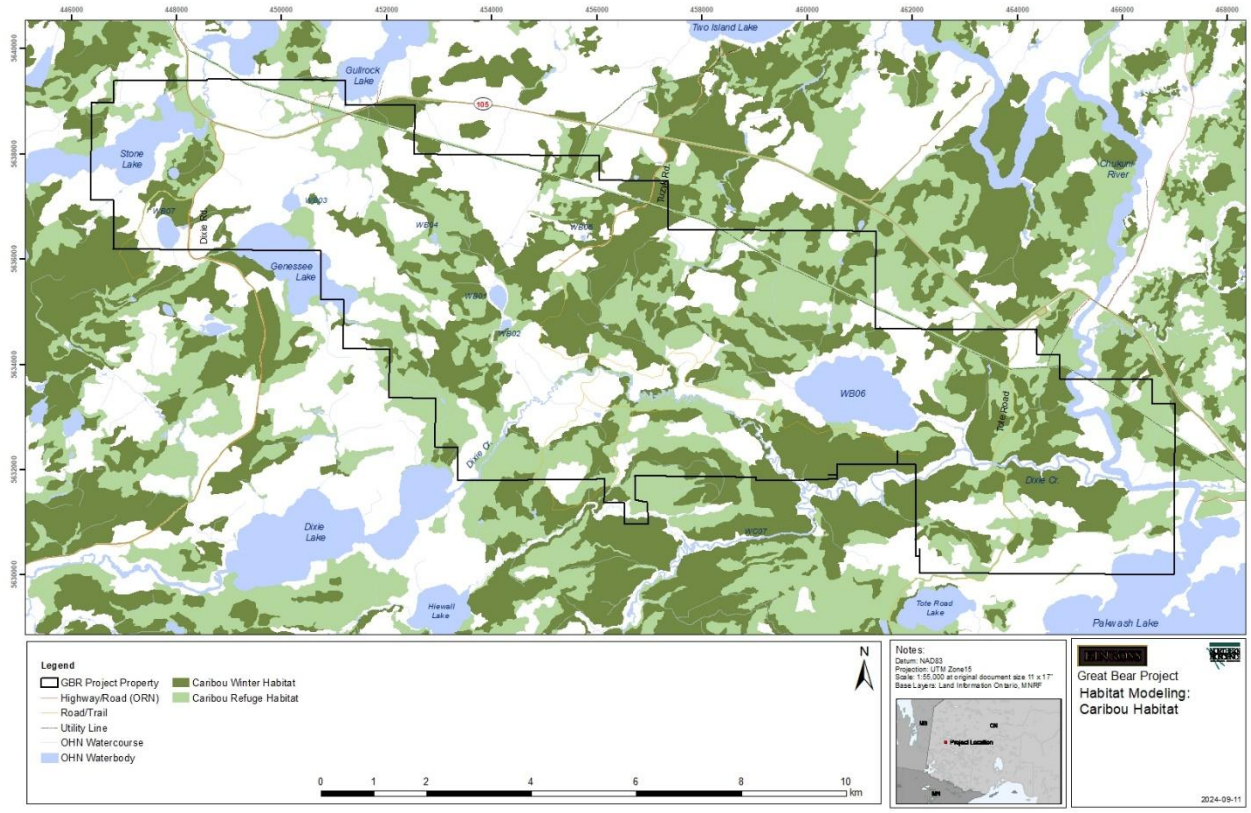


Figure 71. Modeled caribou winter and refuge habitat in the Great Bear Project area based on OMNRF caribou habitat models and current forest resource inventory.

9.2.1.3 Disturbance & Occupancy

OMNR's (2013c) range management approach is intended to ensure caribou persistence through the management of caribou ranges, sub-range habitat features and a precautionary approach to land use and resource development decisions relative to the degree of risk to caribou and overall range condition. Overall range condition is evaluated, in part, through the analysis of natural (e.g., wildfire) and anthropogenic (roads, development) disturbance across the range. The use of disturbance thresholds (Sorenson et al. 2008) was also used by Environment Canada (2008, 2011a, b) in their meta-analysis of woodland caribou critical habitat. Environment Canada found that there ranges with less than 35% total disturbance are associated with at least a 70% probability of stable or increasing caribou population growth. According to its range assessment (OMNRF 2014c), the Sydney Range is approximately 7,500 km^2 in size, of which approximately 63% is disturbed (i.e., <36 years of age). Extensive 2021 wildfire in WCPP[19] and adjacent lands may have significantly impacted available caribou in the Sydney Range and actual proportion disturbed may now be much higher. Much of the Great Bear Project claims are within 500 m of existing anthropogenic disturbance and would already be considered disturbed[20] by OMNRF and Environment Canada caribou habitat models.

[19] https://www.lioapplications.lrc.gov.on.ca/ForestFireInformationMap/index.html?viewer=FFIM.FFIM
[20] i.e., anthropogenic disturbance (e.g., clearings, trails) and forest <36 years of age + 500 m buffer for both

9.2.1.4 Habitat Categorization

In addition to overall range condition and population size and trend, OMNRF's range management approach requires that sub-range caribou habitat features be considered when assessing impacts from proposed development. OMNRF's (2013b) *General Habitat Description for the Forest-dwelling Woodland Caribou* identifies three different categories of caribou habitat at the sub-range scale:

- **Category 1.** Habitat features or areas anticipated to have the lowest tolerance to alteration before their function, or usefulness, in supporting caribou is compromised.
- **Category 2.** Habitat features or areas anticipated to have a moderate tolerance to alteration before their function is compromised.
- **Category 3.** Habitat features or areas anticipated to have the highest tolerance to alteration before their function is compromised.

Habitat categorization for the Great Bear Project area has been conducted by OMNRF (Figure 72). The immediate landscape of the Great Bear Project is classified as Category 3, which has the most tolerance to disturbance. Category 3 habitats are typically young, disturbed, and have high productivity soils with shrub-rich and deciduous-dominated forests that may support higher densities of alternate prey and predators. Caribou typically avoid these areas due to increased risk of predation. Although Category 3 habitat is generally not currently occupied by caribou for long periods of time, caribou may travel through them. Category 3 habitat therefore supports caribou indirectly by maintaining the overall refuge function within the range. These areas have a higher tolerance to alteration when compared to other, currently occupied sub-range habitat features. Permanent or long-term anthropogenic disturbances such as large linear corridors and other disturbances that fragment or alter forest cover composition diminish their present and long-term suitability for caribou. Activities in general protected habitat (Category 3) can continue if the function of these features or areas for caribou is maintained, and individuals of the species are not killed, harmed, or harassed.

No Category 1 habitat is located within 10 km of the Project. According to MECP, development or recreational activities that result in sensory disturbance within 10 km of High Use Areas (Category 1), could potentially displace caribou during these sensitive periods:

- Calving/Nursery Areas (May 1 to July 14 - very low tolerance, July 15 to September 15 - low tolerance),
- Winter Use Areas (December 1 to March 31), and
- Travel Corridors (April and/or November).

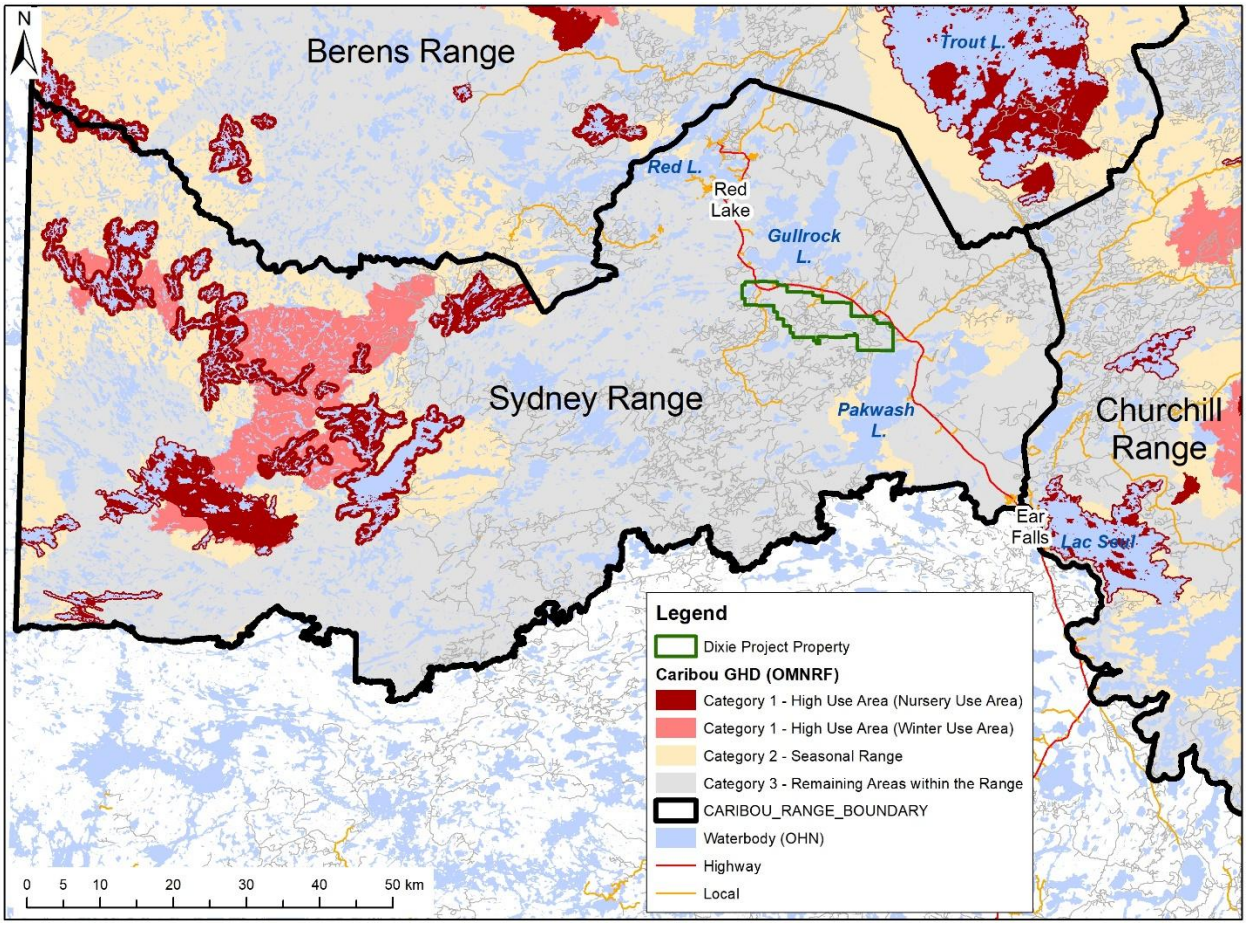
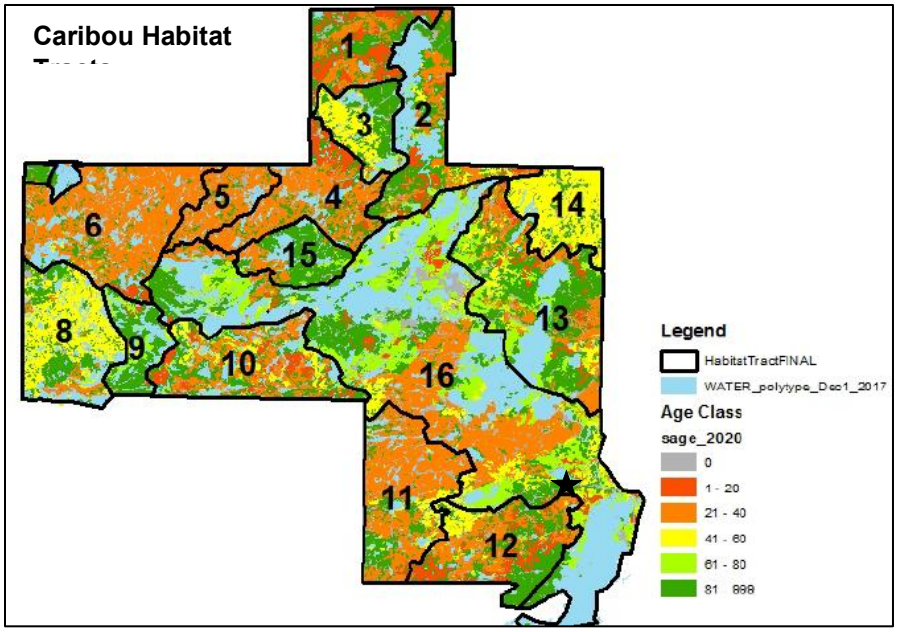


Figure 72. Categorization of woodland caribou habitat in the landscape near the Great Bear Project (OMNRF/OMECP unpublished data).

9.2.1.5 Habitat Tracts

Caribou habitat "tracts" are identified by OMNRF during forest management planning based on potential caribou habitat estimated from a knowledge of wildlife habitat requirements, soils, age class, and tree species (Partridge 2019) (Figure 73). The Gullrock/Pakwash Tract (#16) (Figure 73), which encompasses the Great Bear Project, is delineated around the rich deciduous forests surrounding Red Lake, Pakwash Lake, and Gullrock Lake. These forests are primarily deciduous and mixed wood. This area is highly and permanently disturbed. There are highways, hydro lines, multiple town sites, and mining activities throughout this habitat tract. According to caribou habitat analyses presented in Appendix 1 of the Analysis Package of the Supplementary Documentation for the Red Lake FMP (Partridge 2019), this tract has little evidence of use by caribou and will not provide suitable caribou habitat due to habitat type and development. Caribou habitat tracts are used in planning out the dynamic caribou habitat schedule (DCHS) or "caribou mosaic" which stratifies the forest into areas available for harvest in 20-year periods and provides strategic direction as to the areas and timing of harvest to fulfill caribou habitat needs (Figure 73). The GBR project is within a Z Block, which is not an active part of the DCHS as it is not considered capable of currently supporting caribou.



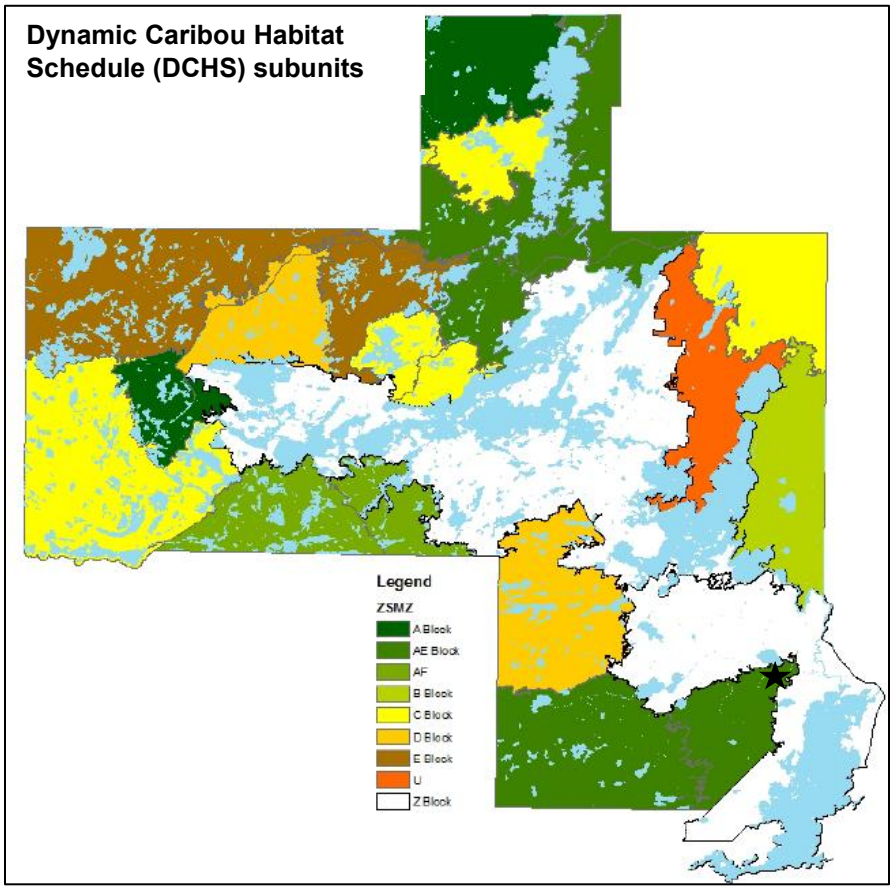


Figure 73. Caribou habitat tracts (upper) and Dynamic Caribou Habitat Schedule subunits (lower) in the 2020-2030 Red Lake FMP (Partridge 2019) in relation to the Great Bear Project (star).

9.2.2 Wolverine

9.2.2.1 Landscape

The Great Bear Project is located near the southern edge of the core range of wolverine in Ontario (Figure 74). Wolverine home ranges are very large, typically 50-400 km2 for females (more restricted during denning periods) and 230-1580 km2 for males (COSEWIC 2014). Home ranges may overlap within and between sexes, but home ranges of reproductive females typically do not overlap (Banci 1994; COSEWIC 2014; OWRT 2013). As a result, wolverines occur at low density, ranging from 5 to 10 individuals per 1000 km^2. Previous telemetry studies of seven wolverine in the Red Lake area (Dawson et al. 2010) found minimum convex polygon home ranges of 2563 (±796 SE) and 428 (±118 SE) for males and females, respectively. This suggests that a relatively small number of wolverines has the potential to use the Great Bear Project site.

Boreal forest with low road densities is suitable habitat for wolverines (COSEWIC 2014; Dawson et al. 2010). This habitat type is found in the landscape surrounding the Project, although much of GBR's Great Bear Project study area has a fairly extensive network of trails and roads from past forest harvest. Available NHIC wolverine records indicate wolverine have used the landscape near the Project site (Figure 75). Given that wolverines can routinely travel over 40 km in a single day, wander widely, and have enormous home ranges (COSEWIC 2014; Scrafford 2019), it is a reasonable expectation that they would at least occasionally use the Great Bear Project area.

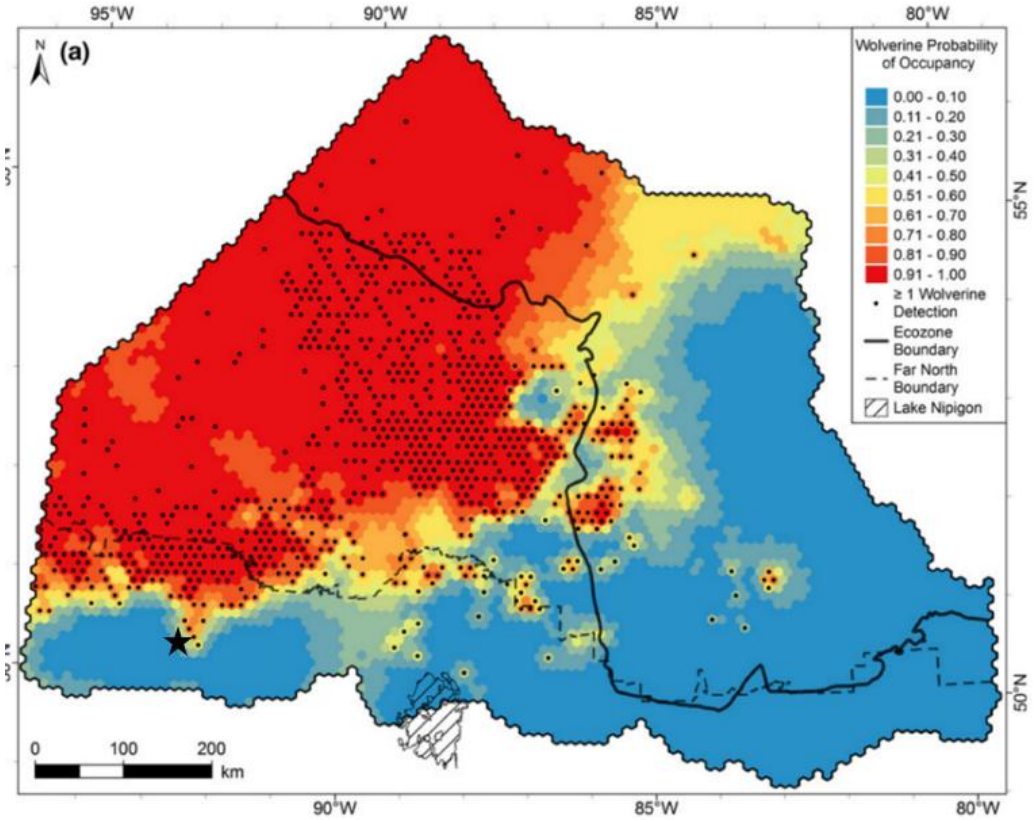


Figure 74. Approximate location of Great Bear Project (star) in relation to modelled probability of occurrence (modified from Ray et al. 2018).

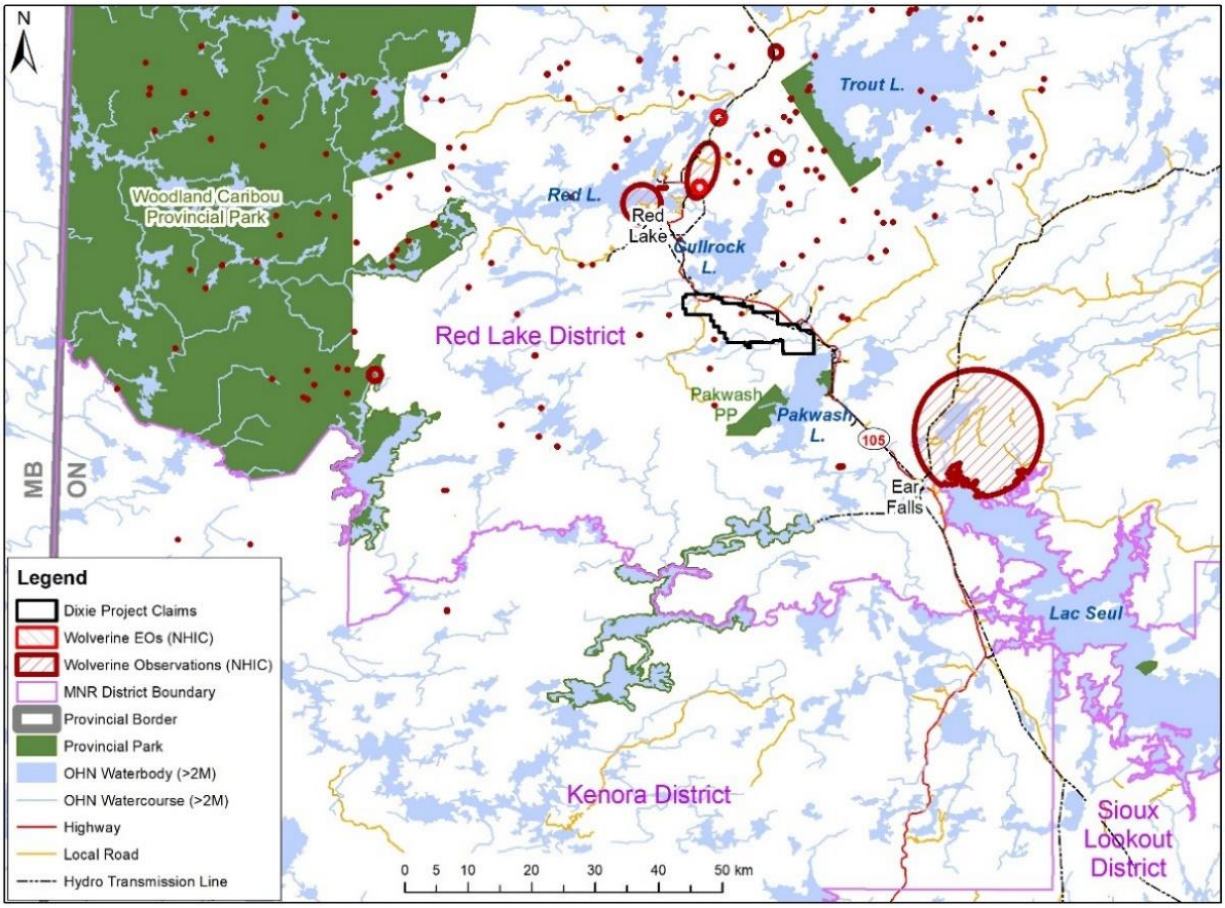


Figure 75. Wolverine observations in the Great Bear Project landscape (OMNRF/NHIC unpublished data).

9.2.2.2 Project Site

Wolverine or their sign were detected multiple locations on the Great Bear property during 2021-2024 fieldwork (Figure 81). Wolverines were detected on trail cameras at 15 occasions at 9 separate locations across the GBR property and in all seasons, including a male ear-tagged by WCS. See Appendix 40 for details of observations and Appendix 41 for representative trail camera photos. No wolverines visited the run pole established south of Dixie Creek in 2021-2023, but a single wolverine visited the 2nd run pole southwest of Teardrop Lake on February 13, 2023 (Figure 79).

Tracks were also observed at one location on Tote Road and the Loop Road as well. Scat that was consistent with wolverine was observed in June 2022 on a north-facing talus slope north of Genessee Lake. Three trail cameras were deployed there in September 2022-July 2023 to determine if there is continued use of this site by wolverine, but none were observed. No wolverine or their tracks were observed during the 2022 aerial survey of this site either, nor was any evidence found during a July 2023 field visit to the talus slope.

Wildlife Conservation Society Canada (WCSC) has been undertaking the Red Lake Wolverine Project since 2018 (Scrafford 2021, Scrafford et al. 2022 WCSC 2021), including the monitoring of 45 individuals (14 F and 31 M) using radio telemetry. During the 2018-2022 period, at least 16 wolverines were observed at or near the Project, including observations of 12 collared wolverines on the GBR property, including 3 females and 9 males (Figure 81). For most of these individuals, the Project represented a very small proportion of their home ranges, as defined by a 95% minimum convex polygon (Figure 82). Four

females were observed home ranges near or overlapping the GBR property (Figure 83), with the Project essentially located between the territory of F07 to the southwest and F01 to the northeast. The territory of F13 is located to the southwest, with F03's completely overlapping the property. As defined by the 95% MCP, the territory of F03 encompasses over 43,000 km^2 which is exceptionally large for a female wolverine, and it unlikely that the property represented a significant part of her home range. Home range sizes for the other three females near the project were approximately 800-1400 km^2. Home ranges of reproductive female wolverines typically do not overlap with those of other females (COSEWIC 2014; OWRT 2013 and references therein), and it is unlikely there was another reproductive female whose territory was centred between F01 and F07 (M. Scrafford pers. comm.).

In contrast, male wolverines may be tolerated within the territories of breeding females and have ranges that overlap with other males as well (COSEWIC 2014). This appears to be the case at the GBR property at least during the 2018-2022 period of the WCS study, where the territories of multiple male wolverines overlapped the Project (Figure 84, Figure 85). In particular, the territory of the males M07 broadly overlapped the GBR property, and there were seven other radio-collared males whose territories also encompassed at least part of the GBR Project. Home range size for the 12 males whose territories were at or near the project ranged from 160 km^2 to 9260 km^2, with a mean of 3014 km^2. Apart from M07, the Project footprint represents a very minor proportion of these males' home ranges.

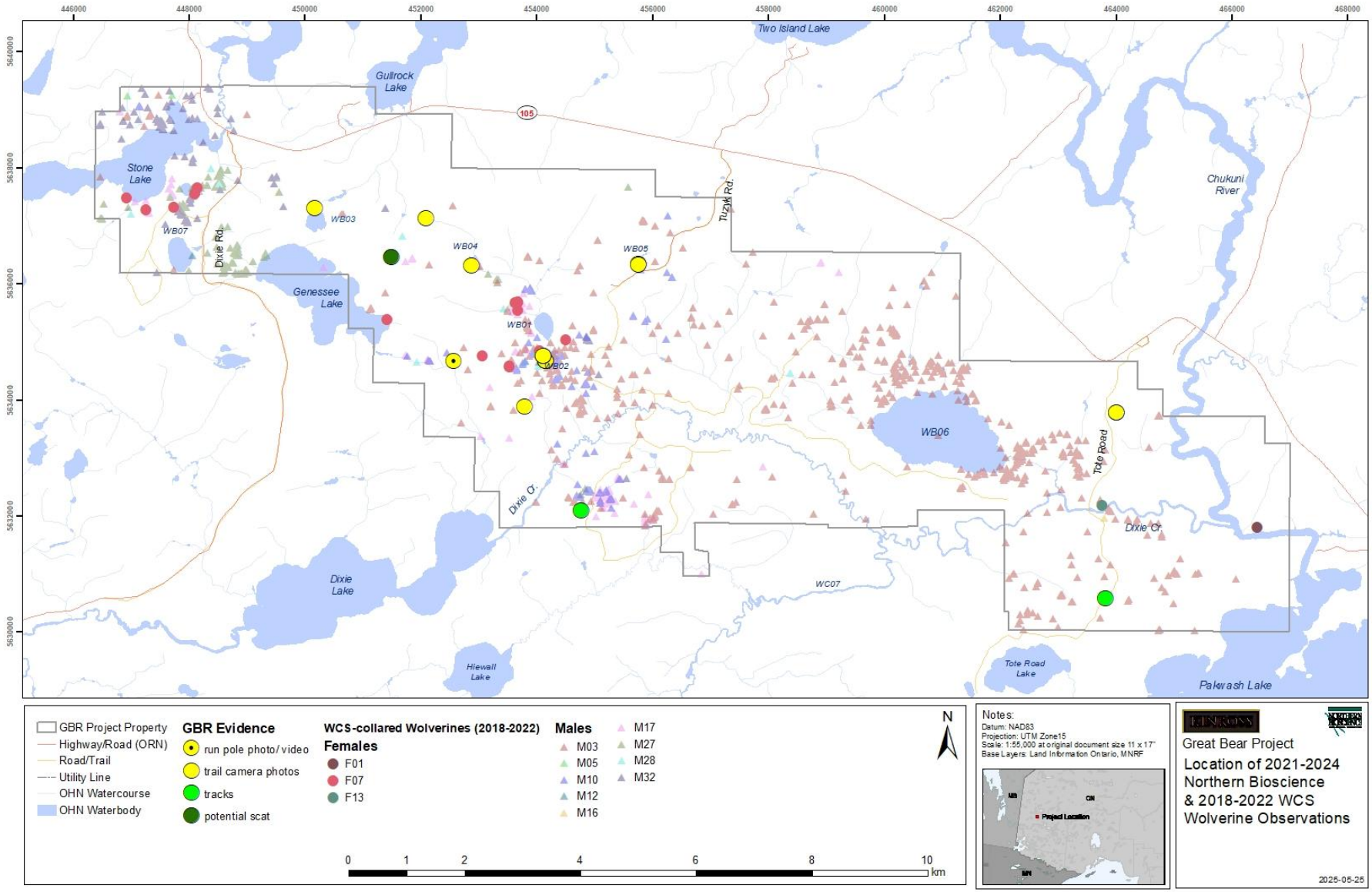


Figure 76. Location of 2018-2022 locations of wolverines radio-collared by Wildlife Conservation Society (WCS) and 2021-2024 observations by Northern Bioscience at the Great Bear project.

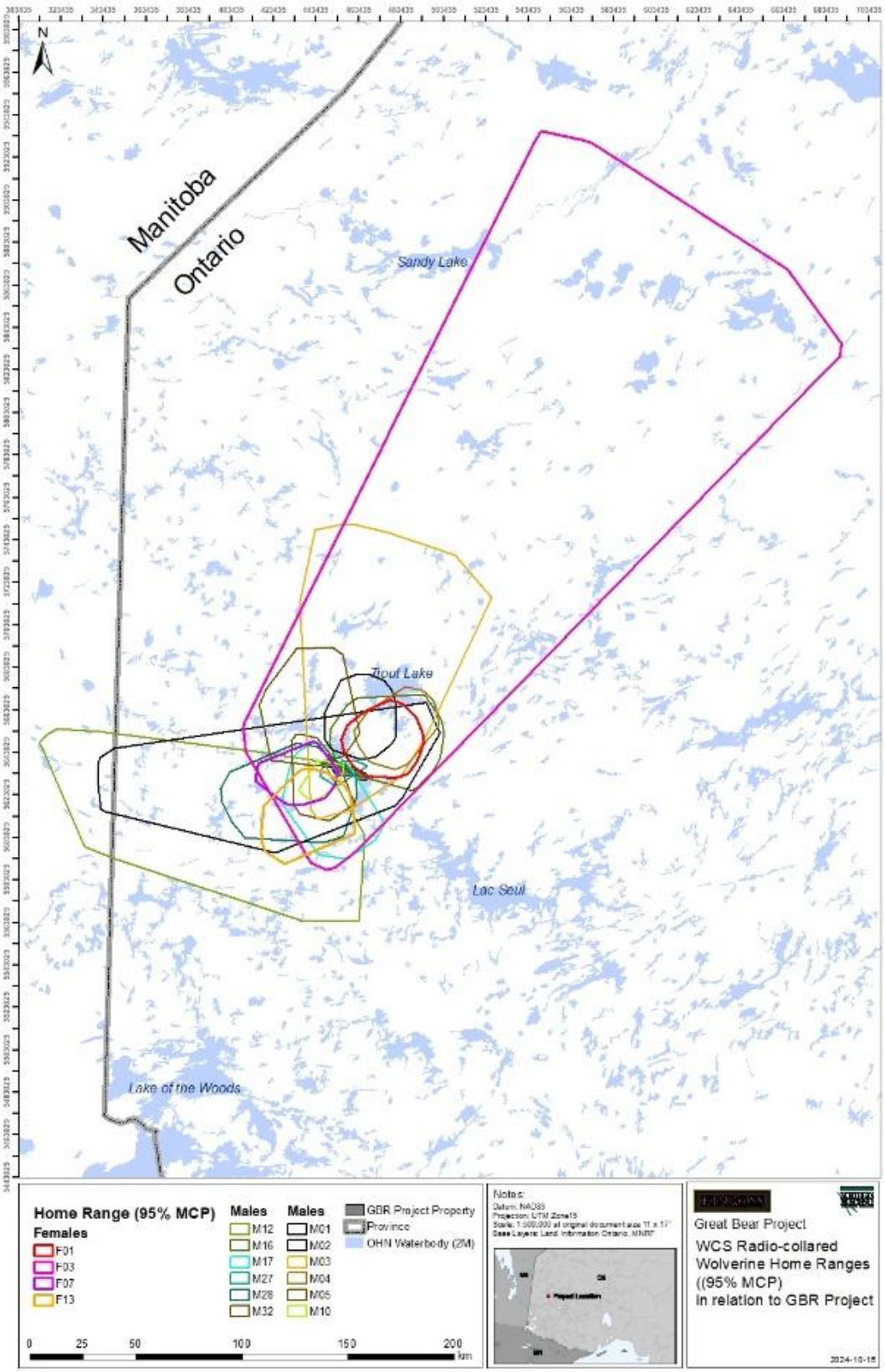


Figure 77. Home ranges (95% Minimum Convex Polygon) near the GBR Project of wolverines collared 2018-2022 by the Wildlife Conservation Society (WCS).

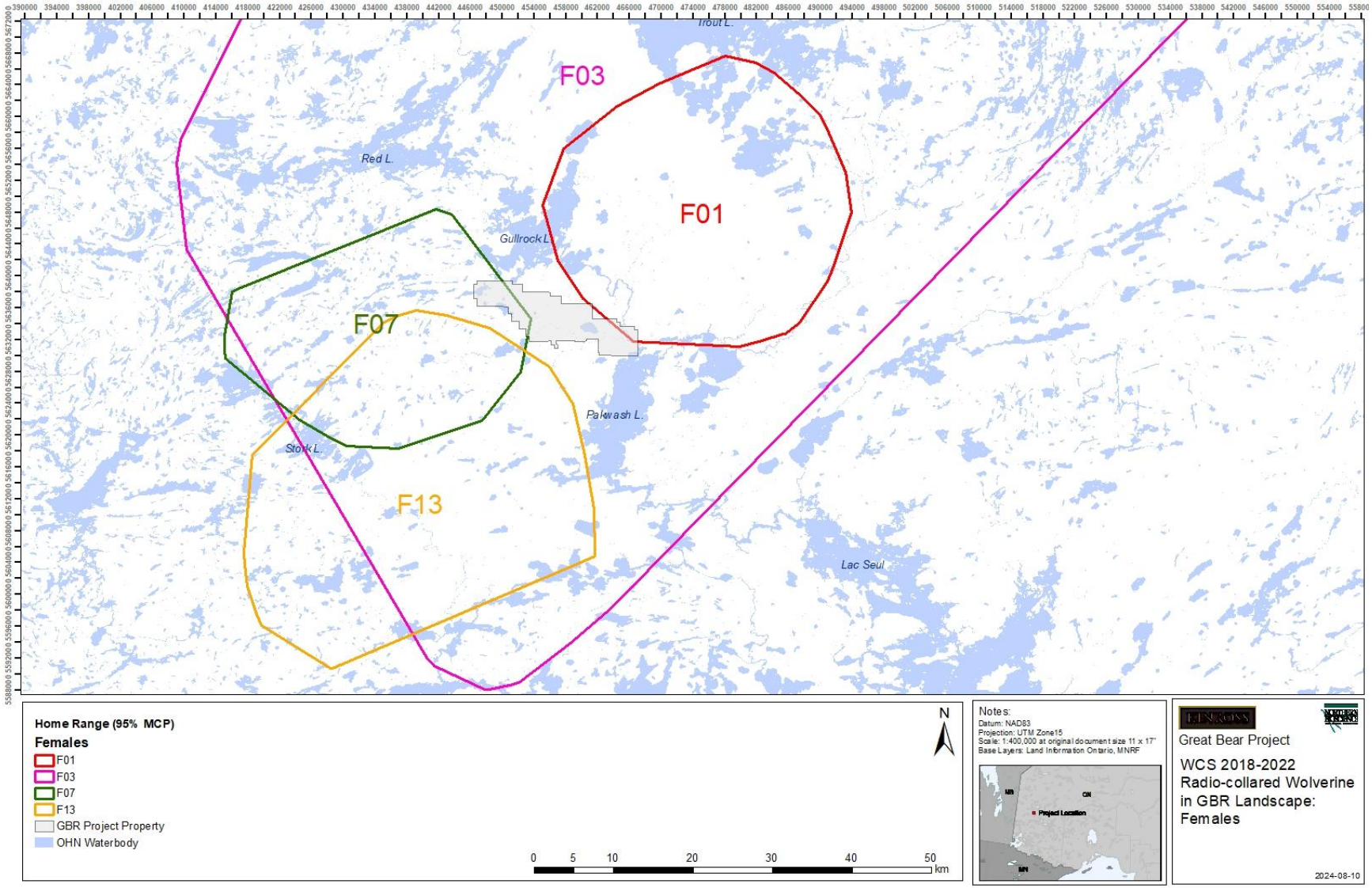


Figure 78. Home ranges (95% Minimum Convex Polygon) near the GBR Project of female wolverines collared 2018-2022 by the Wildlife Conservation Society (WCS).

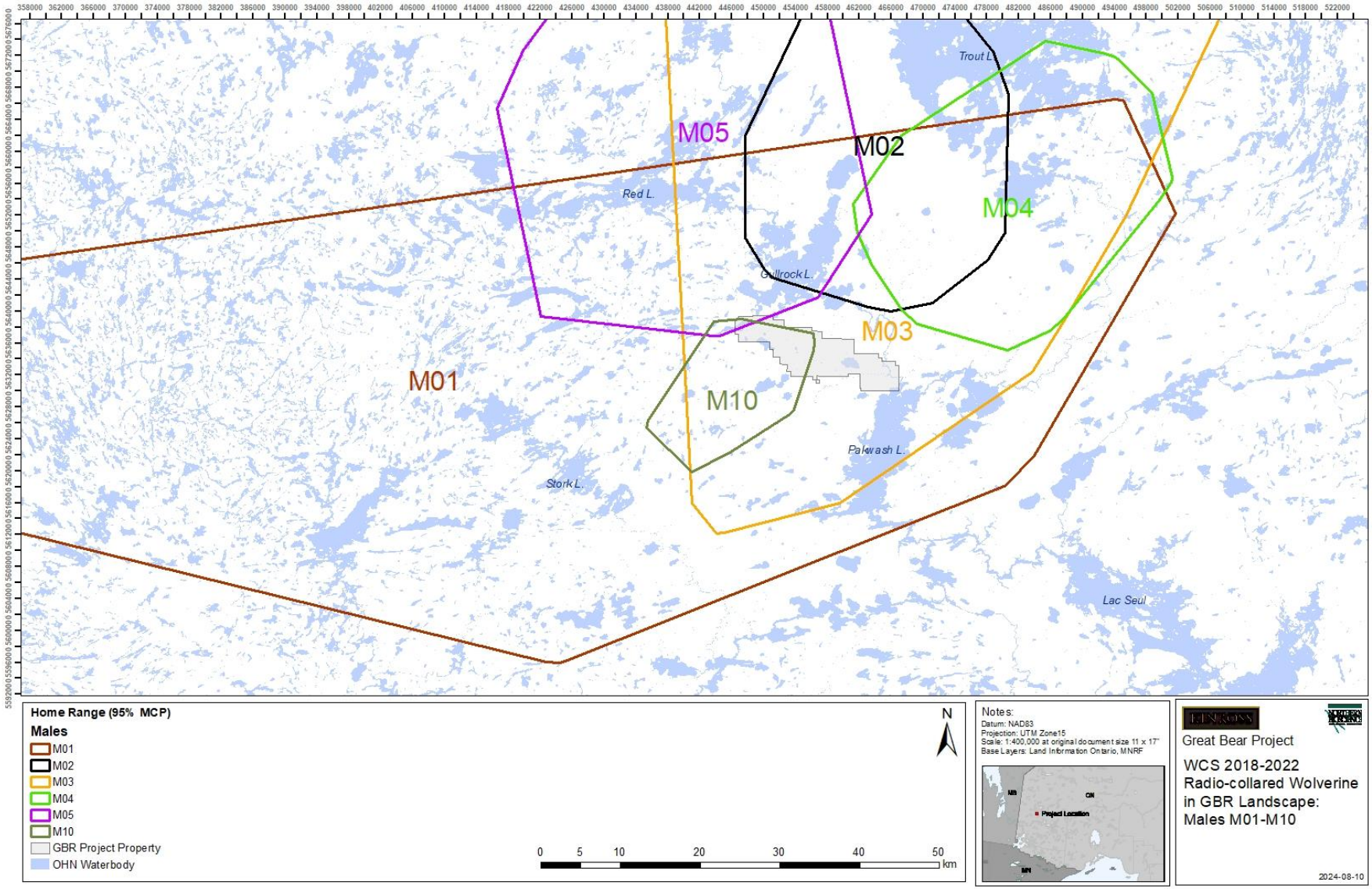


Figure 79. Home ranges (95% Minimum Convex Polygon) near the GBR Project of wolverines (M01-M10) collared 2018-2022 by the Wildlife Conservation Society (WCS).

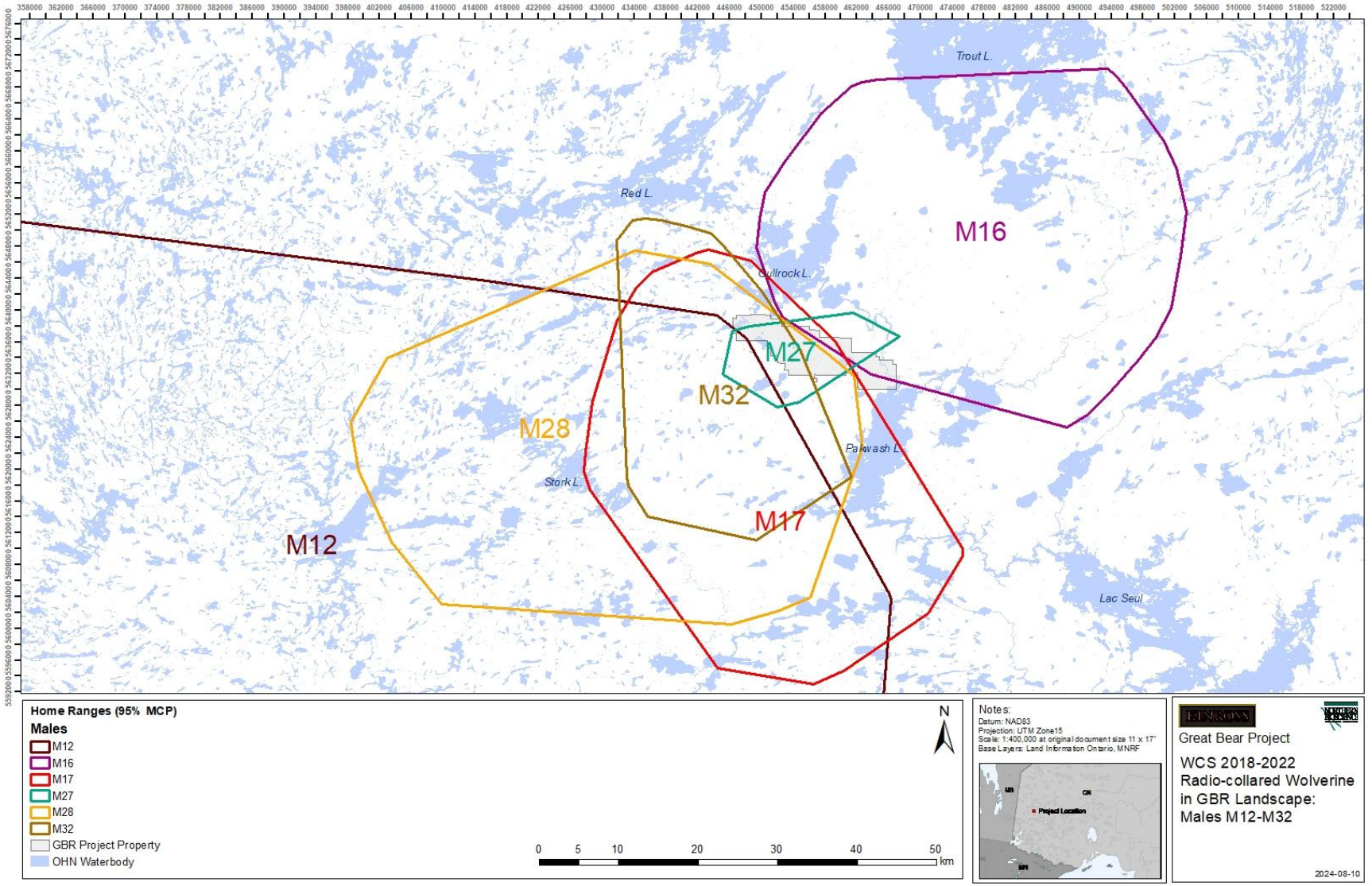


Figure 80. Home ranges (95% Minimum Convex Polygon) near the GBR Project of wolverines (M01-M10) collared 2018-2022 by the Wildlife Conservation Society (WCS).

9.2.3 Bats

Seven species of bats were detected at the GBR property in 2022-2023 (Table 10), representing all known species whose documented Canadian range overlap the Project site (Naughton 2012). Of these, three species (i.e., little brown myotis, northern myotis, and tri-colored bat) are listed as Endangered provincially and federally, mainly due to dramatic declines associated with whitenose syndrome (WNS) (COSEWIC 2013b). Three species of migratory bats (i.e., red bat, hoary bat, silver-haired bat) have recently been assessed as Endangered by COSEWIC (2023) but have not yet been listed under Schedule 1 of SARA, nor have they been listed provincially under the ESA. The remaining species, the big brown bat, is not currently considered at risk but is discussed in this section for convenience.

Table 11. Bat species detected at or near the GBR property in 2022-2023.

Common Name	Scientific Name	SppCode	Status	Movement
Little Brown Myotis	*Myotis lucifugus*	MYOLUC	END	resident
Northern Myotis	*Myotis septentrionalis*	MYOSEP	END	resident
Tri-colored Bat	*Perimyotis subflavus*	PERSUB	END	seasonal migrant
Big Brown Bat	*Eptisicus fuscus*	EPTFUS	NAR	resident
Eastern Red Bat	*Lasiurus borealis*	LASBOR	END	migrant
Hoary Bat	*Lasiurus cinereus*	LASCIN	END	migrant
Silver-haired Bat	*Lasionycteris noctivagans*	LASNOC	END	migrant

9.2.3.1 Foraging Habitat

A total of 74,426 recordings where bats were detected were made on 34 of the 38 ARU deployments[21] in 2022-2023 in the Project AOI, of which 72% (53,467) could be positively identified to species (Table 12). Caution must be used when interpreting these acoustic data, since each call represents a vocalizing bat that passed within 30-50 m of the recorder, and are not absolute abundance data i.e., number of individuals using an area. Nonetheless, the data do provide an index of relative abundance and temporal use in the surveyed areas.

Silver-haired and hoary bats were by far the most commonly detected species, accounting for approximately 70% of all recordings and 95% of all positively identified calls. These two species were also broadly distributed, with detections at 34 operational deployments for both species (Figure 86). Big brown bats were also detected at all 34 operational recorders as well but were much less commonly detected (1.4% of all positively identified calls). Red bats accounted for only 0.3% of bat recordings and were also less widespread, being detected at 24 of 34 operational ARUs.

In comparison, the species that overwinter in northern Ontario, particularly the three SAR bats that are most affected by white-nose syndrome, were the least numerous. Three species of provincially listed Endangered bats (i.e., little brown myotis, northern myotis, and tri-colored bat) may occur at the Project property. Calls identified as little brown myotis were recorded at 32 of 34 operational ARUs (Table 12), accounting for at least[22] 2.0% (n=1464) of all recordings and 2.7% of all positively identified calls. Tricolored bats were identified on only 15 recordings at 9 ARUs and most of these were isolated vocalizations in a sequence of other calls. One tricolored bat was also detected during an in-person survey along Tuzyk's Road (Figure 90). Some of the unknown high frequency calls could also represent tricolored bats, since they can be difficult to differentiate from *Myotis* spp. or red bat. Available evidence indicates this species is present, at least seasonally, in low numbers at the Project site. Northern myotis

[21] 4 ARU deployments for bats had programming/battery issues and were not operational
[22] some of the high frequency bat calls that could not be positively identified to species may represent little brown myotis

were the least commonly detected bat species, with only 8 recordings at four different ARUs. This species was detected three times on July 1-2, 2023, at MiniBat 15 on the Stone River as well as on three separate occasions (May 29, July 4, and July 19) at SM4-02a deployed at the talus slope north of Genesee Lake. This suggests that the AOI is used by few if any northern myotis in any given year.

In-person surveys generally detected fewer bats overall in terms of the number of species and individuals, with 1 of 4 species detected at 94 stations. Hoary bats represented 78 detections, followed by 24 detections of silver-haired bats. On July 5, 2023, a single little brown myotis was detected at one station on both the Tuzyk's and Tote roads, along with one tricolored bat. See Figure 87 to Figure 91 for locations of bats observed during in-person surveys. Multiple passes of silver-haired and hoary bats were sometimes recorded and observed visually during in-person surveys. Only single passes of the little brown myotis and tricolored bats were detected, but their high frequency calls and small size make detection more challenging.

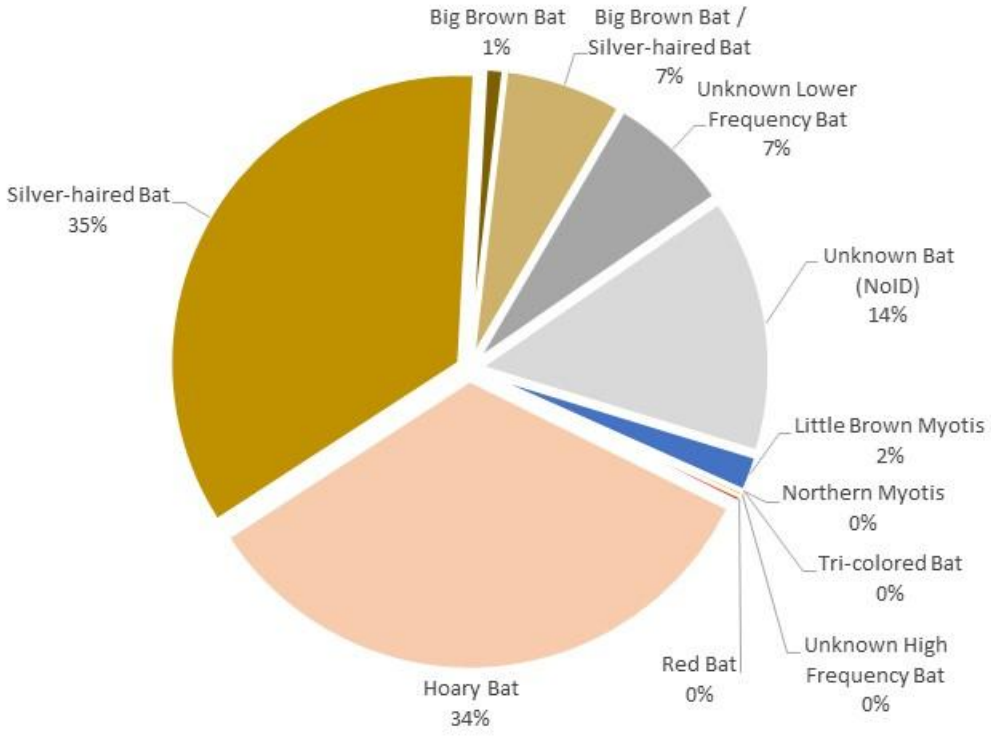


Figure 81. Relative proportion of bat taxa in 74,426 recordings from autonomous recording units (ARUs) at the GBR Project 2022-2023[23].

[23] [1] High Frequency Bats are calls for which no positive ID could be assigned but for which at least one alternate species ID was *Myotis* or *Perimyotis*; Lower Frequency Bats are calls for which no positive ID could be assigned but for which at least one alternate species ID was *Lasiurus, Lasionycteris,* and/or *Eptesicus.* 0% is actually <1%

Table 12. Autonomous recording unit detections of bats within the GBR area of interest during 2022-2023[1].

ARU Deployment	Little Brown Myotis	Northern Myotis	Tri-colored Bat	High Frequency Bat	Red Bat	Hoary Bat	Silver-haired Bat	Big Brown Bat	Big Brown Bat / Silver-haired Bat	Lower Frequency Bat	Unknown Bat (NoID)	All Bats
MiniBat 01a	1			1		160	230	1	36	47	272	748
MiniBat 01b	12		1	11	23	1119	845	10	94	213	326	2654
MiniBat 02a	1				3	1306	232	5	60	137	637	2381
MiniBat 03a	16		1	12	23	1175	1087	16	136	248	444	3158
MiniBat 04a	8				3	325	4358	25	61	145	249	5174
MiniBat 05a	73		1	30	2	460	695	20	158	168	352	1959
MiniBat 06b	48			19	2	1203	230	6	472	199	385	2564
MiniBat 06c	4				2	185	347	1	6	54	91	690
MiniBat 07a	1			4		223	185	5	13	43	102	576
MiniBat 07b	4					104	262	3	24	51	73	521
MiniBat 08b	3				5	492	974	22	19	69	245	1829
MiniBat 09a	2					205	212	10	7	14	77	527
MiniBat 09b	11	1		1	8	2144	218	20	27	119	465	3014
MiniBat 09c	2				4	244	347	3	11	61	101	773
MiniBat 10a						113	237	2	8	44	65	469
MiniBat 11a	29			14	5	996	453	11	197	241	315	2261
MiniBat 11b	2			1	1	208	651	3	40	94	112	1112
MiniBat 12a	75			3	4	1861	1375	67	863	368	778	5394
MiniBat 13a	260		3	15	16	2254	1385	67	362	293	516	5171
MiniBat 13b						568	372	4	43	142	144	1273
MiniBat 14b	151	1		3	13	1381	451	40	20	25	204	2289
MiniBat 15a	9			9	4	876	256	1	131	261	346	1893
MiniBat 15b	45	3		7		156	946	69	132	174	547	2079
MiniBat 16a	38			5	5	507	737	25	80	88	201	1686
MiniBat 17a	1				1	89	161	1	8	52	40	353
MiniBat 18a	1				2	95	160	2	5	37	43	345
MiniBat 29a	379			47	16	1269	1078	46	419	269	565	4088
MiniBat 38a	79				7	2174	1087	46	121	358	539	4411
SM4-01a	33		1	4	25	428	861	92	713	178	876	3211
SM4-02a	74	3	1	14		161	125	7	79	104	240	808
SM4-03a	13		2	2	7	146	219	3	19	69	146	626
SM4-04a	35		2	3	6	560	2360	47	55	132	440	3640
SM4-05a	17			5	1	264	1267	7	327	489	352	2729
SM4-11a	37		3	5	42	1502	1650	57	162	181	381	4020
TOTAL	**1464**	**8**	**15**	**215**	**230**	**24953**	**26053**	**744**	**4908**	**5167**	**10669**	**74426**

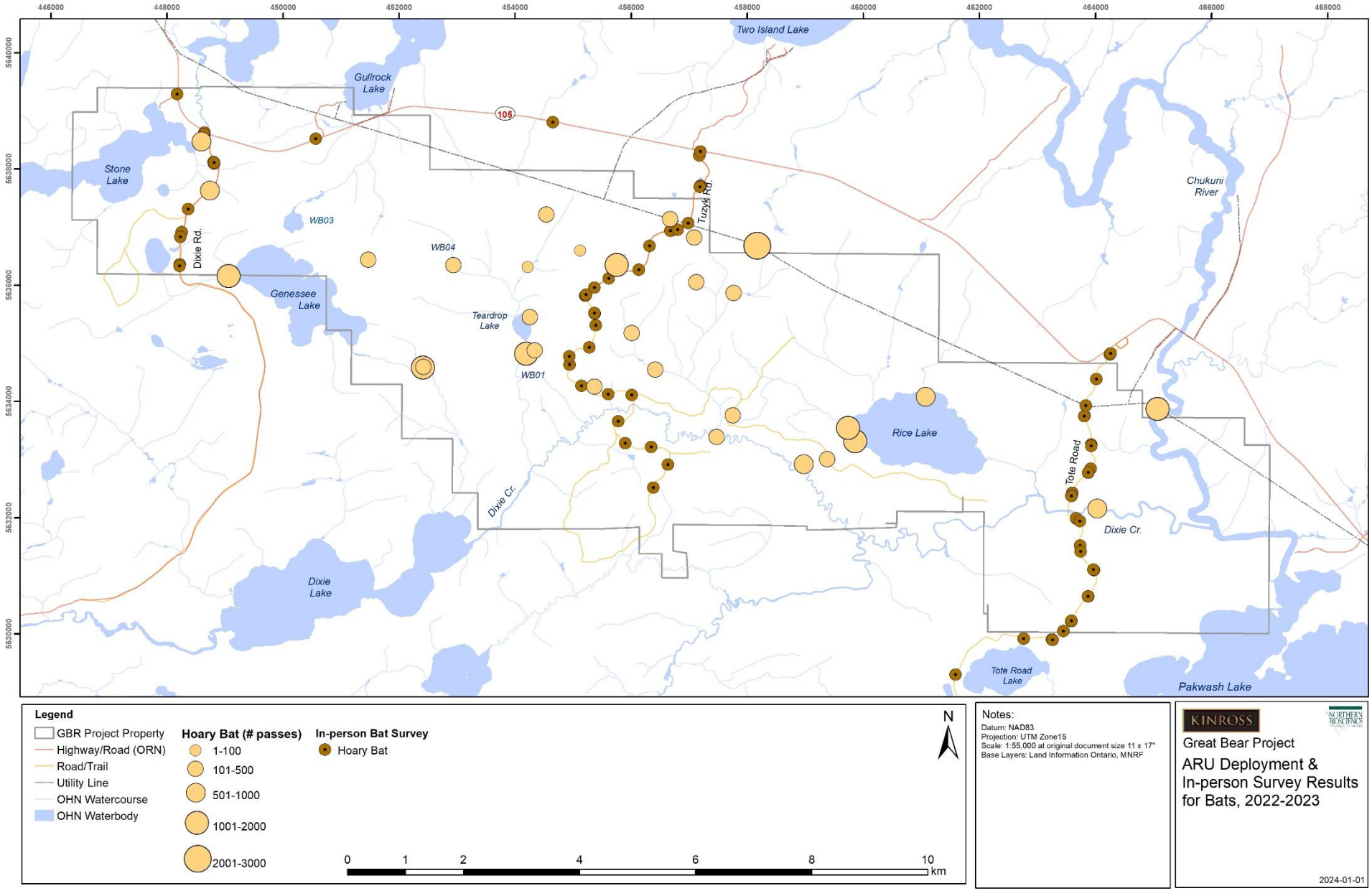


Figure 82. Locations where hoary bats were detected at or near the GBR property.

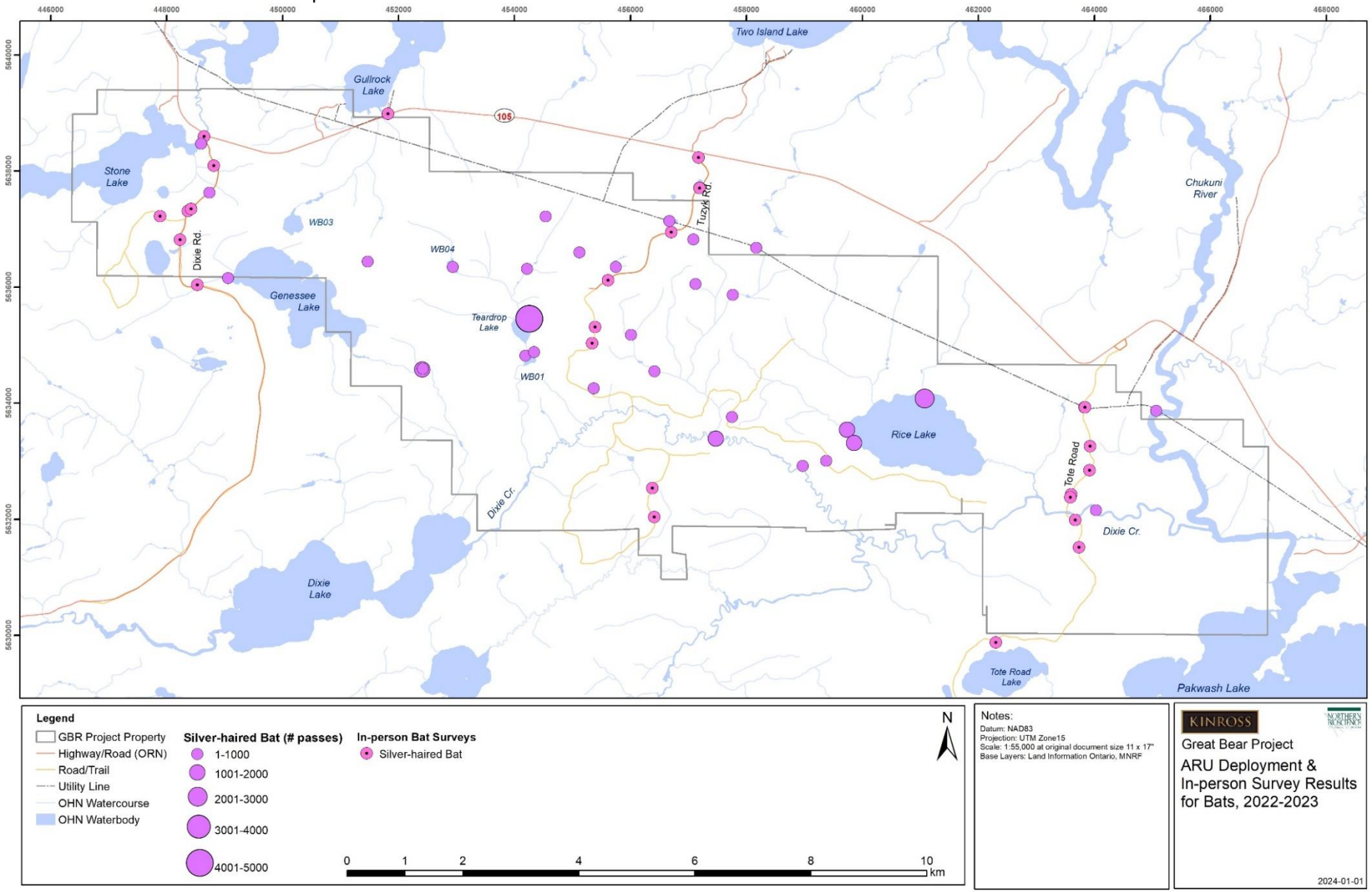


Figure 83. Locations where silver-haired bats were detected at or near the GBR property.

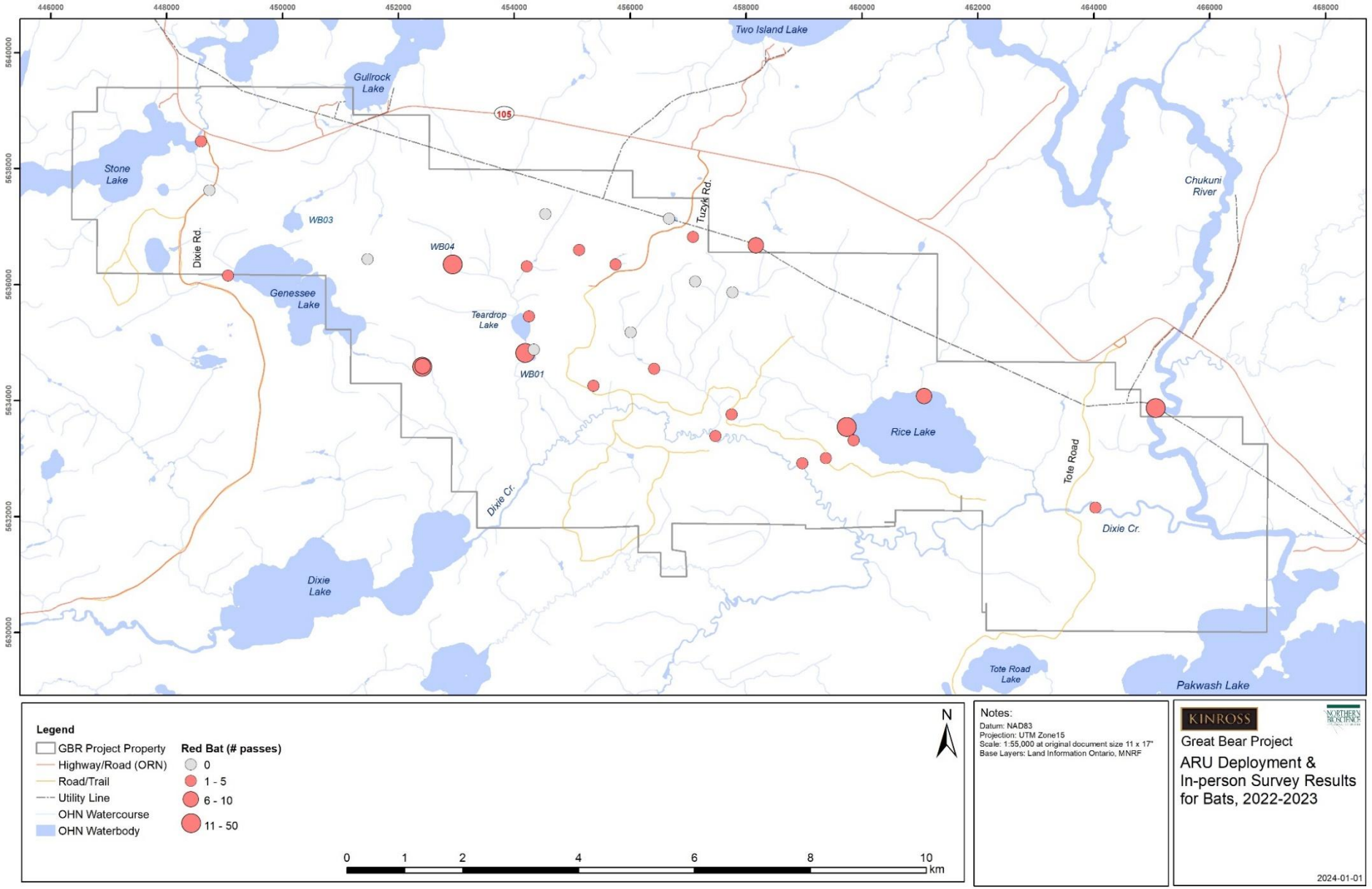


Figure 84. Locations where red bats were detected at or near the GBR property.

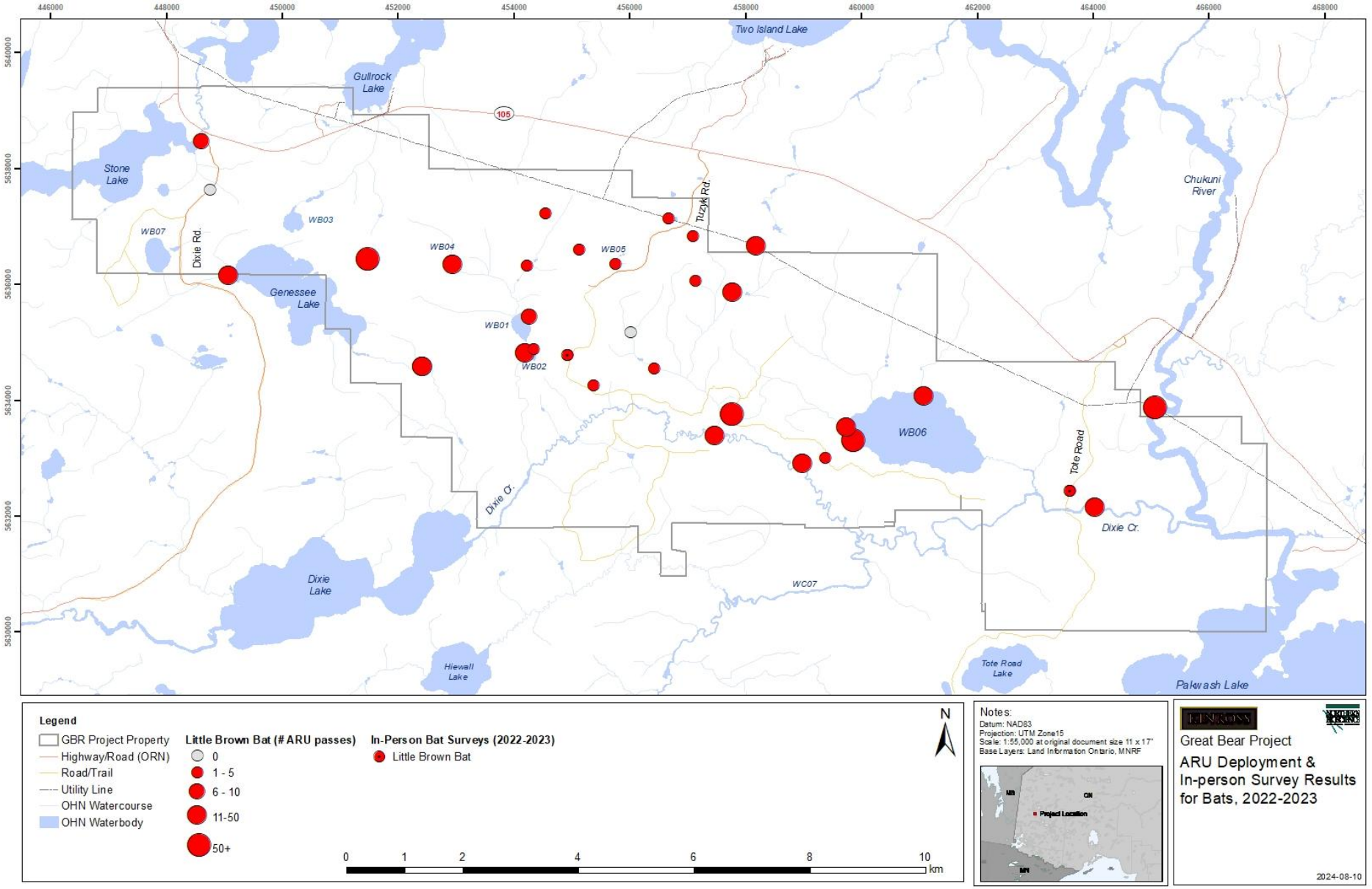


Figure 85. Locations where little brown myotis were detected at or near the GBR property.

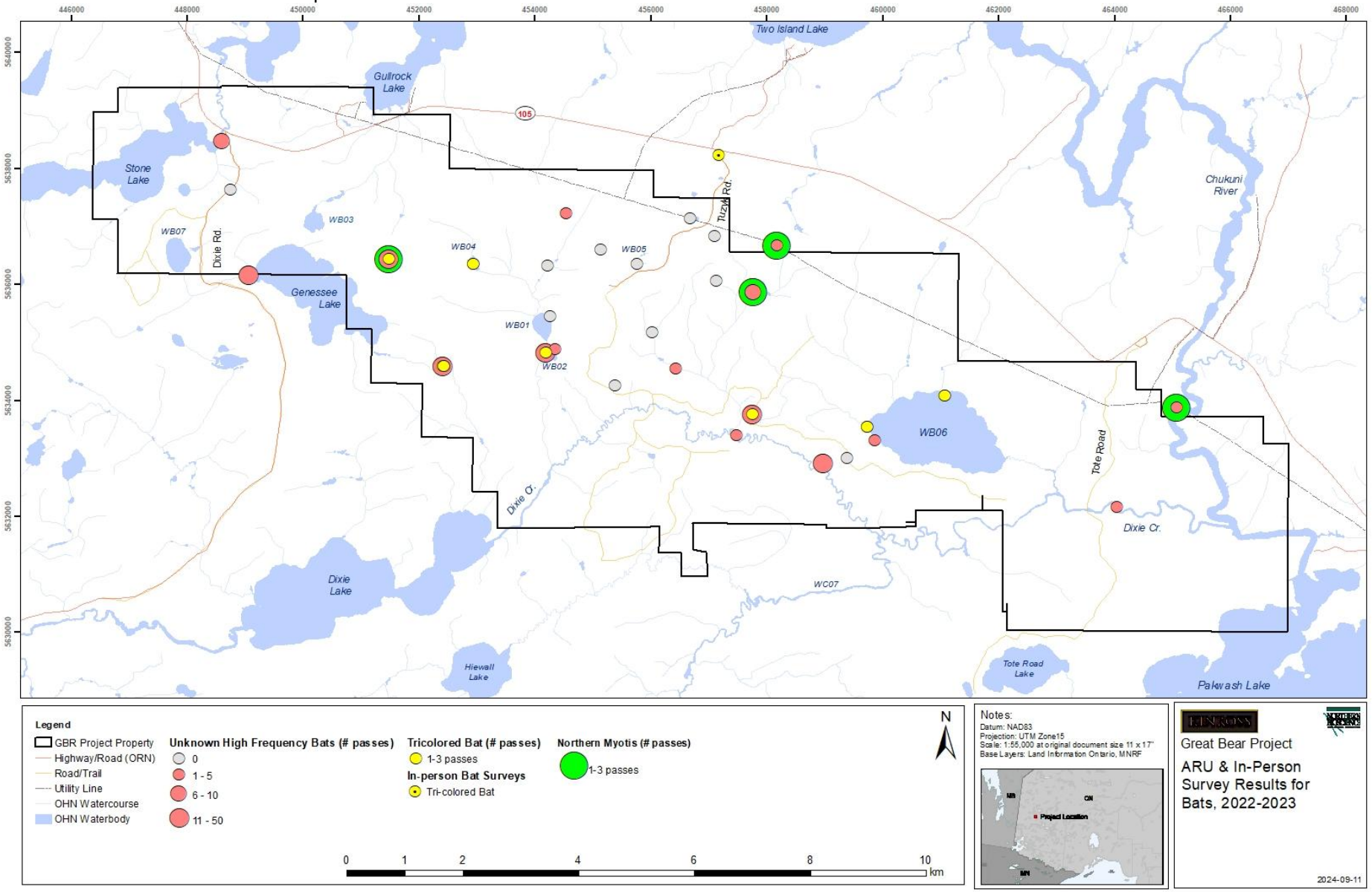


Figure 86. Locations where other high frequency bats were detected at or near the GBR property.

[1] High Frequency Bats are calls for which no positive ID could be assigned but for which at least one alternate species ID was *Myotis* or *Perimyotis*; Lower Frequency Bats are calls for which no positive ID could be assigned but for which at least one alternate species ID was *Lasiurus, Lasionycteris,* and/or *Eptesicus.*

9.2.3.2 Roosting Habitat

No roosting bats, maternity colonies, or potentially suitable large-diameter trees with cavities were observed during 2021-2023 fieldwork. Only 15 snag trees were observed on 141 survey plots in 2021, typically with only small cavities from woodpecker activity. No large cavities or concentrations of snags were observed. No suitable bat roosts were identified in 2023 on the approximately 250 plots conducted concurrently with morning avian point counts (Appendix 10).

During the summer, nursing females of little brown myotis and northern myotis aggregate in colonies dozens to thousands of individuals (depending on the species) in warm locations usually in or around buildings, but also tree cavities, exfoliating bark, cracks and crevices in cliffs. Northern myotis, which typically have smaller colonies, switch maternity roosts every several days, carrying their non-volant young with them (Naughton 2012). During the summer, non-nursing bats roost singly or in groups during the day and at night when not foraging. Depending on the species, roost sites can include hiding amongst foliage in trees, under boulders, in tree cavities, caves, rock crevices, and buildings; some roosting habitat may be therefore present but undetected in the Project AOI. Summer roosts of tri-colored bats are poorly known, but where anthropogenic structures are lacking, they may use dead clusters of leaves on trees, particularly those with large clumps of arboreal lichens (COSEWIC 2013b). A lack of suitable roost sites is thought to limit the distribution of tri-colored bats because they most commonly roost in deciduous trees but they can be flexible when this roost type is not available (Carter and Menzel 2007; Layng et al. 2019; Poissant et al. 2010).

Based on the results of the acoustic monitoring, the AOI provides foraging habitat for little brown myotis, particularly near waterbodies and forest openings (e.g., trails). The presence of little brown myotis detected at recorders during the late spring and summer monitoring period suggest that the AOI may provide roosting habitat for males or non-breeding females. However, it is not known any of these passes detected represent breeding female little brown myotis (sex cannot be determined from the acoustic recordings). No anthropogenic structures are present in the AOI that represent what is now typical maternity colony for this species, but the presence of natural maternity roosts cannot be ruled out. Northern myotis are more likely to use natural maternity roosts in suitable trees, but none of the 16,000+ recorded passes was tentatively[24] identified as northern myotis. This lack of activity suggests that there is little if any use of the AOI by northern myotis. Recent acoustic monitoring (Layng et al. 2019) has extended the known northern limit of tri-colored bats in Ontario - this species engages in annual latitudinal migrations, moving north during the summer as James Bay, but returning south to overwinter. Further acoustic analysis of recordings from 2022 is ongoing to confirm if this species is present in the Great Bear AOI.

Roosting habitat is likely not limited in the disturbance-driven boreal forest given the scale of disturbance in the boreal forest from wildfire and commercial forestry, including on the Great Bear property. Very few potentially suitable roost trees were identified during November 2021 snag surveys (Appendix 29).

In addition to being protected habitat under the provincial ESA for most overwintering bat species (all but big brown myotis), hibernacula are also considered SWH.

9.2.3.2.1 Habitat Modeling

According to the most current available MECP guidance (MECP 2022a), potential maternity roost habitat in the boreal zone can include the following ecosites (Banton et al. 2009):

[24] sonograms for this species can be difficult to differentiate from little brown myotis

- G/B015-019 Very Shallow: Dry to Fresh: Mixedwood/hardwood
- G/B023-028 Very Shallow: Humid: Conifer/Mixedwood
- G/B039-043 Dry, Sandy: Hardwood/Mixedwood
- G/B054-059 Dry to Fresh: Coarse: Mixedwood/Hardwood
- G/B069-076 Moist, Coarse: Mixedwood/Hardwood
- G/B087-092 Fresh, Clayey: Mixedwood/hardwood
- B103-108 Fresh, Silty to Fine Loamy: Mixedwood/Hardwood
- B118-125 Moist. Fine: Mixedwood/Hardwood
- B130-133: Swamps

These ecosites may support maternity or day roosts of little brown myotis, northern myotis, and tri-colored bat, including trees less than 25 cm DBH (OMECP 2022b). Based on MECP's habitat suitability model, there are approximately 2500 ha of habitat on the GBR property that is potentially suitable for roosting by these bat species, particularly in the western and eastern portions of the property (Figure 92).

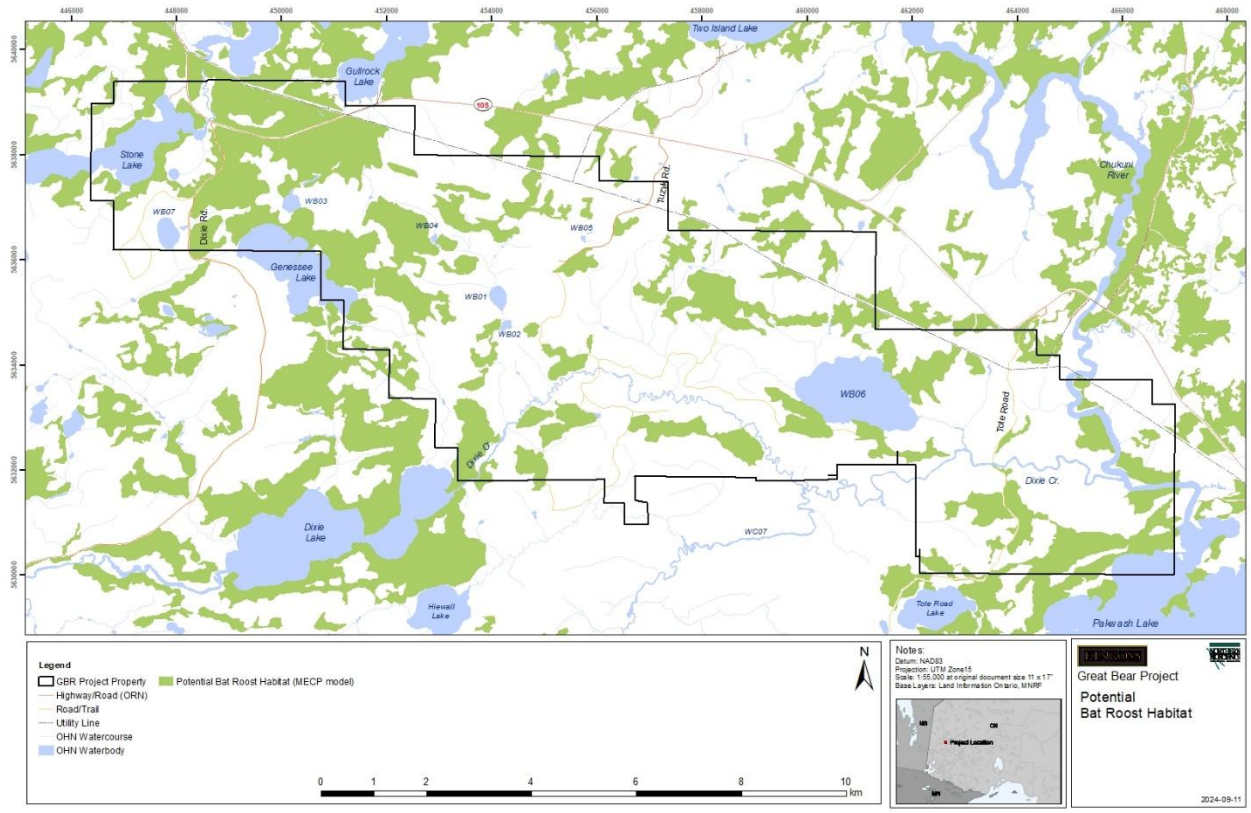


Figure 87. Ecosites that potentially support bat roosts in the GBR area.

9.2.3.3 Hibernacula

Little brown myotis and northern myotis typically hibernate in abandoned mine shafts or caves (Naughton 2012). No mine adits or natural caves were observed during 2021-2023 fieldwork, despite targeted searches for potentially suitable crevices or talus in areas of the AOI with bedrock exposure. An ARU (SM4-NB 02a) deployed at the small rock face and associated talus north of Genesee Lake (Figure 8, Appendix 8) showed some use by little brown myotis (Table 12) but no peaks of use in early spring or fall indicative of swarming or overwintering in the area. No adits (that could be potential hibernacula) are indicated for the Project AOI in the Ontario Ministry of Mines' *Abandoned Mine Information System* (OMM 2024).

Little brown myotis migrate up to 1000 km between summer ranges and winter hibernacula (Naughton 2012), so their presence during the summer does not necessarily indicate the presence of hibernacula at or near the Project site. Movement of approximately 50 km from summer range and hibernacula have also been documented for northern myotis (Naughton 2012). White-nose syndrome is the main reason for the decline in these two species, with the fungus responsible having been reported from northwestern Ontario and southern Manitoba (OMNRF 2015a; WNSRT 2022). In addition to being protected habitat under the provincial ESA for most overwintering bat species (all but big brown myotis), hibernacula are also considered SWH.

9.3 Avian SAR

A total of 13 at-risk bird species have been confirmed in the Great Bear AOI as depicted on Figure 93 and discussed below.

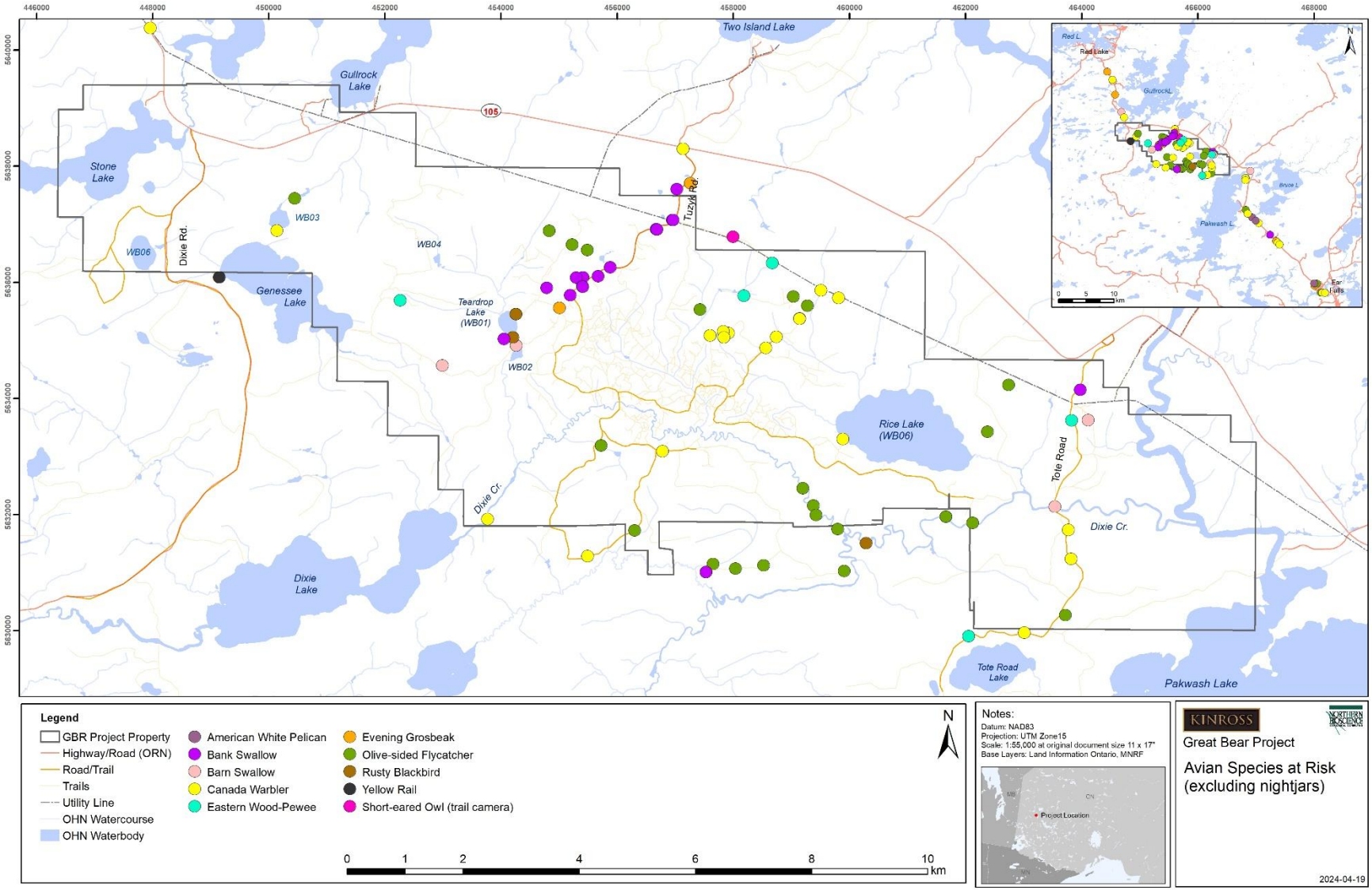


Figure 88. Bird species at risk (excluding nightjars) observed in the Great Bear AOI in 2021-2023.

9.3.1 Nightjars (Eastern Whip-poor-will & Common Nighthawk)

Eastern whip-poor-will and common nighthawk (collectively known as “nightjars”) were confirmed from the Great Bear AOI primarily during crepuscular and nocturnal surveys (Appendix 42) and through use of ARUs (Appendix 43). Observations of both species are shown on Figure 94.

Eastern whip-poor-will were heard on 12 occasions on five nights from June 9 to July in 2022-2023 at six stations along Dixie Road N and adjacent Highway 105. Eastern whip-poor-will were also detected on six locations on ARUs deployed in 2022-2023, including numerous times at Micro 07b deployed approximately 330 m west of Waterbody WB03. This is the location where an adult whip-poor-will was flushed during the day by a field crew on foot on May 22, 2022. The habitat was aspen mixedwood with patches of rock outcrop nearby. Whip-poor-wills were observed only along North Dixie Road area and the east of Genessee Lake despite considerable survey and ARU effort elsewhere in the AOI that detected numerous common nighthawks[25]. Multiple OMNRF surveys along has also failed to detect eastern whip-poor-will along Tuzyk’s Road (Hutton pers. comm. 2024).

Common nighthawks were found throughout the AOI from North Dixie Road to Tote Road, including areas with active early exploration. Common nighthawks were detected during nocturnal surveys at seven locations along the Tote Road, Tuzyk’s Road, and one location in a cutover on the Loop Road south of Dixie Creek (. Common nighthawks were observed during standard in-person surveys in both 2022 and 2023 on seven nights from June 3 through July 2. In addition, common nighthawks were detected on 25 locations on ARUs deployed on the Property in 2022-2023, including at least eight occasions with multiple individuals present. In addition, common nighthawks (including at least one pair) were heard on multiple occasions at three ARU deployments (Micro 02b, Micro 16a, MiniBat13a) east of Pakwash Lake along the existing transmission line ROW and Highway 105 (Appendix 13. Autonomous recording units (ARU) deployed in the GBR Project area for birds and amphibians, 2022-2023*.Appendix 13) in June-July 2022. In addition to individuals flying overhead and presumably foraging, vocalizations by single birds and pairs were also heard, both peents and roars, suggesting multiple breeding pairs. A single nighthawk was also opportunistically seen flying above the Tuzyk’s Road laydown area on July 6, 2023, at 20:30 and one was observed sitting on Tuzyk’s Road at 23:25 on June 10, 2022.

See Figure 94 and Appendix 44 for habitat modeling of nightjars in the AOI. There is approximately 5827 ha of potential nightjar breeding habitat on the GBR property, with an additional 112 ha identified as suitable for foraging only. Much of the suitable habitat is in the western half of the property, which coincides with most of the observations for eastern whip-poor-will. In contrast, common nighthawks were more commonly observed east of Tuzyk’s Road. Although the Project landscape may provide potentially suitable breeding habitat for eastern whip-poor-will, it may be occupied only sporadically given the Project’s location near the northern edge of this species’ breeding range in Ontario. The range of common nighthawk extends further north than eastern whip-poor-will and nesting habitat is unlikely to be limiting for this species given the abundance of open habitat from extensive wildfires in the Red Lake area.

[25] indicating appropriate survey methods and environmental conditions

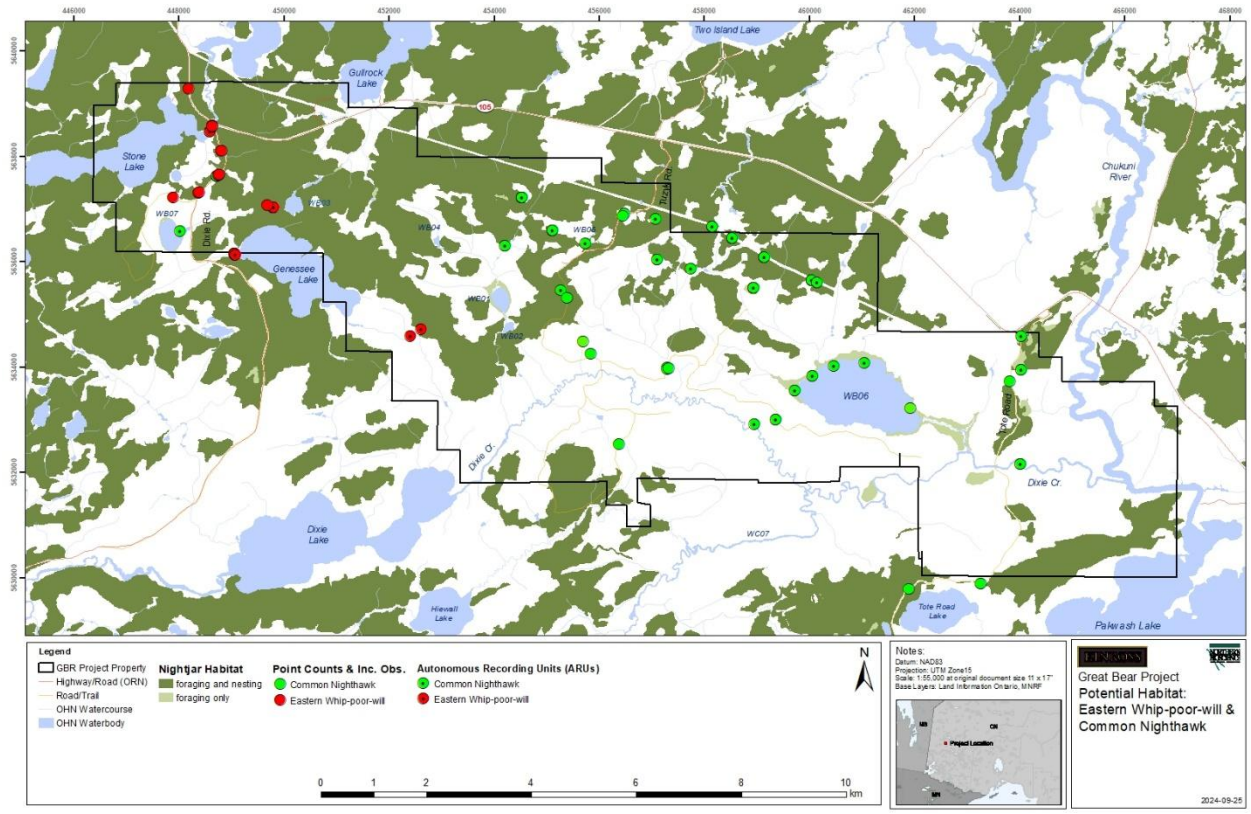


Figure 89. 2022-2023 eastern whip-poor-will and common nighthawk observations and modelled potential habitat in the Project AOI.

9.3.2 Bank Swallow

Bank swallow nest in burrows excavated in vertical or near vertical exposed silty-sandy banks but will use banks with angles from 70-110° (COSEWIC 2013a; Hjertaas 1984; OMECP 2022). In Ontario, nesting habitat is predominately lakeshore bluffs, riverbanks, and sand and gravel pits (Falconer et al 2016; Sandilands 2007a). Sites with low tree and shrub cover on the tops of the banks are also preferred (Hjertaas 1984). As per the General Habitat Description for this species (OMECP 2022), bank swallow habitat is categorized as:

- Category 1: The Bank Swallow breeding colony, including the congregation of burrows and the substrate around them.
- Category 2: The area within 50 m in front of the breeding colony bank face (i.e., the vertical face that is directly associated with and supports the breeding colony) to allow bank swallows to enter and exit burrows.
- Category 3: The area of suitable foraging habitat within 500 m of the outer edge of the breeding colony.

Category 1 habitat has the lowest tolerance to alteration, with Category 3 having the highest.

There is an active bank swallow colony at the LaFarge aggregate pit on the west side of Tuzyk's Road (Figure 95). At least 50 nests were estimated to be active in 2022-2023. A smaller colony with about 13 active nest burrows is found at the smaller aggregate pit on the east side of Tuzyk's Road closer to Highway 105 in 2022; this colony was much larger (30+ pairs) in May 2024 (Figure 95). Bank swallows were often observed foraging overhead during morning point counts near these pits.

No suitable natural nesting habitat for bank swallows has been observed in the AOI, as there are no significant sandy bluff or steep banks along Dixie Creek or other waterbodies in the AOI.

Figure 90. Bank swallows leaving active nests in LaFarge aggregate pit on Tuzyk's Road, June 2022.

Figure 91. Bank swallows at small aggregate pit on east side of Tuzyk's Road, May 2024.

9.3.3 Barn Swallow

Nowadays, barn swallows typically nest in and on anthropogenic structures such as barns and other buildings, bridges, and road culverts (COSEWIC 2011; Heagy et al. 2014). Prior to European colonization, barn swallows nested mainly in caves, holes, crevices and ledges of cliff faces (COSEWIC 2011), but now natural nest sites are rarely used in Ontario (Lepage 2007). Barn swallows prefer foraging in open habitats such as grassy fields, pastures, shorelines, wetlands, and cleared rights-of-way (COSEWIC 2011).

Barn swallows were observed on several occasions foraging on the GBR property, including the Tote Road bridge over Dixie Creek. No evidence of nesting has been found on the GBR property however, despite repeated surveys of the Tote Road bridge in 2022 and 2023, and surveys of anthropogenic structures on site. Approximately ten barn swallows were observed foraging in early June at the Trout River bridge on Highway 105 south of the Project along the potential transmission line route to Ear Falls.

No evidence of nesting has been observed in the AOI however, despite careful nest searches of the Tote Road bridge and other anthropogenic structures on the GBR Property. No suitable natural nesting habitat for barn swallows has been observed in the AOI.

Since its recent downlisting from THR to SC, barn swallow nesting habitat is no longer protected under the provincial ESA. However, nests are still protected under the MBCA and may be considered SWH.

9.3.4 Canada Warbler

Canada warbler is a relatively common nesting species in the AOI and singing males (Figure 97) were heard on territory at more than 30 locations on the property or along Highway 105 in 2022-2023 (Figure 93). Typical habitat was aspen- or birch-dominated mixedwoods on mesic sites with a dense shrub understory of mountain maple (*Acer spicatum*), beaked hazel (*Corylus cornuta*), and other shrubs. Coarse woody debris was often abundant and is an important habitat component for this ground-nesting species.

Figure 92. Territorial male Canada warbler observed in the Great Bear AOI, June 2022.

See Figure 99 and Appendix 46 for habitat modeling for Canada warbler. Modeling suggests that if aspen-birch hardwoods are preferred Canada Warbler habitat, then there is approximately 2492 ha at the GBR property, and an estimated 2494 ha of other used ecosites. Although the Project landscape provides suitable breeding habitat for this species, not all potentially suitable habitat may be occupied since this species' decline may be at least partly attributable to losses in overwintering habitat in South America (Environment Canada 2016b), rather than limited breeding habitat, at least in northern Ontario.

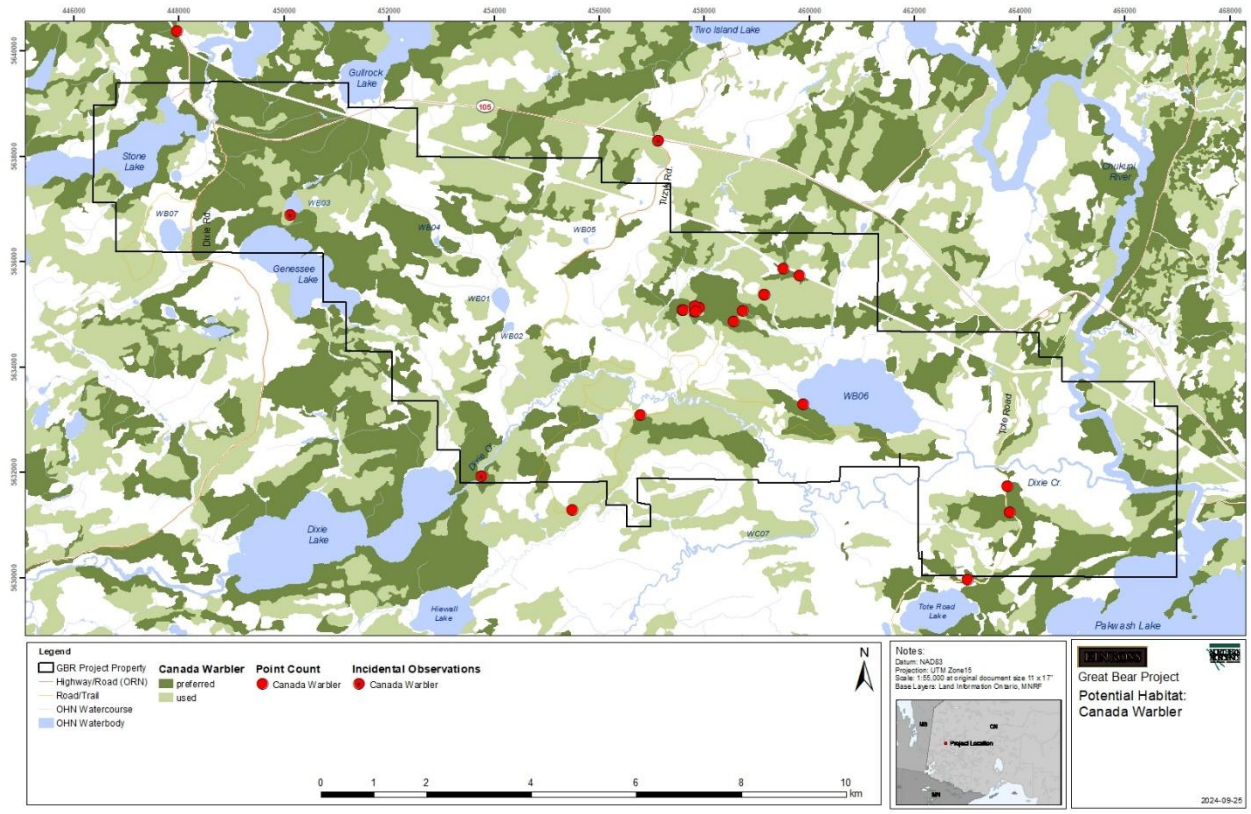


Figure 93. Location of Canada warblers observed at the GBR property and modelled potential habitat.

9.3.5 Eastern Wood-Pewee

A total of five eastern wood-pewees were observed at the Project AOI. One was heard along the Tote Road on June 29, 2022, with another four heard at four other widely separated locations in the AOI in 2023. Typical habitat was mixedwood and deciduous forest near forest access roads, trails, rights-of-way or other openings in the forest.

See Figure 99 and

Appendix 47 for habitat modeling for eastern wood-pewee. Modeling suggests that there may be 5905 ha of potentially suitable breeding habitat for eastern wood-pewee on the GBR property, including 2303 ha preferred and 3602 ha used. Although the Project landscape may provide potentially suitable breeding habitat for this species, it may be occupied only sporadically given the Project's location near the northern edge of this species' breeding range in Ontario.

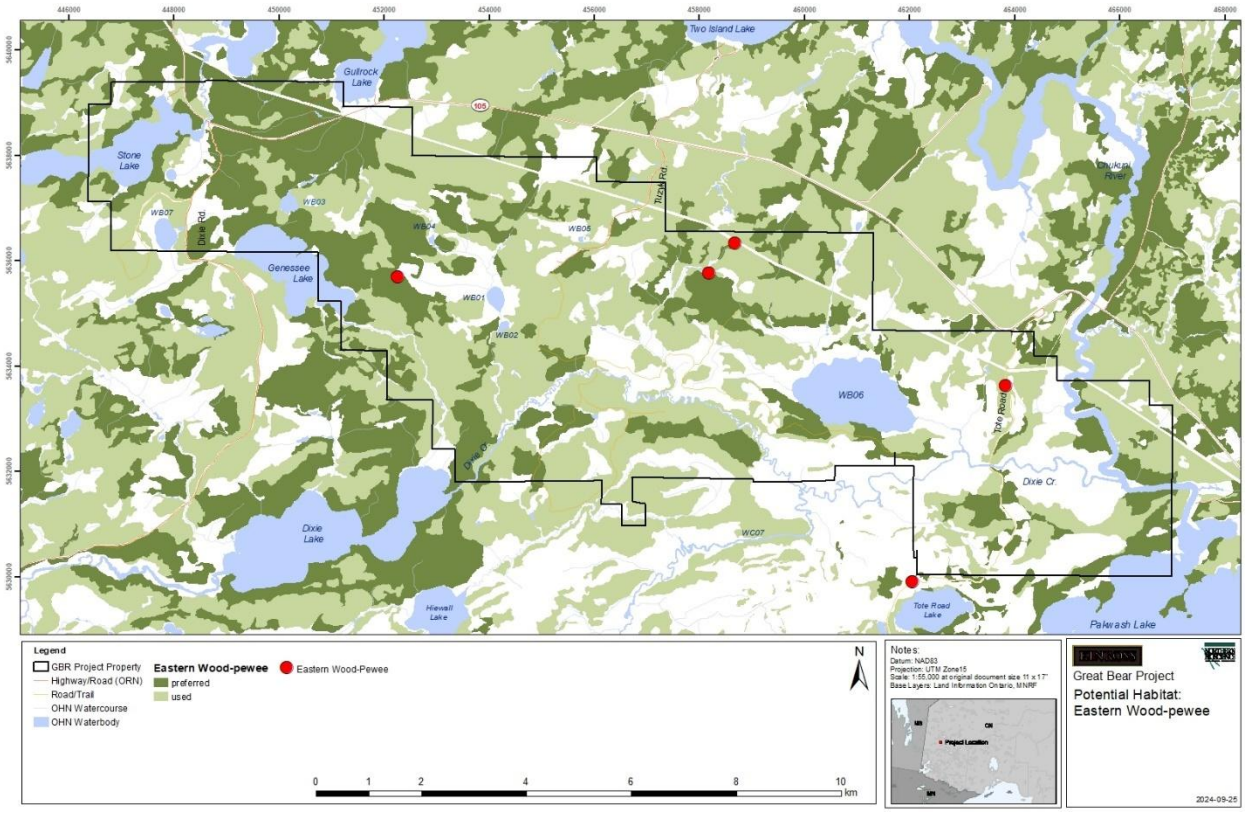


Figure 94. Location of eastern wood-pewees observed at the GBR property and modelled potential habitat.

9.3.6 Evening Grosbeak

Evening grosbeaks were observed at six locations in the Project AOI in 2022 and 2023. From one to four evening grosbeaks were observed during point counts on June 4-10, 2022, at two locations on Tuzyk's Road and three locations along Highway 105 between the Project and Red Lake. None were observed on plots or incidentally in 2023.

See Figure 100 and Appendix 48 for habitat modeling for evening grosbeak. Modeling suggests that there may be 7005 ha of potentially suitable breeding habitat for evening grosbeak on the GBR property. Although the Project landscape may provide potentially suitable breeding habitat for evening grosbeak, it may be occupied only sporadically depending on budworm outbreaks and mast availability.

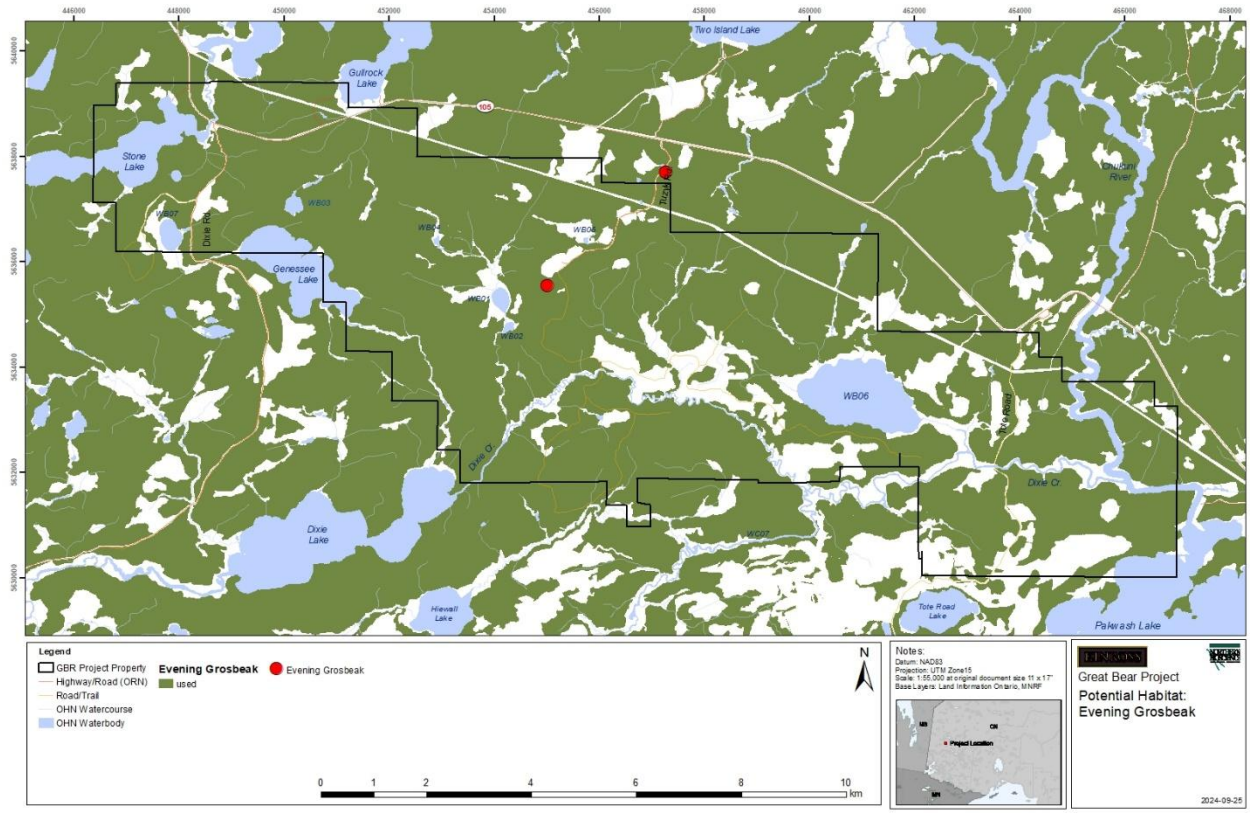


Figure 95. Location of evening grosbeaks observed at the GBR property and modelled potential habitat.

9.3.7 Olive-sided Flycatcher

Olive-sided flycatchers were detected at 26+ locations across the AOI in 2022-23. They were typically observed in cutovers, rock barrens, along Dixie Creek, and other forested edges. See Figure 101 and Appendix 49 for habitat modeling for olive-sided flycatcher. Modeling suggests that there may be 2676 ha of potentially suitable breeding habitat for olive-sided flycatchers on the GBR property, all preferred. Most of the potentially suitable habitat is in the eastern half of the property. Although the Project landscape may provide potentially suitable breeding habitat for this species, it may be occupied only sporadically given the species declining status. Conversely, potentially suitable habitat near the margins of beaver ponds and other small disturbances may not be captured in the model e.g., olive-sided flycatchers were observed west of Tuzyk's road in areas not mapped as potentially suitable habitat. Habitat variables, particularly structural (e.g. exposed snags used as perches for sally foraging) may not be captured in the FRI may help explain this discrepancy.

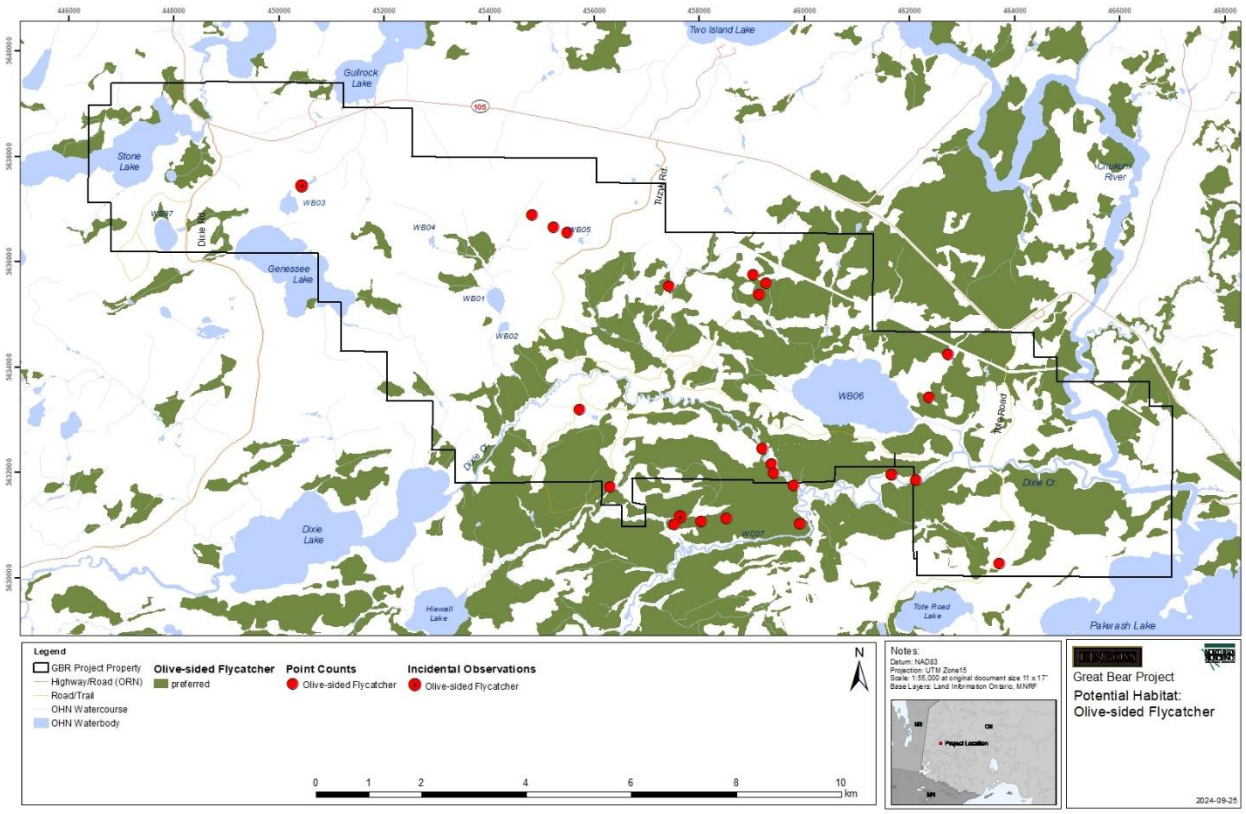


Figure 96. Location of olive-sided flycatchers observed at the GBR property and modelled potential habitat.

9.3.8 Rusty Blackbird

A single rusty blackbird was observed along Dixie Creek on July 1, 2022, and may potentially have bred in the Great Bear AOI. This species typically breeds in conifer swamps and other forested wetlands, often along streams and beaver ponds (Francis 2007). Another lone individual was observed during fall migration along the shores of Teardrop Lake in 2022. A pair of rusty blackbirds was also observed in the conifer swamp along the shoreline of Teardrop Lake on September 26, 2023. It is unsure if they represented a lingering breeding pair or were migrants; despite apparently suitable breeding habitat around the margins of Teardrop Lake, none were observed there during the breeding season, despite point counts and other fieldwork in the immediate area.

See Figure 102 and Appendix 50 for habitat modeling for rusty blackbirds. Modeling suggests that there may be 1586 ha of potentially suitable breeding habitat for rusty blackbirds on the GBR property, including 1006 ha preferred and 580 ha used. Although the Project landscape may provide potentially suitable breeding habitat for this species, it may be occupied only sporadically given the Project's location near the southern edge of this species' breeding range in Ontario.

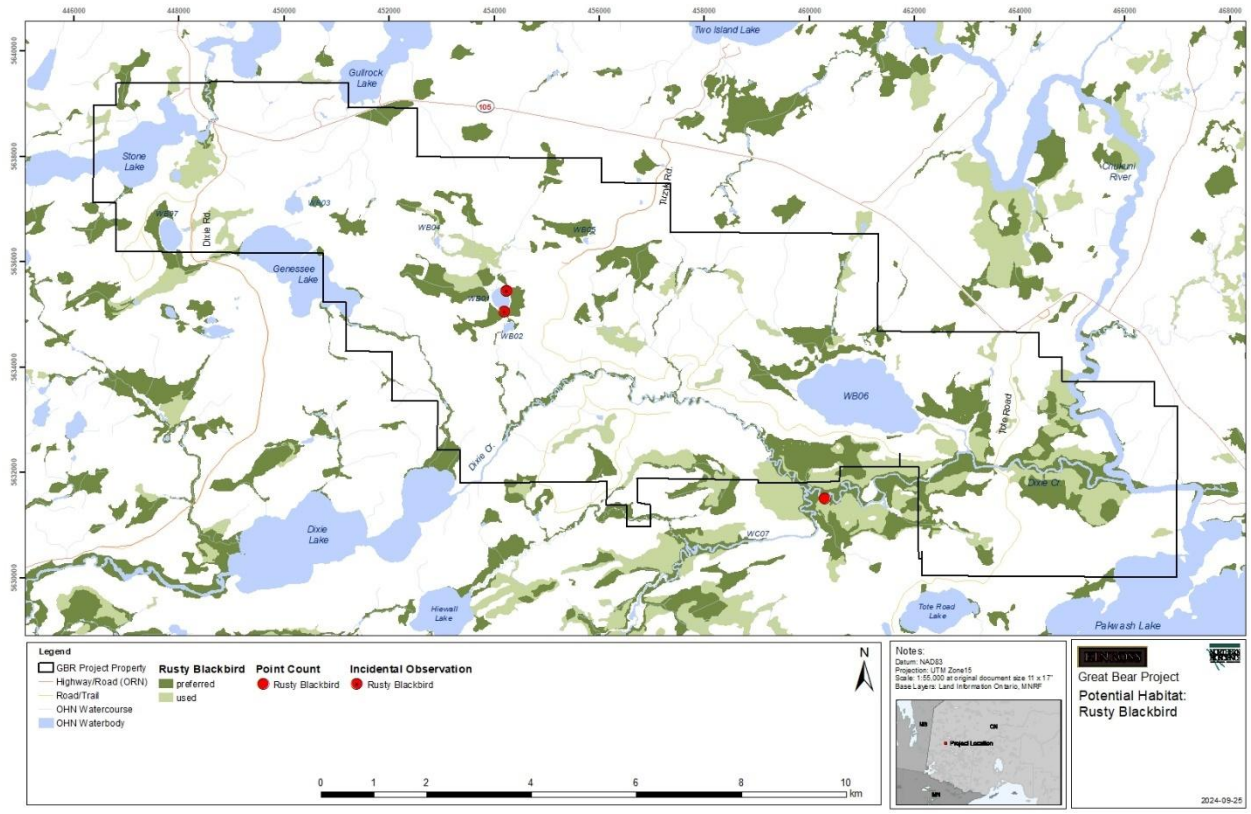


Figure 97. Location of rusty blackbirds observed at the GBR property and modelled potential habitat.

9.3.9 Short-eared Owl

A single short-eared owl was observed on a trail camera on October 17, 2021, along the existing transmission line in the northern portion of the property and was presumably a migrant. No short-eared owls were detected during visual or acoustic surveys for owls or other breeding birds, however.

See Figure 104 and Appendix 51 for habitat modeling for short-eared owls. Modeling suggests that there may be 201 ha of potentially suitable breeding or migratory habitat for short-eared owl on the GBR property, including 62 ha preferred and 139 ha used. Most of the preferred habitat is along the margins of WB06 and its outlet, although no owls were observed in these areas in 2022-2023 despite considerable fieldwork. Large contiguous areas of potentially suitable open habitat are generally lacking on the property and although the Project landscape may provide potentially suitable breeding or staging habitat for this species, it may be used only sporadically given the Project's location outside this species' main breeding range in Ontario.

Figure 98. Short-eared owl recorded on trail camera east of Tuzyk's Road along transmission line ROW.

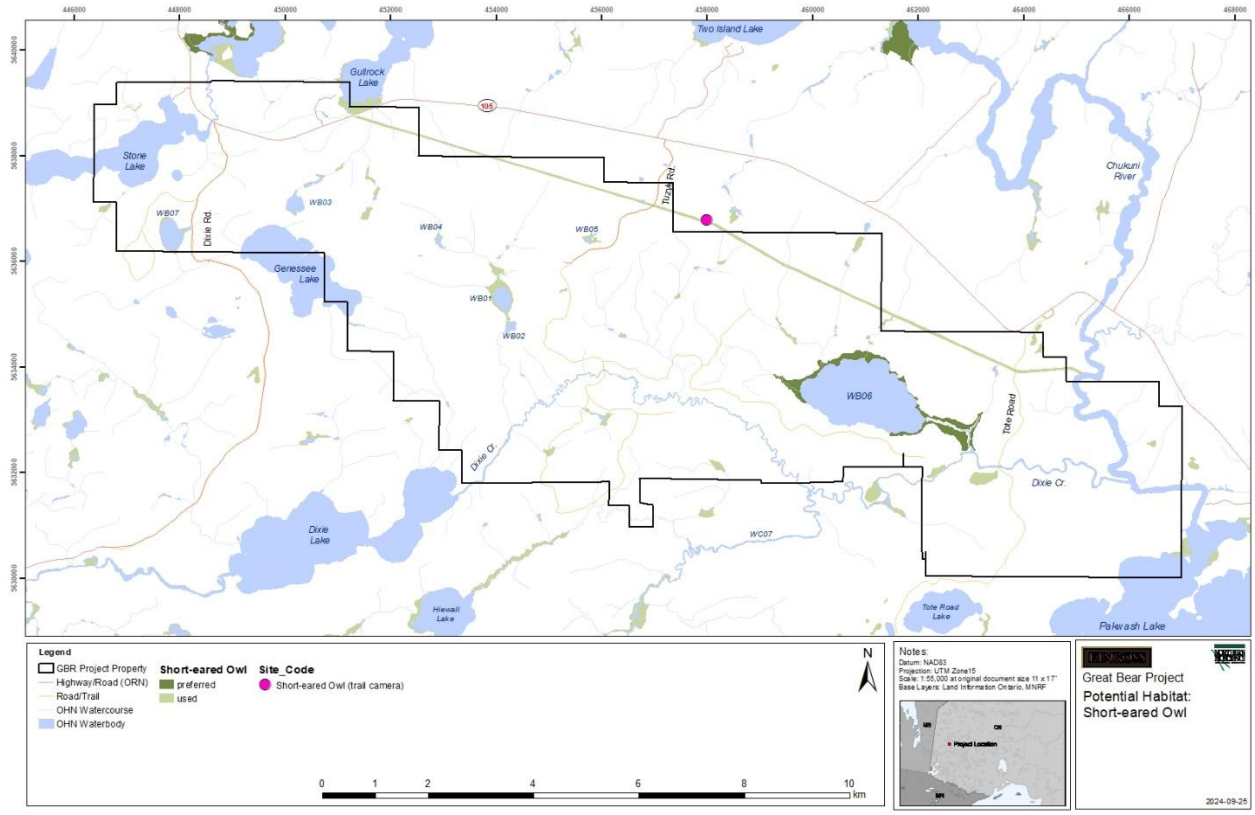


Figure 99. Location of short-eared owls observed at the GBR property and modelled potential habitat.

9.3.10 Yellow Rail

A yellow rail was heard during an evening survey at the small wetland at the boat launch on the west end of Genesee Lake on June 9, 2022. A subsequent survey the following night and deployment of an ARU did not detect its continued presence. It may have been a straggling migrant as there was no evidence of breeding. There is potential breeding habitat in the wetlands along Rice Lake shoreline, however they were too flooded to be suitable during the breeding season in 2022. Additional surveys were conducted at these locations for this nocturnal marsh bird in 2023 but were unsuccessful.

See Figure 105 and Appendix 53 for habitat modeling for yellow rail. Modeling suggests that there may be 155 ha of potentially suitable breeding or staging habitat for yellow rail on the GBR property, including 79 ha preferred and 86 ha used. Large contiguous areas of potentially suitable wetland habitat is generally lacking on the property and although the Project landscape may provide potentially suitable breeding or staging habitat for this species, it may be used only sporadically given the Project's location outside this species' main breeding range in Ontario.

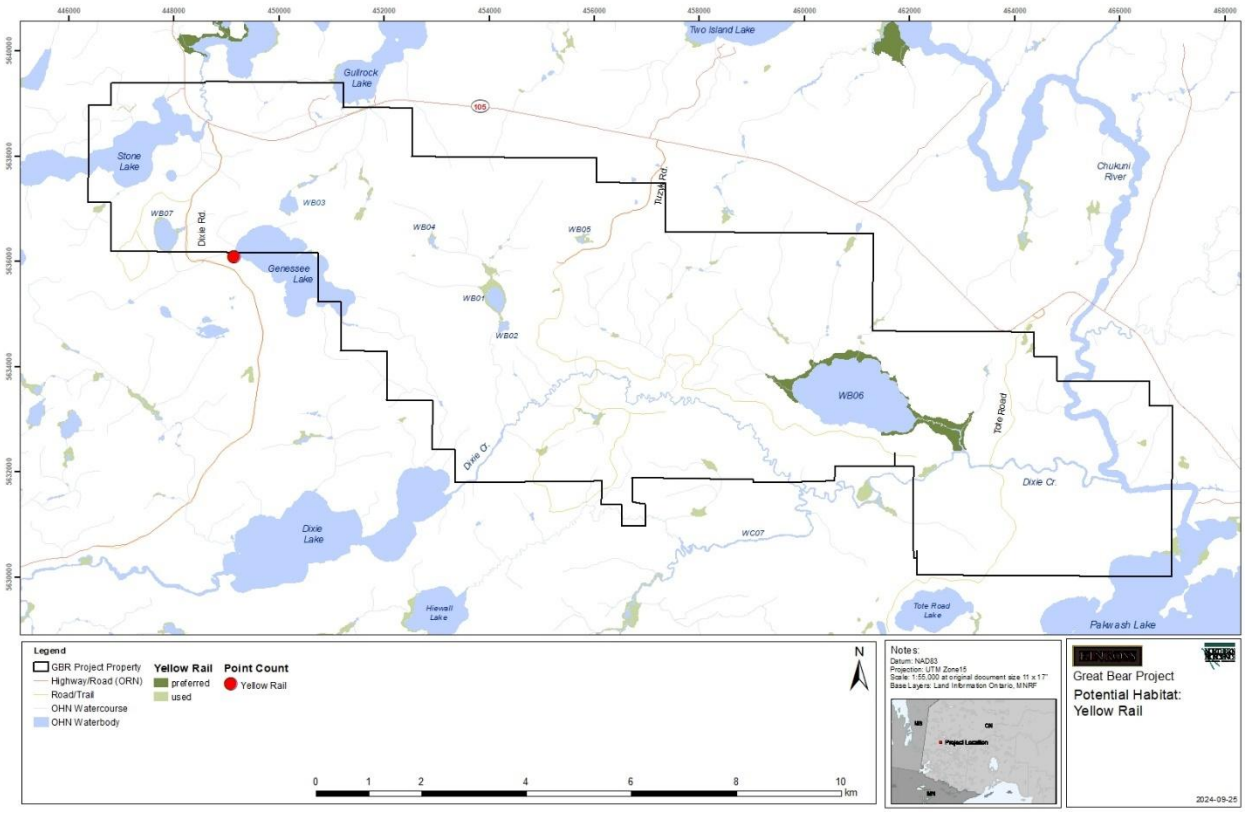


Figure 100. Location of yellow rails observed at the GBR property and modelled potential habitat.

9.3.11 American White Pelican

American white pelicans were observed on July 5, 2022, flying over Highway 105 at the south end of Bruce Lake while undertaking morning point counts. One was a singleton and the other was a flock of four individuals. No use of the Great Bear Property was observed in 2022 and could potentially be used for foraging, as could other waterbodies in the AOI, as well as Dixie Creek and the Chukuni River. There is no suitable nesting habitat i.e., remote islands on large lakes (AWPRT 2011) on the Great Bear property, however.

9.4 Reptile and Amphibian SAR

9.4.1 Common Snapping Turtle

Although common snapping turtles are known from the Red Lake area (iNaturalist 2022; ORRA 2024). A snapping turtle was observed along the banks of Dixie Creek by Kinross field technicians in 2022 and there is an unconfirmed report from an early exploration drill crew of one on a trail. No snapping turtles were observed in the Great Bear Project AOI in 2022-2023 by Northern Bioscience or fisheries field crews, suggesting that they are not common. Snapping turtles can tolerate a broad range of aquatic habitats, but their preferred habitat is shallow lakes or slow-moving water with a soft mud bottom and dense aquatic vegetation (COSEWIC 2008b; Environment Canada 2016a; Harding 2006). In the Project AOI, potentially suitable habitat is found along Dixie Creek and/or Rice Lake or other large watercourses or waterbodies.

9.5 Insect SAR

The only two SAR insects whose broad ranges overlap the Great Bear Project AOI are: yellow-banded bumblebee and monarch.

9.5.1 Yellow-banded Bumblebee

The presence of yellow-banded bumblebee (Figure 106) on the GBR property was confirmed by the observation of at least two individuals foraging for nectar roadside near Teardrop Lake (WB01) on August 19, 2023. Although listed as Special Concern due to apparent declines in abundance in parts of its range (COSEWIC 2015), recent targeted bumblebees surveys in northwestern Ontario (Harris et al. 2019), have indicated that the species is not uncommon along roadsides in much of northwestern Ontario. Across its Canadian range, yellow-banded bumble bees occur in a diverse range of habitats, including boreal forest and open habitats. It forages on a broad range of flowers for pollen and nectar from a variety of plant genera (COSEWIC 2015), which in northern Ontario includes Joe-pye weed (*Eutrochium maculatum*), fireweed (*Chamaenerion angustifolium*), and goldenrods (*Solidago* spp.) among others (Harris et al. 2019; Foster pers. obs). Like many bumble bees, it usually nests underground in pre-existing cavities such as abandoned rodent burrows and rotten logs. Solitary queens overwinter underground and in decomposing organic material such as rotting logs (COSWEIC 2015).

Figure 101. Yellow-banded bumblebee caught and live-released near Teardrop Lake, August 2023.

9.5.2 Monarch

Despite 2022-2023 surveys in apparently suitable habitat, no adult monarchs were observed nor was any milkweed (*Asclepias* spp.). Native milkweeds (*A. incarnata, A. ovalifolia*) are rare in much of northwestern Ontario, and unknown from the Red Lake area (e.g., iNaturalist 2024). Any common milkweed (*Asclepias syriaca*) in the Red Lake area is likely of anthropogenic origin and none was observed in the AOI. Milkweed patches with >9 individuals can be considered SWH. Red Lake is beyond the documented breeding range for this species in Ontario (COSEWIC 2016b).

10 SPECIES OF INDIGENOUS INTEREST

Kinross understands the importance of plants, fungi, and wildlife to Indigenous communities through ongoing information sharing. Project-specific Indigenous Traditional Knowledge (ITK) studies will be considered in Project planning and operation. Georeferenced observations and reference photos are taken where practical during fieldwork. Annotated lists of vascular plants, fungi, and wildlife are being compiled to help support studies on country food and fungi, plants, and animals of potential interest for country food, medicine, or spiritual/cultural value (e.g., Figure 107, Figure 108).

Figure 102. Mushroom (left) and wild rice and associated waterfowl (right) may be important to local harvesters and Indigenous communities.

Figure 103. Spruce grouse (left) and moose (right) may be wildlife species of interest to Indigenous communities that are found at the Project.

11 SUMMARY AND CONCLUSIONS

Background information review and 2021-2022 fieldwork have provided an initial assessment of baseline conditions at the Great Bear Project AOI. Preliminary findings of note include:

- Vegetation in the AOI is typically boreal and dominated by upland conifer and deciduous forest and lowland conifer forest and reflect relatively recent disturbance by wildfire and ongoing forest harvesting.
- Teardrop and Rice lakes harbour potentially significant wetlands, including wild rice marshes that are of significant value to waterfowl.
- Endangered black ash is present near Rice Lake and several other locations, and provincially rare floating marsh marigold is found along at least several ditches and streams in the AOI.
- The Project AOI has formerly supported Threatened woodland caribou but has no evidence of current use.
- Wolverines use the AOI at least occasionally, but it is not known if individuals of this Threatened species are resident.
- Little brown myotis, and potentially other Endangered bat species (northern myotis, tri-colored bat) use the AOI, at least for foraging. No evidence of roosting or hibernacula has been found.
- Threatened eastern whip-poor-will use at least the northwest corner of the AOI but have not been detected elsewhere despite repeated surveys; acoustic analysis is ongoing to determine if use is more widespread.
- There are two active colonies of Threatened bank swallow in aggregate pits along Tuzyk's road.
- Special Concern (SC) bird species confirmed at the project site during breeding season include Canada warbler, common nighthawk, eastern wood-pewee, evening grosbeak, and olive-sided flycatcher, and rusty blackbird. Likely SC migrants include yellow rail and short-eared owl.
- Other significant wildlife habitat in the AOI includes a Bonaparte's gull nesting colony on a small waterbody west of Dixie Road N, several raptor nests, and a sharp-tailed grouse lek.

12 LIST OF ACRONYMS & ABBREVIATIONS

AOI	Area of Interest
°C	degrees Celsius (temperature)
CCP	Caribou Conservation Plan
CEZ	Cervid Ecological Zone
DBH	Diameter Breast Height
EC	Environment Canada (pre-2017; now ECCC)
ECCC	Environment and Climate Change Canada (formerly EC pre-201)
ELC	Ecological Land Classification
END	Endangered
ESA	Endangered Species Act (provincial)
EWPW	eastern whip-poor-will
FMP	forest management plan
FRI	forest resource inventory
GBR	Great Bear Resources
GHD	General Habitat Description (for END and THR spp.)
ha	hectares (10,000 m^2)
km	kilometres
m	metres
MCP	Minimum Convex Polygon
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OHN	Ontario Hydrological Network
OMM	Ontario Ministry of Mines (formerly OMNDM)
OMNDM	Ontario Ministry of Northern Development and Mines (now OMM)
OMECP	Ontario Ministry of Environment Conservation and Parks
OMNR	Ontario Ministry of Natural Resources (pre-2017)
OMNRF	Ontario Ministry of Natural Resources and Forestry (post-2017)
PIF	Partners in Flight
SAR	Species at Risk (i.e., SC, THR, or END species)
SARA	Species at Risk Act (federal)
SC	Special Concern
sp./spp.	species (singular/plural)
SWH	Significant Wildlife Habitat

THR	Threatened
WCS	Wildlife Conservation Society
WMU	Wildlife Management Unit

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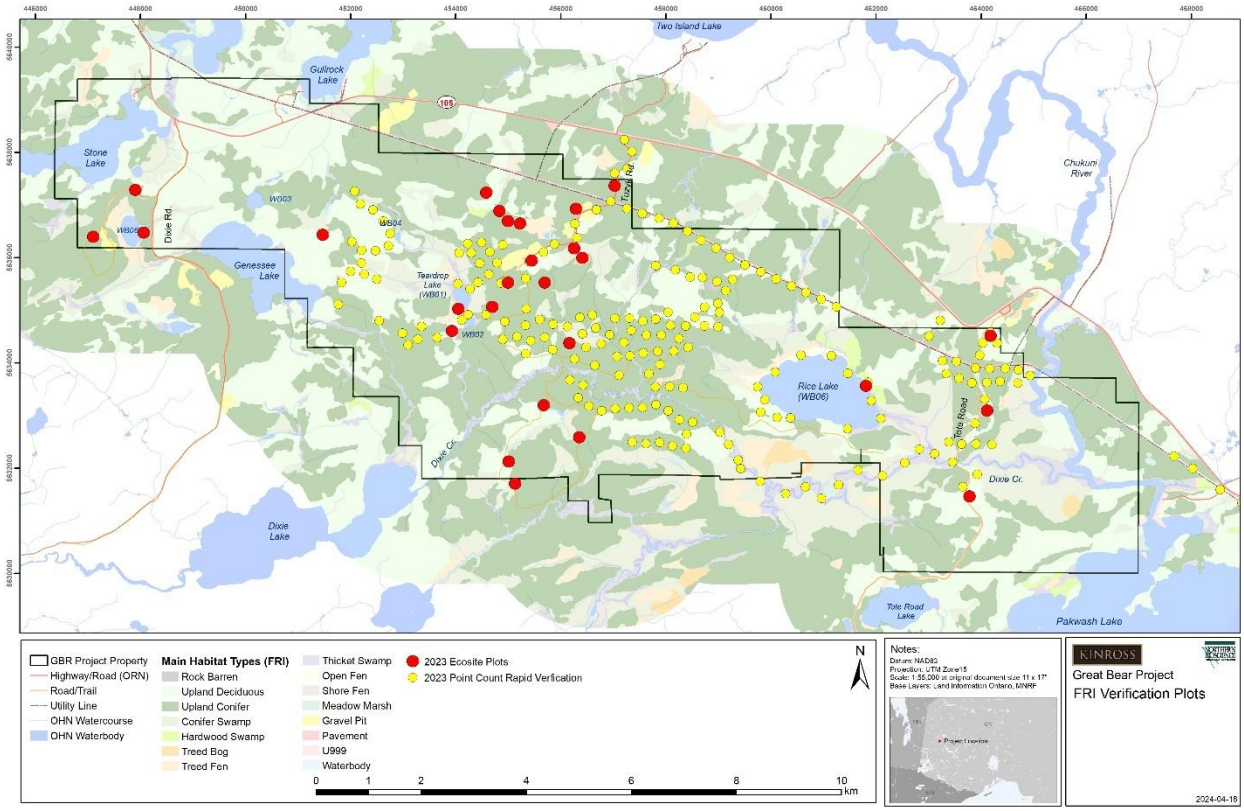
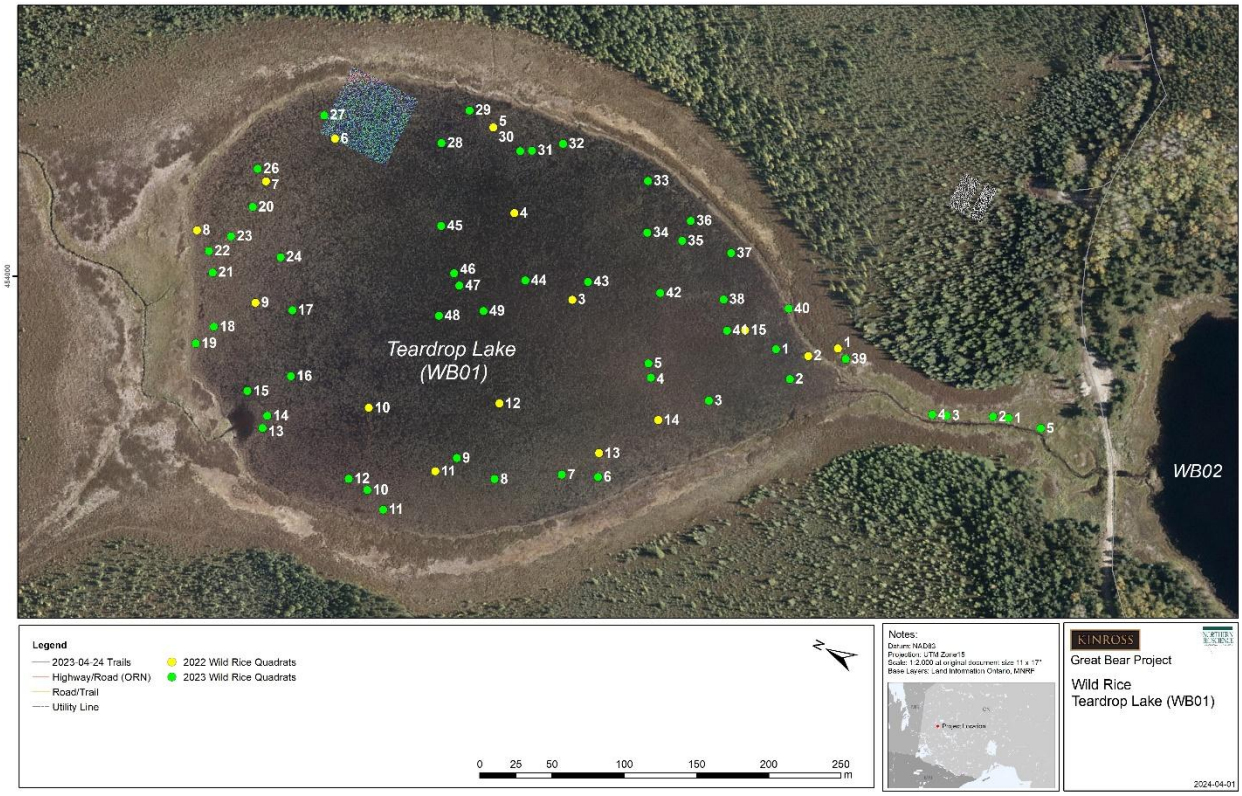
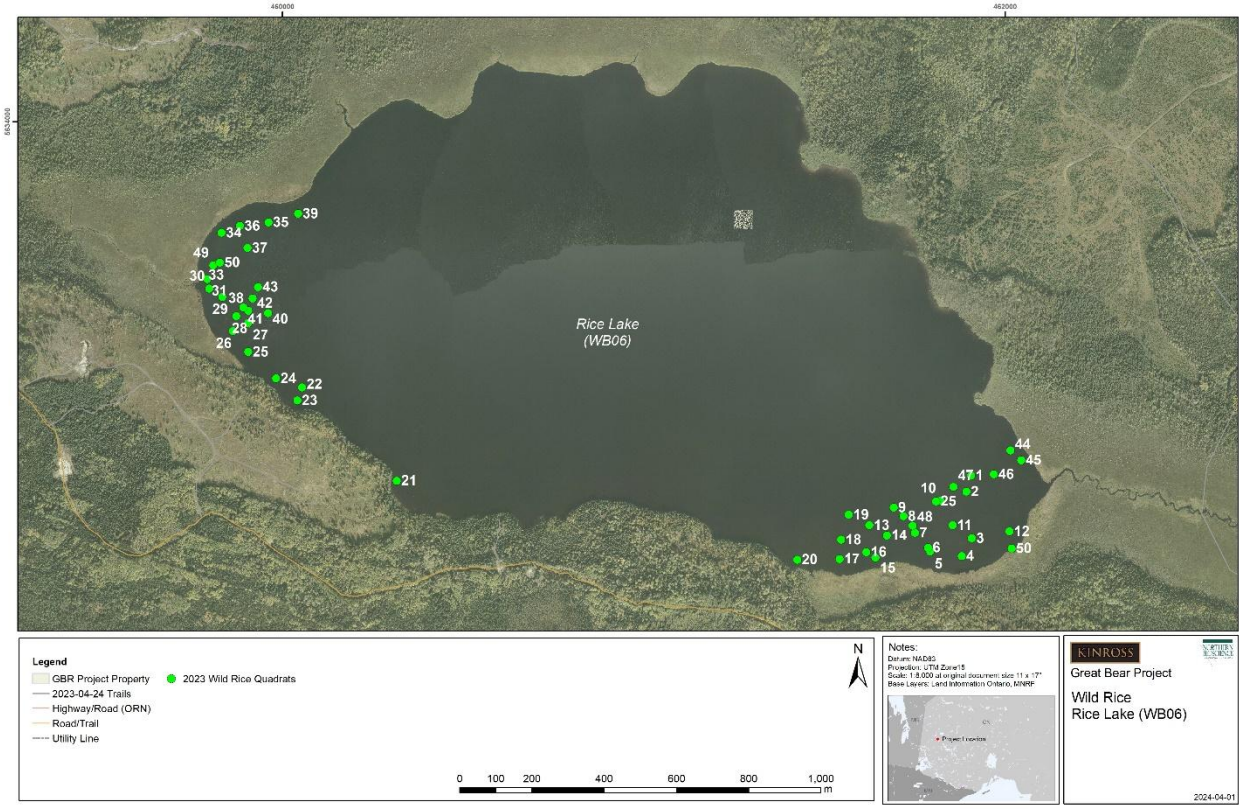
Appendix 1. Location of ecosite field verification plots in 2023.



Appendix 2. Location of 2022-2023 quadrats used to sample wild rice in Teardrop Lake (WB01) and Rice Lake (WB06).





Appendix 3. Details of trail camera deployments in November 21-December 2024*.

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
Browning #001	1a	Tuzyk E ROW	457995	5636785	0	2021-10-14	initial deployment		
					1	2021-11-22	replaced SD card	39	2,217
Browning #001	1b	Tuzyk E ROW	457980	5636751	2	2021-11-26	moved to south side of ROW	4	
					3	2022-02-12	cleared snow		
Browning #001	1b	Tuzyk E ROW	457980	5636751	4	2022-05-22	replaced SD card	177	2,218
					5	2022-08-22	replaced SD card	28	5,213
			457980	5636748	6	2023-05-15	replaced SD card?	259	5,525
Browning #001	1c	Tuzyk E ROW	458180	5636727	7	2023-06-06	replaced SD and removed	22	2,045
Browning #001	1d	Tuzyk E ROW	458178	5636721	8	2023-06-08	redeployed new location		
					9	2023-09-27	replaced SD card and repositioned	111	3,796
					10	2024-10-09	replaced SD card	253	606
Browning #002	2a	Dixie Loop Road	454970	5632432	0	2021-10-13	initial deployment		
					1	2021-11-24	replaced SD card	42	370
					2	2022-02-12	replaced SD card	78	496
					3	2022-05-09	replaced SD card and batteries		
					4	2022-07-01	replaced SD card and batteries	53	1,237
					5	2022-08-24	removed from field	54	8,018
Browning #002	2b	wolverine talus pile	451534	5636485	6	2022-09-22	redeployed here		
Browning #002	2c	trail west of WB04	451960	5635697	7	2023-05-17	removed and redeployed here	237	7,486
					8	2023-09-26	replaced SD card	71	4,167
Browning #003	3a	WB01 (Teardrop L)	454227	5635016	0	2021-10-13	initial deployment		
					1	2021-11-23	replaced SD card	41	268
					2	2022-02-12	replaced SD card	81	233
					3	2022-04-06	replaced SD card and batteries	53	6,056
Browning #003	3b	WB01 (Teardrop L) exit	454218	5635007	4	2022-05-19	moved from treeline to edge of leatherleaf; replaced SD card	43	685
					5	2022-08-22	removed from field	72	10,314
Browning #003	3c	wolverine talus pile	451492	5636468	6	2022-09-22	redeployed here		
Browning #003	3d	near WB04	457271	5633967	7	2023-05-17	removed & redeployed here	237	4,478
Browning #003	3e	near WB04	452867	5636323	8	2023-09-26	moved along beaver pond; replaced SD card	19	6,514
					9	2024-05-29	replaced SD card and batteries	49	594
					10	2024-10-09	replaced SD card	379	
Browning #004	4a	Waterbody WB02 ridge trail	454146	5634674	0	2021-10-13	initial deployment		

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
					1	2021-11-23	replaced SD card	41	174
					2	2022-02-10	replaced SD card	79	263
					3	2022-04-07	replaced SD card and batteries	86	227
					4	2022-05-19	replaced SD card	42	313
					5	2022-08-23	replaced SD card	96	3,099
					6	2022-11-22	replaced SD card	91	473
					7	2023-05-16	removed trail camera	175	775
Browning #004	4b	east of Tote Road between Dixie Cr and ROW	464009	5633784	8	2023-06-07	replaced SD card and batteries; redeployed		
					9	2023-09-25	replaced SD card	110	352
					10	2024-05-23	replaced SD caard and batteries	241	1,780
Browning #005	5a	WB01 (Teardrop L) south trail	454106	5634771	0	2021-10-13	initial deployment		
					1	2021-11-23	replaced SD card	41	92
					2	2022-02-10	replaced SD card	79	109
					3	2022-04-07	replaced SD card and batteries	55	51
					4	2022-05-19	replaced SD card	42	65
					5	2022-08-23	replaced SD card	96	855
					6	2022-11-22	replaced SD card	91	773
					7	2023-05-16	removed trail camera	175	3,759
Browning #006	6a	E. Dixie trail	458071	5633089	0	2021-10-13	initial deployment		
					1	2021-11-24	replaced SD card	42	82
					2	2022-02-10	replaced SD card	78	148
					3	2022-07-01	removed trail camera - damaged by bear	96	363
Browning #007	7a	Dixie Bridge	456029	5633932	0	2021-10-13	initial deployment		
Browning #007	7b		456029	5633932	1	2021-11-25	replaced SD card	43	4,511
					2	2022-02-12	replaced SD card	79	342
Browning #007	7c		456037	5633948	3	2022-04-06	moved trail camera to NE side of bridge	53	58
					4	2022-04-07	replaced SD card and batteries	31	108
					5	2022-05-19	removed trail camera	42	1,397
Browning #007	7d	Rice L Rd game trail	457652	5633540	6	2022-05-21	redeployed trail camera	2	
					7	2022-08-23	removed trail camera - damaged by skidder or bear	5	827
Browning #011	11a	Trail W of Rice Lake N to ROW	459300	5635697	0	2022-06-28	initial deployment		
					1	2023-05-15	replaced SD card; repositioned?	321	6,219
Browning #014	14a	S of main Rice Lake road	459259	5633257	0	2022-05-21	initial deployment		

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
					2	2022-08-25	replaced SD card	96	2,274
					3	2022-11-21	replaced SD card	88	420
					4	2023-05-18	replaced SD card and batteries	160	4,527
Browning #014	14b	Dixie E trail	459252	5633259	5	2023-09-28	replaced SD card & moved slightly	133	4,422
Browning #021	21a	E of Tuzyk's Rd and N of ROW	457789	5637061	0	2022-04-05	initial deployment		
					1	2022-05-20	removed trail camera	45	19
Browning #021	21b	Tuzyk ROW West	456733	5637185	2	2022-05-20	redeployed trail camera at new site		
					3	2022-06-14	removed trail camera	25	21
Browning #021	21c	Run Pole 2	452573	5634675	4	2022-11-21	redeployment at new wolverine run pole		
					5	2023-05-17	removed camera	177	288
Browning #021	21d	trail west of WB04	452218	5636119	6	2023-05-17	replaced SD card & batteries and redeployed here		
					7	2023-09-26	replaced SD card	132	210
					8	2024-10-09	replaced SD card	379	417
Browning #022	22a	WB05 west of Tuzyk Road by gravel pits	455751	5636349	0	2022-04-05	initial deployment		
			455757	5636350	1	2022-05-07	replaced SD card		
					2	2022-05-20	replaced SD card	13	108
					3	2022-08-23	removed trail camera	81	7,242
Browning #022	22b	wolverine talus pile	451472	5636433	4	2022-09-22	redeployed		
Browning #022	22c	wolverine talus pile	452412	5634588	5	2023-05-17	replaced SD card and batteries; repositioned	237	1,969
					6	2023-09-26	pulled		1,202
Browning #023	23a	Rice L. trail junction #2	459819	5632913	0	2022-04-08	initial deployment		
Browning #023	23b	Rice L. trail junction #2	459790	5632923	1	2022-05-21	changed location slightly; replaced SD card and batteries	43	390
					2	2022-08-25	replaced SD card	96	3,368
					3	2022-11-21	replaced SD card	88	225
					4	2023-05-19	replaced SD card and batteries	179	177
Browning #023	23c	Dixie E2 trail	459792	5632923	5	2023-09-28	replaced SD card & respositioned 2 m	132	9,391
Browning #024	24a	E of Tote Road by Dixie Creek bridge	463715	5631971	0	2022-04-05	initial deployment		
					1	2022-05-09	replaced SD card and batteries	21	244
			463705	5631956	2	2022-05-19	replaced SD card	10	295
Browning #024	24b	N of Quonset Hut	455972		3	2022-11-22	checked & redeployed	53	4,082
				5634589	4	2023-06-04	replaced SD card	7733	
		on exploration trail north of Laydown #1	455970	5634593	5	2023-08-18	repositioned on same tree; did not swap SD card		
		on exploration trail north of Laydown #2	455975	5634589	6	2023-09-28	removed	116	24,958

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
Browning #025	25a	STGR Lek	462330	5633910	0	2022-04-05	initial deployment		
					1	2022-05-21	removed trail camera	46	157
Browning #025	25b	exploration road W of Tuzyk quarries	454697	5636038	2	2022-07-06	redeployed trail camera		
					3	2022-08-23	replaced SD card	48	578
					4	2023-05-15	stolen		
Browning #026	26a	ROW W of STGR lek	462254	5634686	0	2022-04-05	initial deployment		
			462252	5634683	1	2022-05-21	replaced SD card	46	6,574
					2	2022-07-06?	removed from field - damaged by bear	4	542
Browning #031	31a	trail SW of Tuzyk Rd gravel pits	454841	5636434	0	2022-05-23	initial deployment		
					1	2022-08-23	replaced SD card	92	714
					2	2023-05-15	stolen		
Browning #50	50a	on trail past Run Pole #1	458201	5633595	0	2023-05-18	initial deployment		
		Dixie trail			1	2023-09-27	replaced SD card	132	763
Browning #51	51a	trail west of Tuzyk Rd gravel pits	455241	5636784	0	2023-06-08	initial deployment		
		trail				2023-09-26	replaced SD card	110	5,796
Browning #54	54a	creek from Genessee L near Run Pole #2	452418	5634597	0	2023-05-18	initial deployment		
					1	2023-09-26	replaced SD card	131	2,705
Browning #59	59a	ROW east of Tote Road	464577	5633991	0	2023-06-07	initial deployment		
			464576	5633989	1	2023-09-25	stolen	110	
Browning #60	60a	trail west of WB04	452079	5637131	0	2023-06-06	initial deployment		
			452076	5637126	1	2023-09-26	redeployed and replaced SD card	112	3,427
					2	2024-10-09	replaced SD card	379	5,615
Browning 61	61a	trail junction east of Tuzyk Road	456921	5635345	0	2023-05-15	initial deployment		
Browning #62a	62a	trail SW of Tuzyk Rd gravel pits	454810	5636006	0	2023-05-15	initial deployment		
					1	2023-09-26	replaced SD card	134	645
					2	2024-10-19	replaced SD card	389	525
Browning #63a	63a	north trail east of Tuzyk Rd	457236	5636325	0	2023-05-15	initial deployment		
Browning #64	64a	between Dixie Creek and trail east of Harry's culvert	457563	5633469	0	2023-05-18	initial deployment		
		game trail	457563	5633469	1	2023-09-28	replaced SD card	133	3,000
Browning #65	65a	Rice Lake trail	462215	5634508	0	2023-06-08	initial deployment		
Browning #65	65b	Rice Lake trail	462217	5634468	1	2023-09-27	replaced SD card; repositioned	111	426
Browning #66	66a	side trail of trail NE from Harry's culvert	458426	5634888	0	2023-06-08	initial deployment		
Browning #66	66b	Rice Lake W	458417	5634885	1	2023-09-28	replaced SD card; repositioned	112	6,911

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
Browning #67	67a	AEX footprint	455234	5634580	0	2023-06-04	initial deployment		
Browning #67	67b	Dixie Creek rapids	458504	5633097	1	2023-07-09	removed from AEX and redeployed at Dixie Creek rapids	35	
Browning #67	67c	Dixie Creek rapids	458420	5633111	2	2023-09-28	replaced SD card and redeployed upstream	81	1,998
Browning #68	68a	beaver pond near Laydown #1	456417	5634550	0	2023-06-04	initial deployment		
Browning #69	69a	trail on E side of WB01 (Teardrop L)	454325	5635400	0	2023-06-05	initial deployment		
					1	2023-09-26	replaced SD card	113	3,600
					2	2024-05-24	replaced SD card & batteries	49	150
Browning #300	300a	trail SW of WB01 (Teardrop L)	453792	5633891	1	2022-06-06	initial deployment		
					2	2022-06-28	replaced SD card	22	2,838
					3	2022-08-23	replaced SD card	56	2,139
					4	2023-05-16	replaced SD card; repositioned	266	819
					5	2023-07-09	replaced SD card	54	4,347
Browning #301	301a	on trail on NW shore of WB03 (N of Genesee L.)	450161	5637309	0	2022-06-03	initial deployment		
	301a		450161	5637309	1	2022-06-29	replaced SD card	26	23
					2	2022-08-24	replaced SD card	56	52
					3	2023-05-18	removed	267	175
Browning #301	301b	WB05 west of Tuzyk Road by gravel pits	459375	5633011	4	2023-05-18	redeployed here	0	
Browning #301	301c	WB05 west of Tuzyk Road by gravel pits	455756	5636344	5	2023-09-26	redeployed and replaced SD card	131	21,060
					6	2024-06-12	replaced SD card	260	207
					7	2024-10-19	replaced SD card	129	509
Browning #303	303a	on SW shore of WB03 (N of Genesee L.)	449993	5636992	0	2022-06-04	initial deployment		
					1	2022-06-29	replaced SD card	25	729
					2	2022-08-24	replaced SD card	56	432
					3	2022-05-18	checked - stolen?		
Browning #501	501a	WB01 (Teardrop L) parking	454282	5634886	0	2022-11-22	initial deployment		
					1	2023-05-16	replaced SD card	175	20,562
					2	2023-09-26	replaced SD card	133	11,982
					3	2024-10-19	replaced SD card	389	8,732
Reconyx RP1	RP1-1a	Run Pole #1	457556	5633279	0	2021-11-25	initial deployment		
					1	2022-02-12	replaced SD card	79	
					2	2022-04-06	replaced SD card	53	
					3	2022-07-01	removed	11	25,647
Reconyx LVHS	RP1-2a	Run Pole #1	457556	5633279	0	2021-11-25	initial deployment		

Unit_No	Deployment	Location Name	Easting	Northing	Check/ Move #	Date YYYY-MM-DD	Action	# Days Operational	Total # Photos/ Videos
					1	2022-02-12	replaced SD card	79	2,934
					2	2022-04-06	replaced SD card	53	18,759
					3	2022-07-01	removed	86	2,569
Unlabelled Browning	RP1-3a	Run Pole #1	457556	5633279	0	2021-11-25	initial deployment		
					1	2022-02-12	replaced SD card	79	
					2	2022-04-06	replaced SD card	53	
					3	2022-07-01	replaced SD card and batteries	23	224
Browning AuTECO #5					4	2022-11-21	replaced bear-damaged unit	51	237
					5	2023-05-18	replaced SD card and batteries	178	28,908
					6	??	removed		
Gr Bear 05	RP1-5a	Run Pole #1	457556	5633279	0	2022-11-21	initial deployment		
					1	2022-05-18	removed from run pole		
Reconyx LVHS 1	RP2-1a	Run Pole #2	452573	5634675	1	2022-11-21	redeployed at new run pole	143	
					2	2023-05-17	replaced SD card and batteries	177	
			452574	5634675	3	2023-09-26	removed camera	132	

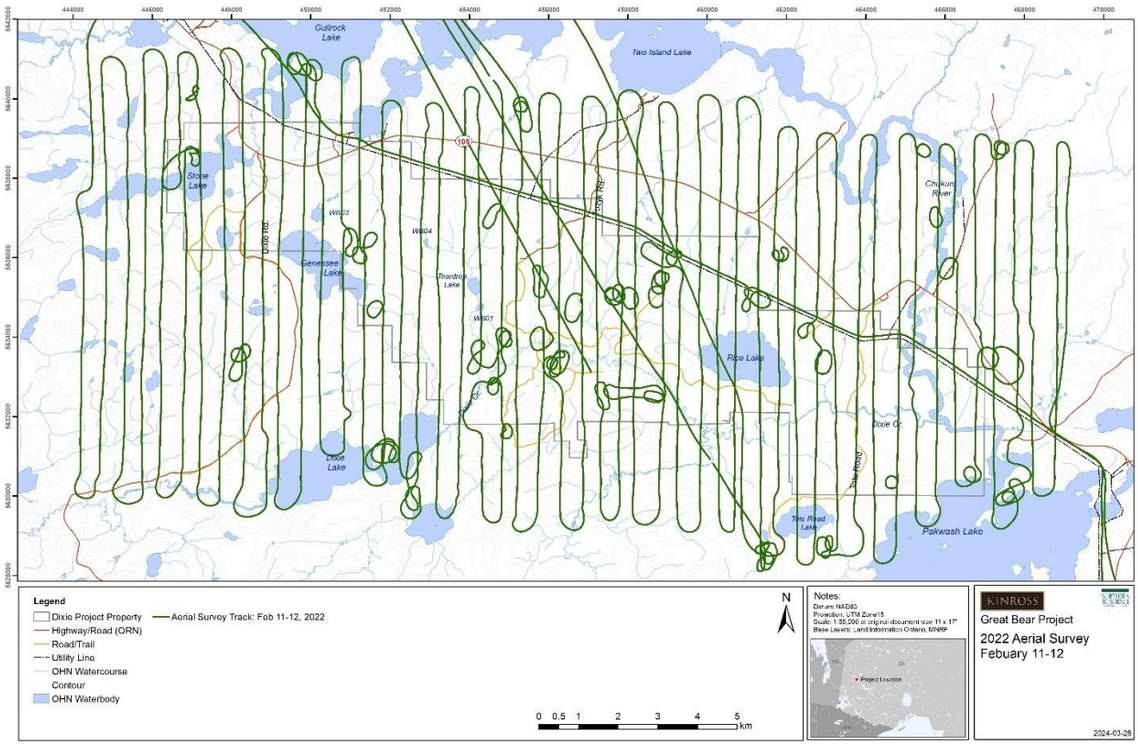
*UTM Zone 15; NAD83

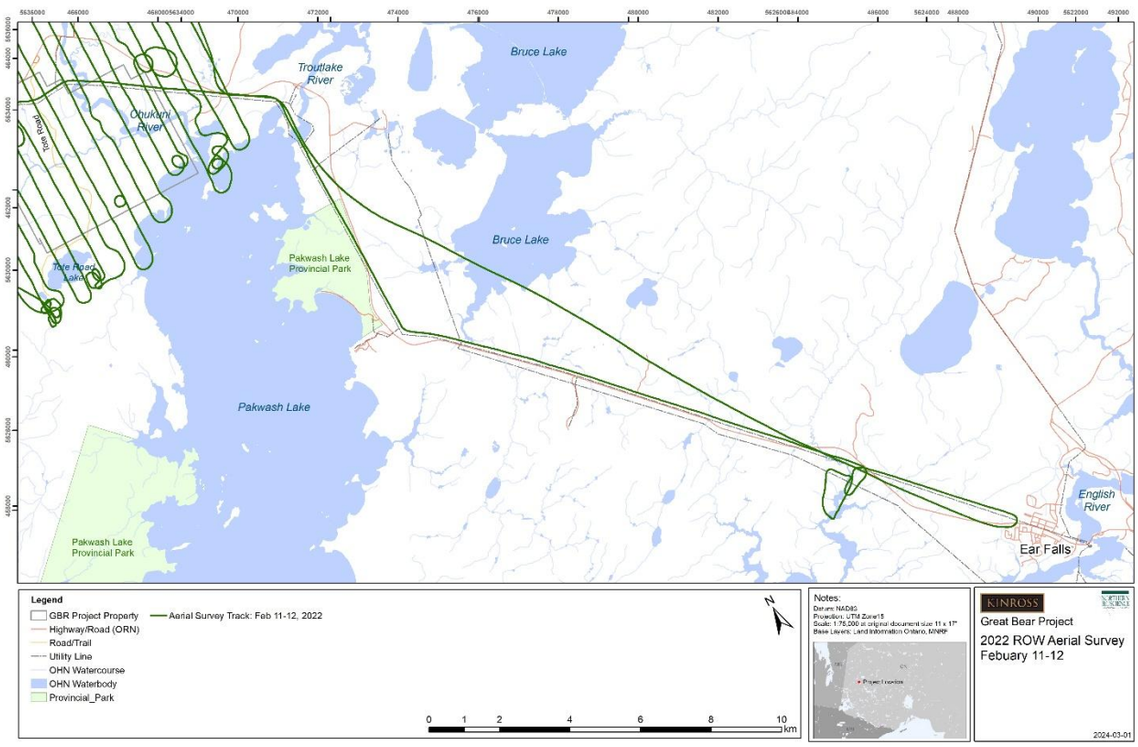
Appendix 4. Details of 2022-2023 winter aerial surveys for the GBR project

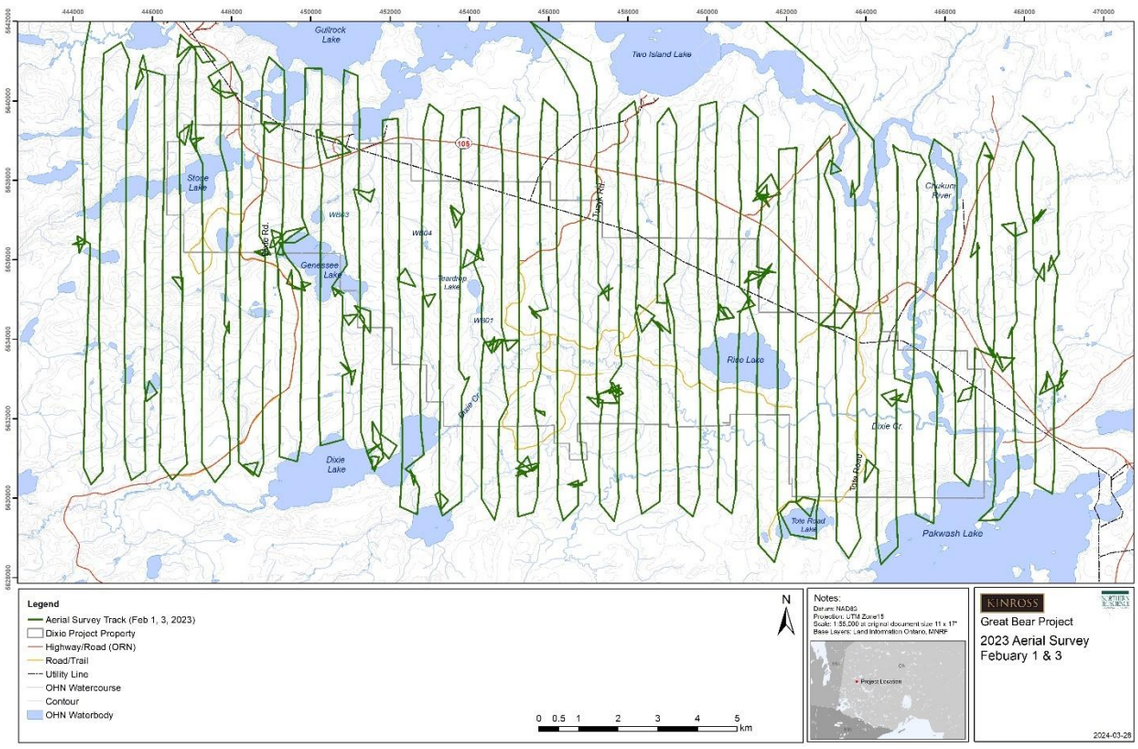
Survey Date	Survey Time (CST)[1]	Total Time (HH:MM) on Transect[1]	Observers	Scope	Mean Air Temperature (°C)	Wind (Beaufort Scale)	Cloud Cover (%)	Precipitation
Feb 11, 2022	9:52 – 13:06 14:01 - 15:56	5:09	R. Foster, B. Ratcliff I. Cooke	Target: Moose Aerial Inventory, caribou/wolverine, Area: Project lease area	-22 to -30	0	90%	0
Feb 12, 2022	10:57 – 13:35	2:32	R. Foster, B. Ratcliff J. McFee	Target: Moose Aerial Inventory, caribou/wolverine, Area: Project lease area & possible transmission line corridor	-18 to -24	4	0%	0
Feb 1, 2023	9:32 – 13:11 14:00 – 15:55	5:34	B. Ratcliff G. Racey T. Armstrong	Target: Moose Aerial Inventory, caribou/wolverine, Area: Project lease area	-18 to -32	0-1	40% very high, thin	0
Feb 3, 2023	10:08 – 11:21	1:13	B. Ratcliff G. Racey T. Armstrong	Target: Moose Aerial Inventory, caribou/wolverine, Area: Project lease area	-28 to -23	1	0%	0
April 10, 2023	14:20 - 15:15	0:55	R. Foster, B. Ratcliff T. Armstrong	Target: possible wolverine den; stick nests Area: higher potential locations	-15 to -10	2	20%	0

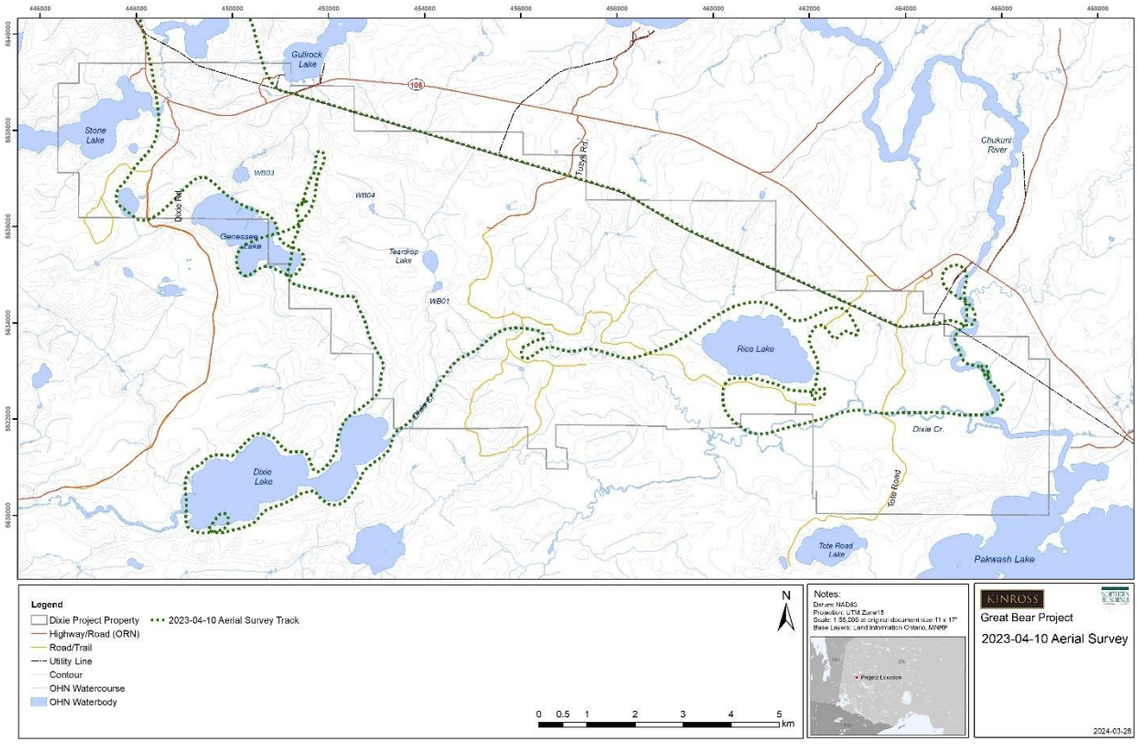
[1] not including ferry/refueling.

Appendix 5. 2022-2023 winter aerial survey flight tracks for the GBR project.






Gullrock Lake
Two Island Lake
Stone Lake
105
WB03
WB04
Dixie Rd
Genesee Lake
Teardrop Lake
WB01
Dixie Cr.
Dixie Lake
Tidy Rd
Chukuni River
Rice Lake
Dixie Cr.
Tote Road Lake
Pakwash Lake
Legend
Aerial Survey Track (Feb 1, 3, 2023)
Dixie Project Property
Highway/Road (ORN)
Road/Trail
Utility Line
OHN Watercourse
Contour
OHN Waterbody
0 0.5 1 2 3 4 5 km
N
Notes:
Datum: NAD83
Projection: UTM Zone15
Scale: 1:35,000 at original document size 11 x 17"
Base Layers: Land Information Ontario, MNRF
Project Location
KINROSS
Great Bear Project
2023 Aerial Survey
Febuary 1 & 3
2024-03-28


Gullrock Lake
Stone Lake
105
WB03
WB04
Dixie Rd
Genesee Lake
Teardrop Lake
WB01
Dixie Cr.
Dixie Lake
Tidy Rd
Chukuni River
Rice Lake
Dixie Cr.
Tote Road
Tote Road Lake
Pakwash Lake
Legend
Dixie Project Property
2023-04-10 Aerial Survey Track
Highway/Road (ORN)
Road/Trail
Utility Line
Contour
OHN Watercourse
OHN Waterbody
0 0.5 1 2 3 4 5 km
N
Notes:
Datum: NAD83
Projection: UTM Zone15
Scale: 1:35,000 at original document size 11 x 17"
Base Layers: Land Information Ontario, MNRF
Project Location
KINROSS
Great Bear Project
2023-04-10 Aerial Survey
2024-03-28

Appendix 6. Summary of nocturnal and crepuscular surveys for bats, anurans, and birds in the GBR Project Area of Interest, 2022-2023.

Target Taxa	Dixie Creek	Dixie Road N	Geneseee Lake	Hwy 105	Dixie Loop Road	Rice Lake (WB06)	Teardrop Lake (WB01)	Tote Road	Tuzyk's Road	WB02	Grand Total
owls		**2**		**2**	**3**			**6**	**5**		**18**
2022-04-04		2		2				6	5		15
2022-04-05					3						3
owls, woodcock, anurans		**7**		**7**	**7**			**9**	**8**	**1**	**39**
2022-05-06					7				8	1	16
2022-05-07				3				9			12
2022-05-08		7		4							11
bats, nightjars, anurans		**33**	**1**	**9**	**36**		**1**	**81**	**75**	**1**	**237**
2022-05-19									14		14
2022-05-22		3						13			16
2022-06-07					7						7
2022-06-08				3	4			10			17
2022-06-09		7			8			7			22
2022-06-10		4		6	12				2	1	25
2022-06-11		4						9			13
2022-06-12								8			8
2022-07-02		11	1		5				11		28
2022-07-03								17	3		20
2023-06-03									16		16
2023-06-10		4							15		19
2023-07-05							1	17	14		32
marsh birds & anurans (MMP)			**1**			**4**	**4**			**1**	**10**
2022-06-10							2				2
2022-06-11						4					4
2022-07-05			1				2			1	4
marsh birds (MMP)	**1**				**1**	**13**	**1**				**16**
2022-06-08	1				1						2
2023-06-01						1					1
2023-06-10							1				1
2023-06-11						5					5
2023-07-08						7					7
Grand Total	**1**	**42**	**2**	**18**	**47**	**17**	**6**	**96**	**88**	**3**	**320**

Appendix 7. Details of 2022-2023 in-person nocturnal surveys for bats, birds, and amphibians in the GBR Project AOI.

Date	Location	Easting	Northing	Station #	Time Start	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-05-19	Tuzyk's Road	457187	5638271	1	21:34	9.9	0	100	0	1
2022-05-19	Tuzyk's Road	457268	5637764	2	21:40					
2022-05-19	Tuzyk's Road	457070	5637349	3	21:46					
2022-05-19	Tuzyk's Road	456814	5636984	4	21:51					
2022-05-19	Tuzyk's Road	456352	5636808	5	21:55					
2022-05-19	Tuzyk's Road	456198	5636306	6	22:00					
2022-05-19	Tuzyk's Road	455715	5636201	7	22:04					
2022-05-19	Tuzyk's Road	455303	5635899	8	22:05					
2022-05-19	Tuzyk's Road	455373	5635496	9	22:14					
2022-05-19	Tuzyk's Road	455325	5635016	10	22:18					
2022-05-19	Tuzyk's Road	454938	5634756	11	22:22					
2022-05-19	Tuzyk's Road	455063	5634311	12	22:28					
2022-05-19	Tuzyk's Road	455497	5634098	13	22:33					
2022-05-19	Tuzyk's Road	456012	5634112	14	22:38	10.0	0	100	0	1
2022-05-22	Tote Road	462244	5629888	1	21:35	8.8	1	30	0	2
2022-05-22	Tote Road	462757	5629927	2	21:48	9.0	1	20	0	1
2022-05-22	Tote Road	463309	5629895	3	21:56	10.1	1	10	0	1
2022-05-22	Tote Road	463648	5630332	4	22:04	9.4	1	5	0	1
2022-05-22	Tote Road	463981	5630834	5	22:11	8.8	1	0	0	1
2022-05-22	Tote Road	463784	5631301	6	22:18	7.0	1	0	0	1
2022-05-22	Tote Road	463778	5631852	7	22:25	6.1	1	0	0	1
2022-05-22	Tote Road	463561	5632328	8	22:33	6.0	1	0	0	1
2022-05-22	Tote Road	463864	5632765	9	22:41	8.0	1	0	0	1
2022-05-22	Tote Road	463928	5633269	10	22:48	7.9	1	0	0	1
2022-05-22	Tote Road	463811	5633810	11	22:55	8.5	1	0	0	1
2022-05-22	Tote Road	464021	5634510	12	23:02	7.9	1	0	0	1
2022-05-22	Tote Road	464412	5634908	13	23:09	7.2	1	0	0	1
2022-05-22	Dixie Road N	448225	5636154	14	23:35	9.5	1	0	0	2
2022-05-22	Dixie Road N	448234	5636719	15	23:42	8.4	1	0	0	1
2022-05-22	Dixie Road N	448324	5637197	16	23:50	4.4	1	0	0	1
2022-06-07	Loop Road	456410	5632041	1	21:58	12.4	1	10	0	0
2022-06-07	Loop Road	456633	5632917	2	22:09	12.3	1	10	0	0
2022-06-07	Loop Road	455903	5633275	3	22:21	11.0	0	10	0	0
2022-06-07	Loop Road	456024	5634043	4	22:30	10.1	0	0	0	0
2022-06-07	Loop Road	455141	5634266	5	22:38	10.1	0	0	0	0
2022-06-07	Loop Road	455266	5634924	6	33:46	10.6	0	0	0	0
2022-06-07	Loop Road	455207	5635820	7	22:53	10.6	0	0	0	0
2022-06-08	Tote Road	461592	5629297	1	21:59	11.5	0	30	0	0
2022-06-08	Tote Road	461898	5629784	2	22:05	10.8	0	20	0	0
2022-06-08	Tote Road	462303	5629880	3	22:12	8.7	0	20	0	0
2022-06-08	Tote Road	462764	5629921	4	22:18	10.0	0	10	0	0
2022-06-08	Tote Road	463268	5629896	5	22:25	10.3	0	10	0	0
2022-06-08	Tote Road	463584	5630218	6	22:31	7.6	0	10	0	0
2022-06-08	Tote Road	463874	5630646	7	22:37	9.1	0	0	0	0
2022-06-08	Tote Road	463961	5631117	8	22:44	8.1	0	0	0	0
2022-06-08	Loop Road	456064	5636255	8	23:01	9.7	0	0	0	0
2022-06-08	Tote Road	463735	5631525	9	22:50	9.3	0	0	0	0
2022-06-08	Loop Road	456676	5636940	9	23:08	9.4	0	0	0	0
2022-06-08	Tote Road	463673	5631984	10	22:56	8.2	0	0	0	0
2022-06-08	Loop Road	457191	5637712	10	23:17	9.0	0	0	0	0
2022-06-08	Loop Road	457195	5638304	11	23:24	8.6	2	0	0	0
2022-06-08	Hwy 105	455952	5638520	12	23:31	7.6	1	0	0	1
2022-06-08	Hwy 105	453074	5638993	13	23:42	9.8	1	0	0	1
2022-06-08	Hwy 105	451819	5638988	14	23:49	5.8	1	0	0	1
2022-06-09	Loop Road	456409	5632048	1	22:06	11.6	2	30	0	0
2022-06-09	Loop Road	456382	5632520	2	22:13	11.6	1	30	0	1
2022-06-09	Loop Road	456633	5632914	3	22:20	11.7	1	10	0	0
2022-06-09	Loop Road	456377	5633220	4	22:27	9.2	1	10	0	1
2022-06-09	Loop Road	455910	5633287	5	22:34	10.9	0	0	0	0
2022-06-09	Loop Road	455762	5633646	6	22:41	10.9	0	0	0	0
2022-06-09	Loop Road	456030	5634002	7	22:48	8.5	0	0	0	0
2022-06-09	Loop Road	455628	5634134	8	22:55	9.1	0	0	0	0
2022-06-09	Tote Road	463586	5632378	11	23:02	8.9	0	0	0	0
2022-06-09	Tote Road	463883	5632787	12	22:08	9.5	0	0	0	0
2022-06-09	Tote Road	463929	5633255	13	23:19	9.3	0	0	0	0
2022-06-09	Tote Road	463809	5633756	14	23:25	8.2	0	0	0	0
2022-06-09	Tote Road	463834	5633931	15	23:31	8.5	1	0	0	0
2022-06-09	Tote Road	464023	5634392	16	23:38	8.8	0	0	0	0
2022-06-09	Tote Road	464269	5634832	17	23:44	8.0	1	0	0	0
2022-06-09	Dixie Road N	448640	5638573	18	00:05	7.5	0	0	0	0

Date	Location	Easting	Northing	Station #	Time Start	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-06-09	Dixie Road N	448815	5638093	19	00:15	6.7	0	0	0	0
2022-06-09	Dixie Road N	448745	5637637	20	00:22	6.5	0	0	0	0
2022-06-09	Dixie Road N	448367	5637299	21	00:29	6.9	0	0	0	0
2022-06-09	Dixie Road N	448232	5636820	22	00:35	5.7	0	0	0	0
2022-06-09	Dixie Road N	448207	5636306	23	00:41	6.9	0	0	0	0
2022-06-09	Dixie Road N	448493	5636031	24	00:48	5.8	0	0	0	0
2022-06-10	WB01	454288	5634899	1	22:00	12.7	0	0	0	0
2022-06-10	Tuzyk's Road	454756	5635131	2	22:07	14.6	1	0	0	1
2022-06-10	Tuzyk's Road	455065	5635524	3	22:14	14.7	0	0	0	1
2022-06-10	Dixie Road N	448480	5636039	4	22:42	10.8	0	0	0	0
2022-06-10	Dixie Road N	448223	5636362	5	22:50	12.1	0	30	0	0
2022-06-10	Dixie Road N	448256	5636918	6	22:56	11.4	0	30	0	0
2022-06-10	Loop Road	455146	5634270	9	23:01	9.7	0	0	0	0
2022-06-10	Loop Road	454939	5634629	10	23:08	10.1	0	0	0	0
2022-06-10	Loop Road	455264	5634918	11	23:14	10.5	0	0	0	0
2022-06-10	Loop Road	455371	5635515	12	23:21	10.6	0	0	0	0
2022-06-10	Loop Road	455219	5635833	13	23:27	10.7	2	0	0	0
2022-06-10	Loop Road	455628	5636131	14	23:35	11.2	1	0	0	0
2022-06-10	Loop Road	456098	5636258	15	23:42	10.2	0	0	0	0
2022-06-10	Loop Road	456316	5636674	16	23:47	10.3	1	0	0	0
2022-06-10	Loop Road	456678	5636938	17	23:53	9.1	1	0	0	0
2022-06-10	Loop Road	456984	5637068	18	23:59	8.1	2	0	0	0
2022-06-10	Loop Road	457184	5637695	19	00:06	9.2	1	0	0	0
2022-06-10	Loop Road	457175	5638219	20	00:13	8.7	1	0	0	0
2022-06-10	Hwy 105	455960	5638516	21	00:20	6.9	1	0	0	1
2022-06-10	Hwy 105	454649	5638806	22	00:28	10.1	1	0	0	0
2022-06-10	Hwy 105	453217	5638982	23	00:37	9.1	1	0	0	0
2022-06-10	Hwy 105	451817	5638988	24	00:45	8.2	1	0	0	0
2022-06-10	Hwy 105	450564	5638523	25	00:52	7.1	1	0	0	0
2022-06-10	Dixie Road N	448646	5638629	26	00:59	6.6	1	0	0	0
2022-06-10	Hwy 105	448177	5639290	27	01:08	6.3	1	0	0	0
2022-06-11	Dixie Road N	448425	5637349	7	23:03	10.8	0	20	0	0
2022-06-11	Dixie Road N	448766	5637657	8	23:09	10.4	0	30	0	0
2022-06-11	Dixie Road N	448806	5638123	9	23:18	9.2	0	20	0	0
2022-06-11	Dixie Road N	448649	5638599	10	23:25	10.5	0	20	0	0
2022-06-11	Tote Road	463518	5632082	11	22:01	12.5	0	0	0	0
2022-06-11	Tote Road	461869	5629759	12	22:09	15.2	0	0	0	0
2022-06-11	Tote Road	462293	5629881	13	22:16	9.9	0	0	0	0
2022-06-11	Tote Road	462748	5629926	14	22:22	11.0	0	0	0	0
2022-06-11	Tote Road	463251	5629907	15	22:30	12.0	0	0	0	0
2022-06-11	Tote Road	463587	5630220	16	22:37	7.6	0	0	0	0
2022-06-11	Tote Road	463875	5630649	17	22:44	9.7	0	0	0	0
2022-06-11	Tote Road	463975	5631099	18	22:50	8.7	0	0	0	0
2022-06-11	Tote Road	463737	5631523	19	22:56	9.5	0	0	0	0
2022-06-12	Tote Road	463664	5631993	20	23:03	10.0	0	20	0	0
2022-06-12	Tote Road	463589	5632381	21	23:10	10.8	0	20	0	0
2022-06-12	Tote Road	463875	5632778	22	23:17	11.0	0	20	0	0
2022-06-12	Tote Road	463928	5633237	23	23:23	11.4	0	20	0	0
2022-06-12	Tote Road	463809	5633738	24	23:30	10.6	0	20	0	0
2022-06-12	Tote Road	463838	5633932	25	23:36	12.0	2	50	0	0
2022-06-12	Tote Road	464021	5634378	26	23:42	10.8	2	50	0	0
2022-06-12	Tote Road	464247	5634811	27	23:48	8.9	0	50	0	0
2022-07-02	Dixie Road N	448531	5636040	1	22:05	8.5	0	15	0	0
2022-07-02	Genesee Lake	449145	5636089	1	05:08	12.0	0	0	0	0
2022-07-02	Dixie Road N	448493	5636031	1	21:36	13.1	0	15	0	0
2022-07-02	Loop Road	456376	5632539	1	22:01	13.4	1	30	0	2
2022-07-02	Dixie Road N	448493	5636031	2	21:44	12.7	0	15	0	0
2022-07-02	Dixie Road N	448219	5636336	2	22:15	12.8	0	15	0	0
2022-07-02	Loop Road	456648	5632956	2	22:12	12.2	1	20	0	2
2022-07-02	Dixie Road N	448231	5636834	3	22:25	9.9	0	15	0	0
2022-07-02	Dixie Road N	448493	5636031	3	21:51	10.8	0	15	0	0
2022-07-02	Loop Road	456343	5633220	3	22:20	10.2	1	20	0	2
2022-07-02	Dixie Road N	448368	5637310	4	22:35	9.6	0	15	0	0
2022-07-02	Loop Road	455899	5633283	4	22:30	11.7	1	20	0	3
2022-07-02	Dixie Road N	447889	5637222	5	22:45	9.8	0	15	0	0
2022-07-02	Loop Road	455775	5633659	5	22:38	12.5	1	20	0	3
2022-07-02	Dixie Road N	448744	5637648	6	22:57	9.6	0	15	0	0
2022-07-02	Tuzyk's Road	456009	5634112	6	22:47	12.8	1	20	0	4
2022-07-02	Dixie Road N	448813	5638111	7	23:07	8.3	0	15	0	0
2022-07-02	Tuzyk's Road	455607	5634129	7	22:53	12.8	1	20	0	4
2022-07-02	Dixie Road N	448640	5638601	8	23:14	7.9	0	15	0	0
2022-07-02	Tuzyk's Road	455143	5634272	8	23:00	13.2	1	20	0	2

Date	Location	Easting	Northing	Station #	Time Start	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-07-02	Tuzyk's Road	454939	5634636	9	23:08	13.5	1	20	0	2
2022-07-02	Tuzyk's Road	455280	5634931	10	23:15	12.8	1	15	0	2
2022-07-02	Tuzyk's Road	455367	5635524	11	23:24	12.6	1	15	0	2
2022-07-02	Tuzyk's Road	455222	5635839	12	23:31	12.5	1	10	0	2
2022-07-02	Tuzyk's Road	455613	5636120	13	23:38	12.1	1	5	0	2
2022-07-02	Tuzyk's Road	456131	5636269	14	23:45	11.7	1	0	0	2
2022-07-02	Tuzyk's Road	456316	5636679	15	23:52	12.5	1	0	0	2
2022-07-02	Tuzyk's Road	456702	5636950	16	23:59	12.8	1	0	0	1
2022-07-03	Tuzyk's Road	456981	5637065	1	00:07	9.9	1	0	0	1
2022-07-03	Tote Road	461591	5629300	1	22:03	11.6	1	60	0	0
2022-07-03	Tote Road	461885	5629770	2	22:10	11.3	1	50	0	0
2022-07-03	Tuzyk's Road	457193	5637706	2	00:15	11.7	1	0	0	1
2022-07-03	Tote Road	462306	5629880	3	22:16	10.6	1	50	0	0
2022-07-03	Tuzyk's Road	457174	5638234	3	00:22	11.7	1	0	0	1
2022-07-03	Tote Road	462762	5629920	4	22:22	11.8	1	50	0	0
2022-07-03	Tote Road	463260	5629900	5	22:29	12.0	1	30	0	0
2022-07-03	Tote Road	463589	5630230	6	22:36	9.5	1	30	0	0
2022-07-03	Tote Road	463870	5630650	7	22:43	9.2	1	20	0	0
2022-07-03	Tote Road	463963	5631110	8	22:50	8.3	1	20	0	0
2022-07-03	Tote Road	463737	5631520	9	22:56	10.1	1	20	0	0
2022-07-03	Tote Road	463671	5631990	10	23:02	9.5	1	20	0	0
2022-07-03	Tote Road	463584	5632390	11	23:09	10.5	1	20	0	0
2022-07-03	Tote Road	463875	5632780	12	23:16	11.4	1	20	0	0
2022-07-03	Tote Road	463925	5633260	13	23:22	10.7	1	20	0	0
2022-07-03	Tote Road	463807	5633750	14	23:29	10.5	1	30	0	0
2022-07-03	Tote Road	463836	5633930	15	23:35	11.1	1	30	0	0
2022-07-03	Tote Road	464017	5634390	16	23:41	10.8	1	30	0	0
2022-07-03	Tote Road	464260	5634830	17	23:48	9.4	1	20	0	0
2023-06-03	Tuzyk's Road	457289	5633971	1	21:53	23.0	0	0	0	2
2023-06-03	Tuzyk's Road	456861	5633818	2	22:03					
2023-06-03	Tuzyk's Road	456258	5634083	3	22:12					
2023-06-03	Tuzyk's Road	455460	5634106	4	22:23					
2023-06-03	Tuzyk's Road	455030	5634330	5	22:30					
2023-06-03	Tuzyk's Road	454932	5634780	6	22:40					
2023-06-03	Tuzyk's Road	455338	5635037	7	22:49					
2023-06-03	Tuzyk's Road	455344	5635591	8	22:57					
2023-06-03	Tuzyk's Road	455364	5635951	9	23:05					
2023-06-03	Tuzyk's Road	455770	5636219	10	23:12					
2023-06-03	Tuzyk's Road	456237	5636348	11	23:20					
2023-06-03	Tuzyk's Road	456360	5636835	12	23:29					
2023-06-03	Tuzyk's Road	456801	5636958	13	23:35					
2023-06-03	Tuzyk's Road	456982	5637066	14	23:42					
2023-06-03	Tuzyk's Road	457070	5637417	15	23:48					
2023-06-03	Tuzyk's Road	457325	5637900	16	23:55	19.2	0	70	0	1
2023-06-10	Tuzyk's Road	457297	5633990	1	22:04	12.0	0	20	0	2
2023-06-10	Tuzyk's Road	455331	5634178	2	22:16					
2023-06-10	Tuzyk's Road	454932	5634780	3	22:24					
2023-06-10	Tuzyk's Road	455385	5635313	4	22:34					
2023-06-10	Tuzyk's Road	455365	5635964	5	22:41					
2023-06-10	Tuzyk's Road	456266	5636439	6	22:51					
2023-06-10	Tuzyk's Road	456486	5636906	7	22:59					
2023-06-10	Tuzyk's Road	456797	5636949	8	23:07					
2023-06-10	Tuzyk's Road	456985	5637068	9	23:15	9.0	0	0	0	1
2023-06-10	Dixie Road N	448639	5638576	10	23:30	9.0	0	0	0	1
2023-06-10	Dixie Road N	448809	5638111	11	23:38					
2023-06-10	Dixie Road N	448766	5637668	12	23:50					
2023-06-10	Dixie Road N	448386	5637325	13	23:58	8.0	0	0	0	0
2023-06-10	Tuzyk's Road	456970	5637071	1a	21:18	13.0	0	30	0	1
2023-06-10	Tuzyk's Road	456797	5636949	2a	21:25					
2023-06-10	Tuzyk's Road	456473	5636916	3a	21:31					
2023-06-10	Tuzyk's Road	456247	5636443	4a	21:38					
2023-06-10	Tuzyk's Road	455475	5636040	5a	21:46					
2023-06-10	Tuzyk's Road	455389	5635311	6a	21:54					
2023-07-05	Tuzyk's Road	455391	5635308	1	22:02	11.2	0	0	0	1
2023-07-05	Tote Road	464011	5634490	1	23:06	11.7	1	0	0	1
2023-07-05	Tote Road	464011	5634490	1	21:18	16.7	1	0	0	1
2023-07-05	Tuzyk's Road	457302	5633975	2	22:15	10.0	0	0	0	1
2023-07-05	Tote Road	463830	5633952	2	23:00	12.2	1	0	0	1
2023-07-05	Tote Road	463830	5633952	2	21:25	16.6	1	0	0	1
2023-07-05	Tuzyk's Road	455788	5634187	3	22:24	8.4	0	0	0	1
2023-07-05	Tote Road	463918	5633431	3	22:54	12.8	1	0	0	1
2023-07-05	Tote Road	463918	5633431	3	21:32	16.8	1	0	0	1

Date	Location	Easting	Northing	Station #	Time Start	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2023-07-05	Tuzyk's Road	454932	5634779	4	22:33	10.8	0	0	0	1
2023-07-05	Tote Road	463918	5632844	4	22:47	13.2	1	0	0	1
2023-07-05	Tote Road	463918	5632844	4	21:40	16.3	1	0	0	1
2023-07-05	Tuzyk's Road	455391	5635314	5	22:41	9.5	0	0	0	1
2023-07-05	Tote Road	463601	5632433	5	22:40	12.0	1	0	0	1
2023-07-05	Tote Road	463601	5632433	5	21:46	16.1	1	0	0	1
2023-07-05	Tuzyk's Road	455375	5635971	6	22:50	12.1	0	0	0	2
2023-07-05	Tote Road	463730	5631943	6	22:32	12.2	1	0	0	1
2023-07-05	Tote Road	463730	5631943	6	21:52	15.3	1	0	0	1
2023-07-05	Tuzyk's Road	456477	5636914	7	23:01	12.8	0	0	0	1
2023-07-05	Tote Road	463744	5631421	7	22:27	12.7	1	0	0	1
2023-07-05	Tote Road	463744	5631421	7	21:59	13.1	1	0	0	1
2023-07-05	Tuzyk's Road	456981	5637066	8	23:08	10.6	0	0	0	1
2023-07-05	Tote Road	464020	5630977	8	22:06	13.1	1	0	0	1
2023-07-05	Tuzyk's Road	457264	5636938	9	23:16	10.5	1	0	0	1
2023-07-05	Tote Road	463761	5630531	9	22:12	13.3	1	0	0	1
2023-07-05	Tote Road	463447	5630054	10	22:17	14.7	1	0	0	1
2023-07-05	Teardrop Lake	454281	5634889	1a	21:05	13.0	0	0	0	0
2023-07-05	Tuzyk's Road	457168	5638216	2a	21:23	11.6	0	0	0	0
2023-07-05	Tuzyk's Road	457063	5637424	3a	21:33	12.3	0	0	0	0
2023-07-05	Tuzyk's Road	456973	5637070	4a	21:39	10.6	0	0	0	0
2023-07-05	Tuzyk's Road	456468	5636914	5a	21:47	11.6	0	0	0	0
2023-07-05	Tuzyk's Road	455367	5635966	6a	21:56	12.7	0	0	0	1

Appendix 8. Details of autonomous recorder units (ARUs) deployed for bats in the GBR Area of Interest, 2022-2023.

ARU	Location	Easting	Northing	Date Deployed	# Days Operational
Mini Bat 01a	Teardrop Lake (WB01)	454339	5634880	2022-05-19	26
Mini Bat 01b	Teardrop Lake (WB01)	454188	5634821	2022-07-01	27
Mini Bat 02a	WB05 on west side of Tuzyk's Rd by gravel pits	455749	5636349	2022-05-20	43
Mini Bat 02b	northeast shore of Waterbody 01 (south of Teardrop Lake WB01)	454316	5634874	2023-05-17	0
Mini Bat 03a	tributary 1.2 km downstream of Genesee Lake	452412	5634585	2023-05-18	53
Mini Bat 04a	northeast shore of Teardrop Lake at trail terminus	454256	5635456	2023-05-19	48
Mini Bat 05a	south end of clearcut eat of Tributary 03	457753	5633764	2023-05-19	50
Mini Bat 06a	WB05 on west side of Tuzyk's Rd by gravel pits	455749	5636349	2022-05-20	0
Mini Bat 06b	Genesee Lake boat launch	449063	5636159	2022-06-09	82
Mini Bat 06c	east end of former gravel pit east of Tuzyk's Rd	457087	5636825	2023-05-15	51
Mini Bat 07a	rock ridge 1.8 km west of Tuzyk's Rd	454536	5637221	2022-06-04	37
Mini Bat 07b	trail east of Tuzyk's Rd	457124	5636054	2023-05-15	51
Mini Bat 08a	edge of wetland on east of Chukuni River	467792	5631546	2022-06-03	0
Mini Bat 08b	cutover 600 m southwest of Rice Lake (WB06)	459376	5633010	2023-05-19	50
Mini Bat 09a	transmission line ROW 300 m west of Tuzyk's Rd	456670	5637138	2022-05-20	25
Mini Bat 09b	transmission line ROW 1.2 km east of Tuzyk's Rd	458171	5636679	2022-06-27	25
Mini Bat 09c	SE corner of AEX footprint	455369	5634256	2023-06-04	31
Mini Bat 10a	Tributary 04 east of Tuzyk's Rd	456012	5635180	2023-06-09	26
Mini Bat 11a	Dixie Creek at Tributary 03 mouth	458974	5632922	2022-05-21	49
Mini Bat 11b	Tributary 03 north of Tuzyk's Rd	456417	5634549	2023-06-04	31
Mini Bat 12a	southwest shore of Rice Lake (WB06)	459856	5633317	2022-05-21	41
Mini Bat 13a	Bruce Lake	471526	5622137	2022-06-03	42
Mini Bat 13b	1.4 km south of transmission line ROW in cutover along trail towards Tributary 06	448741	5637629	2023-06-10	27
Mini Bat 14a	Gullrock Lake	451330	5638831	2022-06-03	0
Mini Bat 14b	west bank of Chukuni River near transmission line ROW	465066	5633873	2023-06-07	31
Mini Bat 15a	Stone River	448597	5638472	2022-06-03	50
Mini Bat 15b	Tributary 05 east of Tuzyk's Rd	457764	5635868	2023-06-10	27
Mini Bat 16a	Dixie Creek 100 m downstream of Tote Rd bridge	464030	5632158	2023-06-07	31
Mini Bat 17a	west of Tuzyk's Rd and north of gravel pits	455122	5636598	2023-06-08	28
Mini Bat 18a	on beaver pond north of Teardrop Lake (WB01	454218	5636316	2023-06-08	28
Mini Bat 29a	transmission ROW along Hwy 105; 500 m south of Bruce Lake	479362	5614022	2023-06-03	33
Mini Bat 38a	transmission ROW along Hwy 105; 500 m south of Bruce Lake	471964	5621545	2023-06-03	33
SM4-NB 01a	beaver pond northeast of Genessee Lake (WB04)	452937	5636346	2023-05-17	132
SM4-NB 02a	by talus slope northeast of Genessee Lake	451470	5636443	2023-05-17	132
SM4-NB 03a	tributary 1.2 km downstream of Genesee Lake	452418	5634597	2023-06-10	26
SM4-NB 04a	northeast shore of Rice Lake (WB06)	461070	5634080	2023-06-11	107
SM4-NB 05a	Dixie Creek downstream of Tributary 03 mouth	457471	5633392	2023-05-19	50
SM4-NB 11a	Rice Lake Trib at west end of Rice Lake (WB06)	459734	5633546	2023-06-04	95

Appendix 9. Survey plot locations of potential bat maternity roost trees, November 2021.

Date	Survey Point	Easting	Northing	# Snags	Boreal Ecosite	Tree Spp. Composition at Survey Location
2021-11-23	K468	455595	5633165	0	B104	La>Bw>Sb
2021-11-23	K469	455636	5633040	0	B104	La>Sb>Pj
2021-11-24	K473	455487	5632853	0	B104	Sb>Bw>Pj
2021-11-24	K476	455489	5632913	0	B104	Sb>La>Bw
2021-11-24	K478	455409	5632994	0	B104	Bf>Sb>Sw
2021-11-23	K481	455687	5633171	1	B104	SB>Bf
2021-11-23	K489	455633	5632949	0	B104	La>Sb>Bf
2021-11-24	K496	455417	5632933	0	B104	Pj>>Bw>Sb
2021-11-24	K498	455603	5632990	0	B104	
2021-11-21	X905	459284	5635693	0	B104	Clearcut. La regen.
2021-11-21	X907	459395	5635691	0	B104	Clearcut. La regen, Bw
2021-11-21	X909	459115	5635688	0	B104	Clearcut. La regen.
2021-11-21	X910	459577	5635712	0	B104	Clearcut, La regen, Bw, Sb,
2021-11-21	X914	459444	5635734	0	B104	Clearcut. La regen, Bw
2021-11-21	X915	459172	5635692	0	B104	Bw>Sw>Bf
2021-11-21	X919	459486	5635679	0	B104	La>Bw>Sb
2021-11-21	X922	459552	5635778	0	B104	Clearcut. La regen, Bw
2021-11-21	X923	459237	5635665	0	B104	Clearcut. Black ash, SB, Bf, La browse
2021-11-21	X924	459442	5635792	0	B104	Sb>>Bw
2021-11-23	J419	455163	5634277	0	B055	La=Pj>Bf
2021-11-23	J422	455759	5634131	0	B055	La>Bf>Sw
2021-11-23	J426	455678	5634043	0	B055	La>Pj>Bf
2021-11-23	J428	455540	5634056	0	B055	Pj>Sb>La
2021-11-23	J430	455084	5634316	0	B055	La>Pj>Bf
2021-11-23	J431	455298	5634173	1	B055	Bf>La>Sb
2021-11-23	J435	455011	5634270	0	B055	Sparse La, Bf, Bw
2021-11-23	J439	455377	5634134	0	B055	La>>Bf>Sb
2021-11-23	J444	455652	5634084	1	B055	Sb>La>Bw
2021-11-23	J449	455106	5634225	0	B055	Sparse La, Sb, Bw
2021-11-24	K467	455412	5633046	0	B055	Sb>>Bf>Bw
2021-11-22	F336	455342	5635874	0	B040	Pj=Bw
2021-11-22	F337	455633	5636077	0	B040	Pj>Bw>Sb
2021-11-22	F338	455837	5636195	0	B040	Bw>Pj
2021-11-22	F340	455499	5635966	0	B040	Pj>Bw>Sb
2021-11-22	F342	455305	5635831	0	B040	Pj>Bw
2021-11-22	F344	455554	5636068	0	B040	Pj>Sb>Bw
2021-11-22	F346	455614	5636031	0	B040	Bw=Pj>Sb
2021-11-22	F348	455769	5636167	0	B040	Pj>Bw>Bf
2021-11-22	F350	455520	5636016	0	B040	Pj>Bw
2021-11-22	F352	455430	5635978	0	B040	Pj>Bw>Sb
2021-11-24	N596	457796	5632791	1	B055	Sw>Sb>Bw
2021-11-24	R702	455104	5632610	0	B055	La>Sw>Bf
2021-11-24	R703	455408	5632809	0	B055	Bf>Sb>La
2021-11-24	R704	455217	5632733	0	B055	La>>Bf>Sb
2021-11-24	R709	455355	5632786	0	B055	La>Sb>Bw
2021-11-24	R711	455095	5632506	0	B055	Sb>>La
2021-11-24	R719	455009	5632476	0	B055	Sb=La>Pj
2021-11-24	R720	455004	5632575	0	B055	La>>Sb
2021-11-24	R726	455299	5632777	0	B055	La>Sb>Bf
2021-11-24	R728	455175	5632703	1	B055	La>>Bw>Sw
2021-11-21	W870	458593	5634703	0	B104	Clearcut. La regen, Bw

Date	Survey Point	Easting	Northing	# Snags	Boreal Ecosite	Tree Spp. Composition at Survey Location
2021-11-21	W873	458473	5634796	0	B104	Clearcut. La regen, Bw
2021-11-21	W875	458585	5634852	0	B104	Clearcut. La regen, Bw
2021-11-21	W876	458792	5634665	0	B104	Clearcut. La regen, Bw
2021-11-21	W881	458793	5634721	0	B104	Clearcut. La regen, Bw
2021-11-21	W883	458709	5634697	0	B104	Clearcut. La regen, Bw
2021-11-21	W885	458585	5634782	0	B104	Clearcut. La regen, Bw
2021-11-21	W887	458519	5634839	0	B104	Clearcut. La regen, Bw
2021-11-21	W890	458554	5634898	0	B104	Clearcut. La regen, Bw
2021-11-21	W893	458930	5634697	0	B104	Clearcut. La regen, Bw
2021-11-23	I405	453991	5634805	0	B040	Sb>>Pj
2021-11-23	I406	454155	5634823	0	B040	Pj>>Sw>>Bw
2021-11-23	I407	453929	5634699	0	B040	La>>Pj>Bs
2021-11-23	I408	454030	5634761	0	B040	Pj>Bs>Bw
2021-11-23	I409	454060	5634815	0	B040	Pj>Sb>La
2021-11-23	I410	454105	5634769	1	B040	Bw=La
2021-11-23	I411	453958	5634744	0	B040	Pj>>Sb
2021-11-23	I412	453996	5634645	0	B040	Pj>Bw>La
2021-11-23	I413	454085	5634697	0	B040	Pj>>Bf>Bw
2021-11-23	I416	454137	5634719	0	B040	Pj
2021-11-21	Y-927	458923	5635048	0	B104	Bf>Bw>La
2021-11-21	Y931	458982	5635072	0	B104	La>Bf>Sb
2021-11-21	Y936	458865	5635104	0	B104	Bf>Bw>Sb
2021-11-21	Y937	459024	5635098	1	B104	Sb>Bf>Pj
2021-11-21	Y940	458531	5634918	0	B104	La>Bf>Sb
2021-11-21	Y-942	458838	5635053	0	B104	Sb>Bw>Bf
2021-11-21	Y943	458792	5635072	0	B104	La>Bf>Sb
2021-11-21	Y944	458937	5635122	0	B104	La>Bf>Sb
2021-11-21	Y-947	459033	5635166	0	B104	La>Bf>Sb
2021-11-21	Y948	458650	5634994	0	B104	Sb>Bw>Pj
2021-11-24	L544	454959	5632300	0	B055	La>Sb>Bw
2021-11-24	N577	457421	5632733	0	B055	Bw>La
2021-11-24	N578	457666	5632746	0	B055	Bw>La>Sw
2021-11-24	N581	457968	5632788	0	B055	Sb>Sw>Bw
2021-11-24	N586	457567	5632706	0	B055	Bw>>Sw
2021-11-24	N588	457911	5632815	0	B055	Sb>Sw>La
2021-11-24	N589	457836	5632826	0	B055	Sb>Sw>Bw
2021-11-24	N590	458040	5632806	0	B055	Bw>Bf>Sw
2021-11-24	N592	457505	5632723	0	B055	Sw>Bw
2021-11-24	N593	458066	5632861	0	B055	Bf=Bw>Sb
2021-11-24	K502	455542	5632901	0	B055	Sb>>Pj>Bw
2021-11-24	L506	454779	5631962	1	B055	Bw>Sw
2021-11-24	L511	454904	5632141	0	B055	La>Sb>Sw
2021-11-24	L515	454752	5632063	0	B055	Bf>La>Bw
2021-11-24	L519	454855	5632030	0	B055	Bw>Sw>Bf
2021-11-24	L522	454917	5632226	0	B055	Sb>Bw>Pj
2021-11-24	L526	454623	5631966	0	B055	Bs>La>Bw
2021-11-24	L527	454891	5632083	1	B055	Bf>Bw>Sb
2021-11-24	L532	454627	5632030	1	B055	Sw>Bf>Bw
2021-11-24	L533	454713	5631966	0	B055	Bf>Bw>Sw
2021-11-23	H383	454848	5634759	0	B055	La>>Pj>Sb
2021-11-23	H385	454624	5634659	0	B055	La>>Bw>Pj
2021-11-23	H386	454840	5634652	0	B055	Bw>La>Sb
2021-11-23	H388	454699	5634773	0	B055	Pr>>Pj>Sb

Date	Survey Point	Easting	Northing	# Snags	Boreal Ecosite	Tree Spp. Composition at Survey Location
2021-11-23	H389	454791	5634626	0	B055	Bw>Pj
2021-11-23	H390	454722	5634622	0	B055	Sb>Bw
2021-11-23	H392	454755	5634784	0	B055	La>>Pj>Sb
2021-11-23	H393	454785	5634735	0	B055	La>>Pj>Sb
2021-11-23	H396	454667	5634617	0	B055	Pj>Bw>Sb
2021-11-23	H397	454658	5634701	0	B055	La>>Bw>Bf
2021-11-24	R729	455044	5632618	0	B104	La>Sw>Bf
2021-11-22	T774	457824	5637036	0	B104	Pj>La>Sb
2021-11-22	T775	457691	5636917	0	B104	La>>Pj>Bf
2021-11-22	T777	457759	5637103	0	B104	La>>Sw>Pj
2021-11-22	T778	457679	5637045	3	B104	La>>Pj>Sb
2021-11-22	T779	457708	5637100	0	B104	Pj>>La>S
2021-11-22	T781	457732	5636868	0	B104	La>>Sb>Bf
2021-11-22	T783	457822	5637098	0	B104	La>>Pj>Sw
2021-11-22	T784	457756	5637055	0	B104	La>>Sb>Pj
2021-11-22	T785	457684	5636974	0	B104	Pj>>La
2021-11-22	E314	456305	5636487	1	B104	Bw>Sb>Pj
2021-11-22	E315	456496	5636520	0	B104	Pj>>Sb
2021-11-22	E320	456321	5636570	0	B104	Pj>La>S
2021-11-22	E321	456407	5636484	1	B104	Pj>>Sb>Bw
2021-11-22	E323	456365	5636620	0	B104	Pj>Bw>La
2021-11-22	E324	456352	5636518	0	B104	Bw>>Pj
2021-11-22	E326	456509	5636574	0	B104	Pj>Bw>Bs
2021-11-22	E328	456586	5636579	0	B104	Bw>Pj>Sb
2021-11-22	E332	456459	5636556	0	B104	Pj>Sb>Bw
2021-11-22	E334	456399	5636549	0	B104	Pj>Bw>La
2021-11-22	T787	457722	5637014	0	B104	La>>Sb>Pj
2021-11-22	U792	457815	5636761	0	B104	La>>Sb
2021-11-22	U795	457951	5636735	0	B104	La>Sb>Bw
2021-11-22	U798	458004	5636690	0	B104	Sb>Bw>Pj
2021-11-22	U799	457898	5636687	0	B104	Pj>>Sb>Bw
2021-11-22	U805	457815	5636679	0	B104	La>>Sb>Bf
2021-11-22	U809	457879	5636577	0	B104	Sb=Bw
2021-11-22	U811	457895	5636635	0	B104	Bw>La>Bf
2021-11-22	U812	457947	5636576	0	B104	Bw>Sb>Pj
2021-11-22	U813	458008	5636630	0	B104	La>>Bf>Sb
2021-11-22	U814	457748	5636714	0	B104	La>>Bf>Sb

Appendix 10. Location of 2022-2023 morning songbird point counts for the Great Bear Project.

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2022	30-02	455818	5638010	2	2022-06-05	2022-06-27
2022	33-07	467678	5632220	2	2022-06-07	2022-07-04
2022	33-08	468021	5631982	2	2022-06-07	2022-07-04
2022	33-09	468556	5631610	2	2022-06-06	2022-07-04
2022	33-10	468974	5631350	2	2022-06-07	2022-07-04
2022	33-11	469539	5630990	2	2022-06-07	2022-07-04
2022	34-01	469897	5629460	2	2022-06-07	2022-07-04
2022	34-02	469872	5629040	2	2022-06-07	2022-07-04
2022	34-03	469898	5628520	2	2022-06-07	2022-07-04
2022	34-04	469869	5627930	2	2022-06-07	2022-07-04
2022	34-05	469872	5627420	2	2022-06-07	2022-07-04
2022	34-06	469876	5626900	2	2022-06-07	2022-07-04
2022	34-08	469913	5625640	2	2022-06-07	2022-07-06
2022	34-11	469924	5624460	2	2022-06-07	2022-07-06
2022	34-12	469918	5623710	2	2022-06-07	2022-07-06
2022	35-01	469894	5623210	2	2022-06-06	2022-07-06
2022	35-02	470261	5623010	2	2022-06-07	2022-07-06
2022	35-03	470619	5622760	2	2022-06-06	2022-07-06
2022	35-04	471074	5622340	2	2022-06-06	2022-07-05
2022	35-05	471434	5622050	2	2022-06-06	2022-07-05
2022	35-06	471717	5621720	2	2022-06-06	2022-07-05
2022	35-07	472214	5621260	2	2022-06-06	2022-07-05
2022	35-08	472454	5621040	2	2022-06-11	2022-07-05
2022	35-09	472827	5620730	2	2022-06-06	2022-07-05
2022	35-10	473213	5620340	2	2022-06-11	2022-07-05
2022	35-11	473650	5619870	2	2022-06-06	2022-07-05
2022	35-12	474013	5619510	2	2022-06-11	2022-07-05
2022	36-01	474881	5618590	2	2022-06-06	2022-07-04
2022	36-02	475382	5618117	2	2022-06-07	2022-07-04
2022	36-03	475694	5617795	2	2022-06-07	2022-07-05
2022	36-04	476024	5617462	2	2022-06-07	2022-07-05
2022	36-05	476418	5616980	2	2022-06-06	2022-07-04
2022	36-07	477788	5615520	2	2022-06-06	2022-07-06
2022	36-08	478331	5615050	2	2022-06-11	2022-07-06
2022	37-02	479732	5613580	2	2022-06-11	2022-07-06
2022	37-03	480036	5613250	2	2022-06-11	2022-07-06
2022	37-04	480244	5613030	2	2022-06-08	2022-07-06
2022	37-09	482186	5610980	2	2022-06-11	2022-07-05
2022	37-10	482442	5610740	2	2022-06-11	2022-07-05
2022	37-11	482755	5610397	2	2022-06-06	2022-07-05
2022	37-12	483104	5610640	2	2022-06-06	2022-07-05
2022	38-01	484213	5608722	2	2022-06-06	2022-07-05
2022	38-02	483734	5608764	2	2022-06-06	2022-07-05
2022	38-03	483459	5608763	2	2022-06-06	2022-07-05
2022	38-05	482721	5608950	2	2022-06-06	2022-07-05
2022	38-06	482338	5609138	2	2022-06-06	2022-07-05
2022	38-07	482541	5609610	2	2022-06-06	2022-07-05
2022	38-08	482310	5610022	2	2022-06-06	2022-07-05
2022	38-09	482249	5610438	2	2022-06-06	2022-07-05
2022	38-10	483397	5610820	1	2022-07-05	
2022	38-11	483550	5610612	2	2022-06-06	2022-07-05

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2022	38-12	484123	5610353	2	2022-06-06	2022-07-05
2022	40-01	464009	5634550	2	2022-06-05	2022-07-02
2022	40-02	463999	5634200	2	2022-06-05	2022-07-02
2022	40-03	463789	5633780	2	2022-06-05	2022-07-02
2022	40-04	463882	5632850	2	2022-06-05	2022-07-02
2022	40-05	463643	5632450	2	2022-06-05	2022-07-02
2022	40-06	463675	5632040	2	2022-06-05	2022-07-02
2022	40-07	463767	5631740	2	2022-06-05	2022-07-02
2022	40-08	463753	5631490	2	2022-06-05	2022-06-29
2022	40-09	463813	5631240	2	2022-06-05	2022-06-29
2022	40-10	463997	5631100	2	2022-06-05	2022-06-29
2022	40-11	463976	5630850	2	2022-06-05	2022-06-29
2022	40-12	463773	5630550	2	2022-06-05	2022-06-29
2022	42-01	448578	5638520	2	2022-06-08	2022-07-01
2022	42-02	448772	5638280	2	2022-06-08	2022-07-01
2022	42-03	448837	5638050	2	2022-06-08	2022-07-01
2022	42-04	448874	5637800	2	2022-06-08	2022-07-01
2022	42-05	448680	5637610	2	2022-06-08	2022-07-01
2022	42-06	448530	5637420	2	2022-06-08	2022-07-01
2022	42-07	448327	5637280	2	2022-06-08	2022-07-01
2022	42-08	448134	5637120	2	2022-06-08	2022-07-01
2022	42-09	447920	5637260	2	2022-06-08	2022-07-01
2022	42-10	447643	5637280	2	2022-06-08	2022-07-01
2022	42-11	447451	5637060	2	2022-06-08	2022-07-01
2022	42-12	447329	5636810	2	2022-06-08	2022-07-01
2022	43-01	443906	5650630	2	2022-06-10	2022-07-04
2022	43-02	444466	5649380	2	2022-06-10	2022-07-04
2022	43-03	444697	5649070	2	2022-06-10	2022-07-04
2022	43-04	444932	5648620	2	2022-06-10	2022-07-04
2022	43-05	445148	5648210	2	2022-06-10	2022-07-04
2022	43-06	445441	5647900	2	2022-06-10	2022-07-04
2022	43-07	445854	5647160	2	2022-06-10	2022-07-04
2022	43-08	445964	5646850	2	2022-06-10	2022-07-04
2022	43-09	446369	5644470	2	2022-06-10	2022-07-04
2022	43-10	445937	5643350	2	2022-06-10	2022-07-04
2022	43-11	446354	5642220	2	2022-06-10	2022-07-04
2022	43-12	446784	5641770	2	2022-06-10	2022-07-04
2022	01-01	449918	5638259	2	2022-06-04	2022-06-29
2022	01-02	449977	5638030	2	2022-06-04	2022-06-29
2022	01-03	449947	5637780	2	2022-06-04	2022-06-29
2022	01-04	449973	5637530	2	2022-06-04	2022-06-29
2022	01-05	450158	5637289	2	2022-06-04	2022-06-29
2022	01-06	449923	5637107	2	2022-06-04	2022-06-29
2022	01-07	450209	5636904	2	2022-06-04	2022-06-29
2022	01-08	450592	5637123	2	2022-06-04	2022-06-29
2022	01-09	450341	5637392	2	2022-06-04	2022-06-29
2022	13-01	459815	5631740	2	2022-06-10	2022-07-01
2022	14-01	464226	5634760	2	2022-06-05	2022-07-02
2022	15-01	459753	5633540	2	2022-06-09	2022-07-02
2022	16-01	463205	5634980	2	2022-06-12	2022-06-30
2022	17-01	462031	5633854	2	2022-06-08	2022-06-30
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2023	34-12	469933	5623720	2	2023-06-03	2023-07-10
2023	35-01	469896	5623213	2	2023-06-03	2023-07-10
2023	35-02	470260	5623010	2	2023-06-03	2023-07-04
2023	35-03	470624	5622779	2	2023-06-02	2023-07-04
2023	35-04	471072	5622334	2	2023-06-02	2023-07-04
2023	35-05	471716	5621720	2	2023-06-02	2023-07-04
2023	35-06	471906	5621566	2	2023-06-02	2023-07-04
2023	35-07	472212	5621263	2	2023-06-02	2023-07-04
2023	35-08	472454	5621040	2	2023-06-02	2023-07-04
2023	35-09	472827	5620733	2	2023-06-02	2023-07-04
2023	35-10	473215	5620343	2	2023-06-02	2023-07-04
2023	35-11	473551	5620007	2	2023-06-02	2023-07-04
2023	35-12	474016	5619509	2	2023-06-02	2023-07-04
2023	36-01	474882	5618591	2	2023-06-02	2023-07-04
2023	36-02	475378	5618105	2	2023-06-02	2023-07-04
2023	36-03	475683	5617788	2	2023-06-02	2023-07-04
2023	36-04	476009	5617447	2	2023-06-02	2023-07-04
2023	36-05	476417	5616981	2	2023-06-02	2023-07-04
2023	36-07	477794	5615517	2	202306-02	2023-07-04
2023	36-08	478190	5615188	2	2023-06-02	2023-07-04
2023	37-02	479732	5613580	1	2023-06-02	
2023	37-03	480040	5613249	2	2023-06-02	2023-07-04
2023	38-06	482344	5609139	2	2023-06-02	2023-07-04
2023	38-07	482540	5609613	2	2023-06-02	2023-07-04
2023	38-09	482252	5610443	2	2023-06-02	2023-07-04
2023	50-01	457320	5634137	1	2023-06-04	
2023	50-02	457568	5634195	1	2023-06-04	
2023	50-03	457843	5634226	1	2023-06-04	
2023	50-04	457885	5633972	1	2023-06-04	
2023	50-05	457675	5633797	1	2023-06-04	
2023	50-06	457801	5633552	1	2023-06-04	
2023	50-07	458072	5633553	1	2023-06-04	
2023	50-08	458329	5633534	1	2023-06-04	
2023	50-09	459886	5633304	2	2023-06-04	2023-07-08
2023	50-10	459804	5633069	2	2023-06-04	2023-07-08
2023	50-11	460118	5632969	1	2023-07-08	
2023	51-01	457109	5633771	2	2023-06-04	2023-07-10
2023	51-02	456646	5633958	2	2023-06-04	2023-07-10
2023	51-03	456260	5634081	2	2023-06-04	2023-07-10
2023	51-04	455845	5634258	2	2023-06-04	2023-07-10
2023	51-05	455333	5634179	2	2023-06-04	2023-07-08
2023	51-06	454899	5634451	2	2023-06-04	2023-07-08
2023	51-07	454933	5634789	2	2023-06-04	2023-07-08
2023	51-08	455344	5635030	2	2023-06-04	2023-07-08
2023	51-09	455335	5635609	2	2023-06-04	2023-07-08
2023	53-01	455692	5634492	2	2023-06-05	2023-07-05
2023	53-02	455428	5634424	2	2023-06-05	2023-07-05
2023	53-03	455165	5634499	2	2023-06-05	2023-07-05
2023	53-04	455332	5634719	2	2023-06-05	2023-07-05
2023	53-05	455599	5634828	2	2023-06-05	2023-07-05
2023	53-06	455854	5634736	2	2023-06-05	2023-07-05

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2023	53-07	456127	5634690	2	2023-06-05	2023-07-05
2023	53-08	456362	5634870	2	2023-06-05	2023-07-05
2023	53-09	456601	5634915	2	2023-06-05	2023-07-05
2023	53-10	456666	5634666	2	2023-06-05	2023-07-05
2023	53-11	456417	5634555	2	2023-06-05	2023-07-05
2023	53-12	456481	5634302	2	2023-06-05	2023-07-05
2023	54-01	454859	5635518	1	2023-06-05	
2023	54-02	454633	5635687	2	2023-06-05	2023-07-06
2023	54-03	454428	5635536	2	2023-06-05	2023-07-06
2023	54-04	454273	5635408	2	2023-06-05	2023-07-06
2023	54-05	454045	5635507	2	2023-06-05	2023-07-06
2023	54-06	454460	5635898	2	2023-06-05	2023-07-06
2023	54-07	454296	5636092	2	2023-06-05	2023-07-06
2023	54-08	454070	5636092	2	2023-06-05	2023-07-06
2023	54-09	454232	5636270	2	2023-06-05	2023-07-06
2023	54-10	454493	5636295	2	2023-06-05	2023-07-06
2023	54-11	454652	5636113	2	2023-06-05	2023-07-06
2023	54-12	454786	5635909	2	2023-06-05	2023-07-06
2023	55-01	457070	5634126	2	2023-06-06	2023-07-05
2023	55-02	456767	5634365	2	2023-06-06	2023-07-05
2023	55-03	457631	5634535	2	2023-06-06	2023-07-05
2023	55-04	457035	5634852	2	2023-06-06	2023-07-05
2023	55-05	457305	5634855	2	2023-06-06	2023-07-05
2023	55-06	457561	5634797	2	2023-06-06	2023-07-05
2023	55-07	457809	5634838	2	2023-06-06	2023-07-05
2023	55-08	458042	5634965	2	2023-06-06	2023-07-05
2023	55-09	458089	5634713	2	2023-06-06	2023-07-05
2023	55-10	457913	5634534	2	2023-06-06	2023-07-05
2023	55-11	456933	5634539	2	2023-06-06	2023-07-05
2023	55-12	457340	5634620	2	2023-06-06	2023-07-05
2023	56-01	451769	5635116	2	2023-06-06	2023-07-06
2023	56-02	451828	5635531	2	2023-06-06	2023-07-06
2023	56-03	451998	5635743	2	2023-06-06	2023-07-06
2023	56-04	452259	5635694	2	2023-06-06	2023-07-06
2023	56-05	452498	5635595	2	2023-06-06	2023-07-06
2023	56-06	452207	5635900	2	2023-06-06	2023-07-06
2023	56-07	452209	5636143	2	2023-06-06	2023-07-06
2023	56-08	452024	5636309	2	2023-06-06	2023-07-06
2023	56-09	452475	5636133	2	2023-06-06	2023-07-06
2023	56-10	452721	5636228	2	2023-06-06	2023-07-06
2023	56-11	452753	5636461	2	2023-06-06	2023-07-06
2023	56-12	452618	5636698	2	2023-06-06	2023-07-06
2023	57-01	457260	5636936	2	2023-06-08	2023-07-06
2023	57-02	457551	5636842	2	2023-06-08	2023-07-06
2023	57-03	457869	5636753	2	2023-06-08	2023-07-06
2023	57-04	458145	5636658	2	2023-06-08	2023-07-06
2023	57-05	458413	5636501	2	2023-06-08	2023-07-06
2023	57-06	458671	5636335	2	2023-06-08	2023-07-06
2023	57-07	458953	5636184	2	2023-06-08	2023-07-06
2023	57-08	459214	5636003	2	2023-06-08	2023-07-06
2023	57-09	459505	5635867	2	2023-06-08	2023-07-06
2023	57-10	459809	5635735	2	2023-06-08	2023-07-06
2023	57-11	460098	5635600	2	2023-06-08	2023-07-06

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2023	57-12	460392	5635465	2	2023-06-08	2023-07-06
2023	58-01	456172	5633683	2	2023-06-09	2023-07-05
2023	58-02	456426	5633582	2	2023-06-09	2023-07-05
2023	58-03	456329	5633343	2	2023-06-09	2023-07-05
2023	58-04	456537	5633184	2	2023-06-09	2023-07-05
2023	58-05	456779	5633095	2	2023-06-09	2023-07-05
2023	58-06	457037	5633136	2	2023-06-09	2023-07-05
2023	58-07	457302	5633150	2	2023-06-09	2023-07-05
2023	58-08	457557	5633153	2	2023-06-09	2023-07-05
2023	58-09	457811	5633209	2	2023-06-09	2023-07-05
2023	58-10	458045	5633092	2	2023-06-09	2023-07-05
2023	58-11	458256	5632926	2	2023-06-09	2023-07-05
2023	58-12	458512	5632880	2	2023-06-09	2023-07-05
2023	59-01	458154	5634232	2	2023-06-10	2023-07-07
2023	59-02	458421	5634301	2	2023-06-10	2023-07-07
2023	59-03	458249	5634469	2	2023-06-10	2023-07-07
2023	59-04	458376	5634705	2	2023-06-10	2023-07-07
2023	59-05	458736	5634705	2	2023-06-10	2023-07-07
2023	59-06	458995	5634691	2	2023-06-10	2023-07-07
2023	59-07	458551	5634875	2	2023-06-10	2023-07-07
2023	59-08	458739	5635066	2	2023-06-10	2023-07-07
2023	59-09	459016	5634960	2	2023-06-10	2023-07-07
2023	59-10	458992	5635133	2	2023-06-10	2023-07-07
2023	59-11	459140	5635378	2	2023-06-10	2023-07-07
2023	59-12	459272	5635591	2	2023-06-10	2023-07-07
2023	60-01	463895	5633908	2	2023-06-08	2023-07-07
2023	60-02	464165	5633895	2	2023-06-08	2023-07-07
2023	60-03	464460	5633898	2	2023-06-08	2023-07-07
2023	60-04	464711	5633872	2	2023-06-08	2023-07-07
2023	60-05	464933	5633764	2	2023-06-08	2023-07-07
2023	60-06	464700	5633621	2	2023-06-08	2023-07-07
2023	60-07	464359	5633654	2	2023-06-08	2023-07-07
2023	60-08	464109	5633629	2	2023-06-08	2023-07-07
2023	60-09	463826	5633625	2	2023-06-08	2023-07-07
2023	60-10	463576	5633715	2	2023-06-08	2023-07-07
2023	60-11	463342	5633802	2	2023-06-08	2023-07-07
2023	60-12	463264	5634044	2	2023-06-08	2023-07-07
2023	61-01	463456	5632122	2	2023-06-09	2023-07-07
2023	61-02	463118	5632278	2	2023-06-09	2023-07-07
2023	61-03	462825	5632365	2	2023-06-09	2023-07-07
2023	61-04	462548	5632106	2	2023-06-09	2023-07-07
2023	61-05	462125	5631858	2	2023-06-09	2023-07-07
2023	61-06	461657	5631965	2	2023-06-09	2023-07-07
2023	61-07	461287	5631686	2	2023-06-09	2023-07-07
2023	61-08	460958	5631431	2	2023-06-09	2023-07-07
2023	61-09	460657	5631652	2	2023-06-09	2023-07-07
2023	61-10	460281	5631519	2	2023-06-09	2023-07-07
2023	61-11	459796	5631755	2	2023-06-09	2023-07-07
2023	61-12	459423	5631993	2	2023-06-09	2023-07-07
2023	62-01	454693	5635092	2	2023-06-10	2023-07-08
2023	62-02	454580	5634918	2	2023-06-10	2023-07-08
2023	62-03	454235.031	5634921.57	1	2023-06-10	
2023	62-04	454113	5634818	2	2023-06-10	2023-07-08

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2023	62-05	454050	5635028	2	2023-06-10	2023-07-08
2023	62-06	453921	5634596	2	2023-06-10	2023-07-08
2023	62-07	453651	5634482	2	2023-06-10	2023-07-08
2023	62-08	453280	5634459	2	2023-06-10	2023-07-08
2023	62-09	453350	5634695	2	2023-06-10	2023-07-08
2023	62-10	453094	5634345	2	2023-06-10	2023-07-08
2023	62-11	452986	5634572	2	2023-06-10	2023-07-08
2023	62-12	452546	5634808	2	2023-06-10	2023-07-08
2023	63-01	463011	5634515	1	2023-06-11	
2023	63-02	463223	5634814	1	2023-06-11	
2023	63-03	464175	5634586	2	2023-06-11	2023-07-10
2023	63-04	464035	5634386	2	2023-06-11	2023-07-10
2023	63-05	464302	5634378	2	2023-06-11	2023-07-10
2023	63-06	463974	5634150	2	2023-06-11	2023-07-10
2023	63-07	464073	5633318	2	2023-06-11	2023-07-10
2023	63-08	464123	5633091	2	2023-06-11	2023-07-10
2023	63-09	463884	5632858	2	2023-06-11	2023-07-10
2023	63-10	463631	5632460	2	2023-06-11	2023-07-10
2023	63-11	463902	5632465	2	2023-06-11	2023-07-10
2023	63-12	464208	5632456	2	2023-06-11	2023-07-10
2023	65-01	461462	5633807	2	2023-06-11	2023-07-08
2023	65-02	461152	5634140	2	2023-06-11	2023-07-08
2023	65-03	460574	5634153	1	2023-06-11	
2023	65-04	460082	5633831	2	2023-06-11	2023-07-08
2023	65-05	459750	5633552	2	2023-06-11	2023-07-08
2023	65-06	461460	5632753	2	2023-06-11	2023-07-08
2023	65-07	462094	5632948	1	2023-06-11	
2023	65-08	461909	5633285	1	2023-06-11	
2023	65-09	460373	5632959	2	2023-06-11	2023-07-08
2023	65-10	461847	5633638	1	2023-06-11	
2023	00-01	457210	5638247	2	2023-06-01	2023-07-08
2023	00-02	457354	5638023	2	2023-06-01	2023-07-08
2023	00-03	457269	5637701	2	2023-06-01	2023-07-08
2023	00-04	457026	5637607	2	2023-06-01	2023-07-08
2023	00-05	457033	5637353	2	2023-06-01	2023-07-08
2023	00-06	456951	5637078	2	2023-06-01	2023-07-08
2023	00-07	456680	5636912	2	2023-06-01	2023-07-08
2023	00-08	456295	5636917	2	2023-06-01	2023-07-08
2023	00-09	456272	5636647	2	2023-06-01	2023-07-08
2023	00-10	456308	5636380	2	2023-06-01	2023-07-08
2023	00-11	455880	5636261	2	2023-06-01	2023-07-08
2023	00-12	455670	5636105	2	2023-06-01	2023-07-08
2023	00-13	455403	5635926	2	2023-06-01	2023-07-08
2023	08-01x	454962	5635575	1	2023-06-04	
2023	33-10b	469324	5631115	2	2023-06-03	2023-07-10
2023	34-00	469934	5624962	2	2023-06-03	2023-07-10
2023	34-11b	469937	5624179	2	2023-06-03	2023-07-10
2023	35-13	474326	5619185	2	2023-06-02	2023-07-04
2023	35-14	474622	5618875	2	2023-06-02	2023-07-04
2023	36-14	479524	5613800	1	2023-06-02	
2023	37-02b	479721	5613552	1	2023-07-04	
2023	37-14b	479524	5613800	1	2023-07-04	
2023	53-13	456159	5634391	2	2023-06-05	2023-07-05

Year	PC_No2	Easting	Northing	No Visits	Visit 1	Visit 2
2023	54-13	454897	5636246	2	2023-06-05	2023-07-06
2023	55-07c	457809	5634838	1	2023-07-08	
2023	55-13	457203	5634394	2	2023-06-06	2023-07-05
2023	56-13	452428	5636913	2	2023-06-06	2023-07-06
2023	56-14	452187	5637024	2	2023-06-06	2023-07-06
2023	56-15	452080	5637268	2	2023-06-06	2023-07-06
2023	57-13	460666	5635345	2	2023-06-08	2023-07-06
2023	57-14	460957	5635211	2	2023-06-08	2023-07-06
2023	57-15	461246	5635068	2	2023-06-08	2023-07-06
2023	58-13	458394	5632653	2	2023-06-09	2023-07-05
2023	58-14	458378	5632387	2	2023-06-09	2023-07-05
2023	58-15	458123	5632423	2	2023-06-09	2023-07-05
2023	58-16	457881	5632494	2	2023-06-09	2023-07-05
2023	58-17	457619	5632472	2	2023-06-09	2023-07-05
2023	58-18	457362	5632502	2	2023-06-09	2023-07-05
2023	59-13	458970	5635550	2	2023-06-10	2023-07-07
2023	59-14	458697	5635629	2	2023-06-10	2023-07-07
2023	59-15	458464	5635639	2	2023-06-10	2023-07-07
2023	59-16	458179	5635771	2	2023-06-10	2023-07-07
2023	59-17	457807	5635851	2	2023-06-10	2023-07-07
2023	60-13	463531	5634031	2	2023-06-08	2023-07-07
2023	61-13	459379	5632156	2	2023-06-09	2023-07-07
2023	61-14	459194	5632455	2	2023-06-09	2023-07-07
2023	61-15	459029	5632687	2	2023-06-09	2023-07-07
2023	63-13	463387	5632503	2	2023-06-11	2023-07-10
2023	63-14	463926	5631888	2	2023-06-11	2023-07-10
2023	63-15	463653	5631649	2	2023-06-11	2023-07-10

Appendix 11. In-person nocturnal surveys for owls in 2022-2023 at the GBR area of interest.

Date	Location	Station #	Time Start	Easting	Northing	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-04-04	Hwy 105	1	20:43	465367	5635265	0.0	1	0	0	0
2022-04-04	Tote Road	2	20:54	464539	5634991					
2022-04-04	Tote Road	3	21:07	463832	5633932					
2022-04-04	Tote Road	4	21:18	463619	5632474					
2022-04-04	Tote Road	5	21:29	463982	5631086					
2022-04-04	Tote Road	6	21:48	463180	5629932					
2022-04-04	Tote Road	7	22:00	461761	5629614					
2022-04-04	Hwy 105	8	22:34	460967	5637113					
2022-04-04	Tuzyk's Road	9	22:46	457165	5638214					
2022-04-04	Tuzyk's Road	10	22:55	456661	5636934					
2022-04-04	Tuzyk's Road	11	23:04	455466	5636032					
2022-04-04	Tuzyk's Road	12	23:14	454934	5634784					
2022-04-04	Tuzyk's Road	13	23:24	456181	5634114					
2022-04-04	Dixie Road N	14	23:50	448642	5638571					
2022-04-04	Dixie Road N	15	00:01	448266	5636967	-5.0	1	0	0	0
2022-04-05	Loop Road	1	21:24	456854	5631557	-5	3-4	100	0	0
2022-04-05	Loop Road	2	21:41	455253	5631239	-5	3-4	100	0	0
2022-04-05	Loop Road	3	21:53	455261	5632784	-5	3-4	100	0	0
2022-05-06	Tuzyk's Road	1	21:35	457166	5638217	12.1	2	30	0	0
2022-05-06	Tuzyk's Road	2	21:47	457063	5637356					
2022-05-06	Tuzyk's Road	3	21:57	456329	5636740					
2022-05-06	Tuzyk's Road	4	22:09	455602	5636124					
2022-05-06	Tuzyk's Road	5	22:19	454987	5635417					
2022-05-06	WB02	6	22:28	454284	5634895					
2022-05-06	Tuzyk's Road	7	22:42	454938	5634781					
2022-05-06	Tuzyk's Road	8	22:52	455574	5634112					
2022-05-06	Tuzyk's Road	9	23:01	456579	5633975					
2022-05-06	Loop Road	10	23:11	455731	5633458					
2022-05-06	Loop Road	11	23:23	455575	5632923					
2022-05-06	Loop Road	12	23:40	454835	5631852					
2022-05-06	Loop Road	13	23:49	455131	5631263					1
2022-05-06	Loop Road	14	23:58	455931	5631495					
2022-05-06	Loop Road	15	00:09	456307	5632332					
2022-05-06	Loop Road	16	00:21	456428	5633200	7.5	2	20	0	0
2022-05-07	Hwy 105	1	21:15	464983	5634820	11.0	2	70	0	1
2022-05-07	Tote Road	2	21:59	464214	5634771					1
2022-05-07	Tote Road	3	22:09	463858	5633616					1
2022-05-07	Tote Road	4	22:18	463748	5632677					
2022-05-07	Tote Road	5	22:33	463742	5631689					
2022-05-07	Tote Road	6	22:43	463980	5630838					
2022-05-07	Tote Road	7	22:53	463431	5630019					
2022-05-07	Tote Road	8	23:01	462580	5629966					
2022-05-07	Tote Road	9	23:11	461594	5629312					
2022-05-07	Tote Road	10	23:20	461835	5628508					
2022-05-07	Hwy 105	11	23:47	462043	5636336					
2022-05-07	Hwy 105	12	23:56	459031	5637961	6.0	2	30	0	0
2022-05-08	Hwy 105	1	21:19	457531	5638852	8.0	2	100	0	1
2022-05-08	Hwy 105	2	21:30	455942	5638554					1
2022-05-08	Hwy 105	3	21:40	453921	5638936					1
2022-05-08	Hwy 105	4	21:51	451659	5638921					1
2022-05-08	Dixie Road N	5	22:00	449598	5638352					1

Date	Location	Station #	Time Start	Easting	Northing	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-05-08	Dixie Road N	6	22:12	448740	5638331					1
2022-05-08	Dixie Road N	7	22:21	448424	5637354					1
2022-05-08	Dixie Road N	8	22:28	448221	5636419					1
2022-05-08	Dixie Road N	9	22:35	448990	5635917					1
2022-05-08	Dixie Road N	10	22:42	449545	5635205					1
2022-05-08	Dixie Road N	11	22:49	449682	5634544					1

Appendix 12. In-person Marsh Monitoring Program survey stations for marsh birds and amphibians in 2022-2023 at the GBR area of interest.

Date	Location	Easting	Northing	Station #	Time Start	AM / PM	Air Temp (°C)	Wind (Beauf.)	% Cloud Cover	Precip.	Noise Disturbance Code
2022-06-08	Loop Road	455898	5633805	1	06:52	PM	25.0	0	0	0	0
2022-06-08	Dixie Creek	455618	5633864	2	07:10	PM	25.0	0	0	0	0
2022-06-10	Teardrop Lake (WB01)	454106	5635088	1	21:39	PM	20.4	0	0	0	0
2022-06-10	Teardrop Lake (WB01)	453996	5635496	2	22:03	PM	19.2	0	0	0	0
2022-06-11	Rice Lake (WB06)	461167	5634162	1	19:21	PM	21.0	2	0	0	0
2022-06-11	Rice Lake (WB06)	462081	5633055	1	20:58	PM	21.0	2	0	0	0
2022-06-11	Rice Lake (WB06)	459802	5633703	2	21:39	PM	18.4	2	0	0	0
2022-06-11	Rice Lake (WB06)	462947	5632808	2	19:58	PM	22.0	2	0	0	0
2022-07-05	Teardrop Lake (WB01)	453996	5635496	1	20:00	PM	23.0	2	0	0	0
2022-07-05	Teardrop Lake (WB01)	454106	5635088	2	19:40	PM	23.0	2	0	0	0
2022-07-05	WB02	454277	5634856	3	19:28	PM	23.0	0	0	0	0
2022-07-05	Genessee Lake (boat launch)	449144	5636090	4	20:52	PM	21.0	0	0	0	0
2023-06-01	Rice Lake	461070	5634080	1	06:20	AM	6.0	0	0	0	0
2023-06-10	Teardrop Lake (WB01)	454235	5634922	62-03	06:30	AM	4.0	0	2	0	0
2023-06-11	Rice Lake (WB06)	461070	5634080	1	06:19	AM	9.0	0	0	0	0
2023-06-11	Rice Lake (WB06)	460490	5634024	2	06:58	AM	10.0	0	0	0	0
2023-06-11	Rice Lake (WB06)	459750	5633552	3	07:38	AM	10.0	0	0	0	0
2023-06-11	Rice Lake (WB06)	461460	5632753	4	08:15	AM	12.0	0	0	0	0
2023-06-11	Rice Lake (WB06)	462094	5632948	5	08:33	AM	19.0	0	0	0	0
2023-07-08	Rice Lake (WB06)	461462	5633807	65-01	09:24	AM	20.2	1	1	0	0
2023-07-08	Rice Lake (WB06)	461152	5634140	65-02	09:02	AM	19.3	0	1	0	0
2023-07-08	Rice Lake (WB06)	460082	5633831	65-04	08:34	AM	18.3	0	1	0	0
2023-07-08	Rice Lake (WB06)	459750	5633552	65-05	08:14	AM	17.1	0	1	0	0
2023-07-08	Rice Lake (WB06)	461460	5632753	65-06	10:05	AM	18.2	1	2	0	0
2023-07-08	Rice Lake (WB06)	462094	5632948	65-07	09:45	AM	18.4	1	2	0	0
2023-07-08	Rice Lake (WB06)	460373	5632959	65-09	07:54	AM	21.1	0	1	0	0

Appendix 13. Autonomous recording units (ARU) deployed in the GBR Project area for birds and amphibians, 2022-2023*.

ARU	Location	Easting	Northing	Date Deployed	# Days Operational
Micro 01a	transmission line ROW 1 km east of Tuzyk's Rd	457965	5636734	2022-04-05	45
Micro 01b	loop road south of Dixie Creek	456587	5632856	2022-05-23	0
Micro 01c	northwest corner of AEX footprint	455104	5634698	2023-06-09	26
Micro 02a	trail south of Dixie Creek near wolverine set #1	457609	5633167	2022-04-05	48
Micro 02b	transmission line ROW along Hwy 105 near Pakwash P.P.	470636	5622734	2022-06-03	82
Micro 02c	cutover south of Dixie Creek	457078	5632580	2023-06-09	26
Micro 03a	transmission line ROW north of Rice Lake (WB06)	462254	5634686	2022-04-05	46
Micro 03b	transmission line ROW north of Rice Lake (WB06)	460778	5635326	2022-05-30	111
Micro 03c	along Tuzyk's Rd near junction with Teardrop Lake (WB01) trail	455281	5635470	2023-06-09	26
Micro 04a	Tote Rd by Dixie Creek bridge	463722	5631979	2022-04-05	44
Micro 04b	Tote Rd by Dixie Creek bridge	463492	5632150	2022-05-19	75
Micro 04c	gravel pit east of Tuzyk's Rd	456548	5636875	2023-06-09	26
Micro 05a	meadow marsh along Dixie Rd N, east of oval waterbody (WB07)	448199	5636630	2022-04-05	46
Micro 05b	oval waterbody west of Dixie Rd N (WB07))	448041	5636567	2022-05-21	44
Micro 05c	along existing transmission ROW west of Tuzyk's Rd	456809	5637161	2023-06-09	26
Micro 06a	WB02 on west side of Tuzyk's Rd by gravel pits	455751	5636349	2022-04-05	45
Micro 06b	trail south of Dixie Creek near wolverine set #1	457601	5633171	2022-05-23	90
Micro 06c	transmission line ROW north of Rice Lake (WB06)	462851	5634371	2023-07-04	33
Micro 07a	east side of Tuzyk's Rd in Pj forest	455402	5635154	2022-04-03	48
Micro 07b	200 m west of WB03	449807	5637042	2022-06-03	78
Micro 07c	Pj woodland near trail 1.4 km east of Genesee Lake	452620	5634722	2023-06-10	21
Micro 08a	loop road south of Dixie Creek	456582	5632867	2022-04-03	50
Micro 08b	transmission line ROW 800 m E of Tote Rd	464049	5633950	2022-06-03	80
Micro 08c	gravel pit on west side of Tote Rd	464052	5634593	2023-06-10	28
Micro 09a	Rice Lake (WB06) trail at junction #2	459790	5632923	2022-04-06	45
Micro 09b	west of Tuzyk's Rd	454724	5636536	2022-05-23	2
Micro 09c	Tote Rd along side trail 1/2 way to Dixie Cr bridge	456424	5633578	2023-07-04	31
Micro 10a	cutover north of Rice Lake (WB06) (STGR lek)	462296	5633879	2022-04-05	2
Micro 10b	cutover north of Rice Lake (WB06) (STGR lek)	462292	5633879	2022-05-21	93
Micro 10c	marsh along west side of Dixie Cr loop road	455643	5633199	2023-07-04	0
Micro 11a	transmission line ROW along Hwy 105 5 km southeast of Bruce Lake	474937	5618647	2022-06-02	83
Micro 11b	west of Dixie Lake Rd N in between unnamed waterbodies	447966	5637270	2023-06-10	26
Micro 12a	transmission line ROW near Ear Falls	481027	5612215	2022-06-30	55
Micro 12c	landing on Dixie Creek loop road	456368	5632006	2023-07-04	33
Micro 13a	transmission line ROW along Hwy 105 at Bruce Lake	477901	5615555	2022-06-02	91
Micro 13b	Dixie Creek loop road	448741	5637629	2023-07-04	32

ARU	Location	Easting	Northing	Date Deployed	# Days Operational
Micro 14a	transmission line ROW along Hwy 105 3.2 km southeast of Bruce Lake	473736	5619903	2022-06-02	83
Micro 14b	transmission line ROW 2.4 km east of Tuzyk's Rd	459151	5636095	2023-06-08	28
Micro 15a	transmission line ROW 3.4 km east of Tuzyk's Rd	460057	5635657	2022-06-12	115
Micro 15b	transmission line ROW 3.5 km east of Tuzyk's Rd	460158	5635606	2023-06-08	28
Micro 16a	transmission line ROW along Hwy 105 500 m southeast of Bruce Lake	471801	5621782	2022-06-02	83
Micro 16b	transmission line ROW 1.7 km east of Tuzyk's Rd	458538	5636456	2023-06-08	28
Micro 17a	Teardrop Lake (WB01)	454242	5635069	2022-05-19	89
Micro 17b	transmission line ROW 1.2 km east of Tuzyk's Rd	458171	5636673	2023-06-06	30
Micro 18a	inactive gravel pit on Tuzyk's Rd	456675	5636887	2023-07-04	31
Micro 19a	transmission line ROW 1 km east of Tuzyk's Rd	457969	5636728	2022-05-20	56
Micro 19b	transmission ROW along Hwy 105; 7 km south of Bruce Lake	476732	5616746	2023-06-03	33
Micro 20a	600 m south of transmission line ROW in cutover along trail towards Tributary 06	458952	5635504	2023-06-10	27
Mini Bat 01a	Teardrop Lake (WB01)	454339	5634880	2022-05-19	26
Mini Bat 01b	Teardrop Lake (WB01)	454188	5634821	2022-07-01	27
Mini Bat 02a	WB02 on west side of Tuzyk's Rd by gravel pits	455749	5636349	2022-05-20	43
Mini Bat 02b	northeast shore of WB02 (south of Teardrop Lake (WB01))	454316	5634874	2023-05-17	0
Mini Bat 03a	tributary 1.2 km downstream of Genesee Lake	452412	5634585	2023-05-18	53
Mini Bat 04a	northeast shore of Teardrop Lake (WB01) at trail terminus	454256	5635456	2023-05-19	48
Mini Bat 05a	south end of clearcut eat of Tributary 03	457753	5633764	2023-05-19	50
Mini Bat 06a	WB02 on west side of Tuzyk's Rd by gravel pits	455749	5636349	2022-05-20	0
Mini Bat 06b	Genesee Lake boat launch	449063	5636159	2022-06-09	82
Mini Bat 06c	east end of former gravel pit east of Tuzyk's Rd	457087	5636825	2023-05-15	51
Mini Bat 07a	rock ridge 1.8 km west of Tuzyk's Rd	454536	5637221	2022-06-04	37
Mini Bat 07b	trail east of Tuzyk's Rd	457124	5636054	2023-05-15	51
Mini Bat 08a	edge of wetland on east of Chukuni River	467792	5631546	2022-06-03	0
Mini Bat 08b	cutover 600 m southwest of Rice Lake (WB06)	459376	5633010	2023-05-19	50
Mini Bat 09a	transmission line ROW 300 m west of Tuzyk's Rd	456670	5637138	2022-05-20	25
Mini Bat 09b	transmission line ROW 1.2 km east of Tuzyk's Rd	458171	5636679	2022-06-27	25
Mini Bat 09c	SE corner of AEX footprint	455369	5634256	2023-06-04	31
Mini Bat 10a	Tributary 04 east of Tuzyk's Rd	456012	5635180	2023-06-09	26
Mini Bat 11a	Dixie Creek at Tributary 03 mouth	458974	5632922	2022-05-21	49
Mini Bat 11b	Tributary 03 north of Tuzyk's Rd	456417	5634549	2023-06-04	31
Mini Bat 12a	southwest shore of Rice Lake (WB06)	459856	5633317	2022-05-21	41
Mini Bat 13a	Bruce Lake	471526	5622137	2022-06-03	42
Mini Bat 13b	1.4 km south of transmission line ROW in cutover along trail towards Tributary 06	448741	5637629	2023-06-10	27
Mini Bat 14a	Gullrock Lake	451330	5638831	2022-06-03	0
Mini Bat 14b	west bank of Chukuni River near transmission line ROW	465066	5633873	2023-06-07	31

ARU	Location	Easting	Northing	Date Deployed	# Days Operational
Mini Bat 15a	Stone River	448597	5638472	2022-06-03	50
Mini Bat 15b	Tributary 05 east of Tuzyk's Rd	457764	5635868	2023-06-10	27
Mini Bat 16a	Dixie Creek 100 m downstream of Tote Rd bridge	464030	5632158	2023-06-07	31
Mini Bat 17a	west of Tuzyk's Rd and north of gravel pits	455122	5636598	2023-06-08	28
Mini Bat 18a	on beaver pond north of Teardrop Lake (WB01)	454218	5636316	2023-06-08	28
Mini Bat 29a	transmission ROW along Hwy 105; 500 m south of Bruce Lake	479362	5614022	2023-06-03	33
Mini Bat 38a	transmission ROW along Hwy 105; 500 m south of Bruce Lake	471964	5621545	2023-06-03	33
Mini Bird 01a	north shore of Teardrop Lake (WB01)	454051	5635498	2023-06-05	31
Mini Bird 02a	north shore of Rice Lake (WB06)	460486	5634027	2023-06-11	27
Mini Bird 03a	tributary 1.2 km downstream of Genesee Lake	452418	5634597	2023-06-10	26
Mini Bird 04a	oval waterbody west of Dixie Rd N (WB07)	448039	5636580	2023-06-10	26
Mini Bird 05a	Genesee Lake boat launch	449083	5636140	2023-06-10	26
Mini Bird 06a	northwest shore of Rice Lake (WB06)	460076	5633831	2023-06-11	27
Mini Bird 07a	south shore of Rice Lake (WB06)	461442	5632756	2023-06-11	27
Mini Bird 08a	northeast shore of Rice Lake (WB06)	461070	5634080	2023-06-11	27
Mini Bird 09a	outlet at east shore of Rice Lake (WB06)	462099	5632948	2023-06-11	27
Mini Bird 10a	Rice Lake (WB06) Trib at west end of Rice Lake (WB06)	459735	5633557	2023-06-11	27

Appendix 14. Summary of interpretation effort of 2022-2023 autonomous recording unit audio files.

Recording Date	Micro 01	Micro 02	Micro 03	Micro 04	Micro 05	Micro 06	Micro 07	Micro 08	Micro 09	Micro 10	Micro 11	Micro 12	Micro 13	Micro 14	Micro 15	Micro 16	Micro 17	Micro 18	Micro 19	Micro 20	MiniBat 01	MiniBat 02	MiniBat 06	MiniBat 07	MiniBat 08	MiniBat 09	MiniBat 11	MiniBat 13	MiniBat 15	MiniBird 01	MiniBird 02	MiniBird 03	MiniBird 04	MiniBird 05	MiniBird 06	MiniBird 07	MiniBird 08	MiniBird 09	MiniBird 10	Grand Total
2022-05-19	1																																						1
2022-05-20									2																															2
2022-05-23	1								3																															4
2022-06-10																										3														3
2022-06-11						3		2													3		3			3														14
2022-06-13		3	3	3	3	3	3	2		3	3		3	3	3	3	3		3		3	3	3	3		3	3	3	3											68
2022-06-14		3	3	3	3	3	3			1	1																													20
2022-06-15		3	2	3	1	3	1	3		3	3				3	3	3		3			3		3			3		3											46
2022-06-16								1					3	3														3												10
2022-07-01					1																																		1
2022-07-02					1																	3																	4
2022-07-03					1																																		1
2022-07-07		3	4	3		3	3	3		3	3	3	2	3	3	3	3		3					3			3	3	3										57
2022-07-08													1																											1
2023-06-08														3		3	3		3							3				3										18
2023-06-09	3	3	3	3	3										3																									18
2023-06-10							3	3												3			3	3	3							3		3						24
2023-06-11											3																				3		3		3	3	3	3	3	24
2023-06-17	3																																							3
2023-06-19		3						3																																6
2023-06-22					3									3																2							3		11
2023-06-23															3		3		3	3										1	3	3	3	3	3		3		3	34
2023-06-24			3								3																								3					9
2023-06-27							3																																	3
2023-06-30							3																														3			6
2023-07-01				3																				3	3	1								3						13
2023-07-02	3	3	3		3						3				3															3	3	3	3	3		3		3	3	42
2023-07-03				3				3						3		3	3		3	3			2																	23
2023-07-05						3						3	3			3		3																						15
2023-07-07									3																															3
2023-07-15												3	3					3																						9
2023-07-18									3																															3
2023-07-20						3																																		3
2023-07-30												3																												3

Recording Date	Micro 01	Micro 02	Micro 03	Micro 04	Micro 05	Micro 06	Micro 07	Micro 08	Micro 09	Micro 10	Micro 11	Micro 12	Micro 13	Micro 14	Micro 15	Micro 16	Micro 17	Micro 18	Micro 19	Micro 20	MiniBat 01	MiniBat 02	MiniBat 06	MiniBat 07	MiniBat 08	MiniBat 09	MiniBat 11	MiniBat 13	MiniBat 15	MiniBird 01	MiniBird 02	MiniBird 03	MiniBird 04	MiniBird 05	MiniBird 06	MiniBird 07	MiniBird 08	MiniBird 09	MiniBird 10	Grand Total
2023-08-02						3			3																															6
2023-08-03													3					3																						6
2023-05-27																							3																	3
2023-06-03																							3		3															6
2023-07-04																							1																	1
2023-05-31																								3																3
2023-06-05																								3																3
2023-06-02																									3															3
2023-06-16																										3														3
Grand Total	**11**	**21**	**21**	**21**	**19**	**24**	**19**	**20**	**14**	**10**	**19**	**12**	**18**	**18**	**18**	**18**	**18**	**9**	**18**	**9**	**6**	**9**	**18**	**21**	**12**	**16**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**536**

Appendix 15. Summary of 2021-2023 waterfowl surveys in the GBR Project landscape.

Survey #	Date	Survey Type	Location	Observers	Survey Time	Air Temp (°C)	Wind (Beauf.)	Cloud (% cover)	Precip.
1	2021-10-13	boat survey	Rice Lake (WB06)	DB, RF	12:00 - 13:00	9	2-3	90-100	
2	2022-05-09	stationary survey	Teardrop Lake (WB01)	AS, LS	20:15 - 20:45	8	0-1	0	
3	2022-06-07	stationary survey	Teardrop Lake (WB01)	RF	10:30 - 10:40	17	0-1	0	
4	2022-06-07	stationary survey	Teardrop Lake (WB01)	RF	15:30 - 15:40	16	0-1	10	
5	2022-06-13	boat survey	Rice Lake (WB06)	RF, EW	08:00 - 09:30	14	0-1	0	
6	2022-07-04	canoe survey	Waterbody WB07	AS, NB	14:00 - 16:00	21	1	100	
7	2022-07-07	stationary survey	Teardrop Lake (WB01)	AS, LS	17:00 - 17:30	23	0-1	0	
8	2022-07-07	stationary survey	Waterbody WB02	AS, LS	17:30 - 18:30	23	0-1	0	
9	2022-07-08	stationary survey	Genesee Lake trib	AS, LS	18:37 - 18:47	24	0-1	0	
10	2022-07-08	stationary survey	Gullrock Lake	AS, LS	21:50 - 22:05	21	0-1	0	
11	2022-07-08	stationary survey	GullRock Lake at Mud Creek	AS, LS	17:15 - 17:55	25	0-1	0	
12	2022-07-08	stationary survey	Stone Creek	AS, LS	17:55 - 18:20	25	0-1	0	
13	2022-07-08	stationary survey	Teardrop Lake (WB01)	AS, LS	12:30 - 14:40	24	0-1	0	
14	2022-07-08	stationary survey	Waterbody WB07	AS, LS	18:25 - 18:35	24	0-1	0	
15	2022-07-09	stationary survey	Dixie Creek at Tote Road	AS, LS	08:00 - 08:10	23	1	0	
16	2022-08-22	stationary survey	Teardrop Lake (WB01)	RF	12:15 - 12:30	17	0	100	0
17	2022-08-22	stationary survey	Teardrop Lake (WB01)	LS, RF	16:15 - 16:25	20	1	90	
18	2022-08-23	canoe survey	Teardrop Lake (WB01)	LS, RF	09:50 - 10:30	17	1	2	
19	2022-08-24	canoe survey	Teardrop Lake (WB01)	LS, RF	10:05 - 10:20	14	3	100	0
20	2022-08-25	stationary survey	Rice Lake (WB06)	LS, RF	09:45 - 10:45	14	0	0	0
21	2022-09-05	canoe survey	Teardrop Lake (WB01)	AH, AS	12:00 - 13:00	23 - 23	2	0	0
22	2022-09-05	stationary survey	Rice Lake (WB06)	AH, AS	09:50 - 11:00	17 - 18	1-3	0	0
23	2022-09-05	stationary survey	Rice Lake (WB06)	AH, AS	17:00 - 18:10	23 - 24	1-2	10	0
24	2022-09-06	canoe survey	Teardrop Lake (WB01)	AH, AS	13:00 - 13:50	22 - 24	1	20-100	0
25	2022-09-06	stationary survey	Rice Lake (WB06)	AH, AS	09:20 - 10:20	18 - 19	2	100	0
26	2022-09-06	stationary survey	Rice Lake (WB06)	AH, AS	17:20 - 18:20	25 - 26	3-4	5	0
27	2022-09-07	canoe survey	Teardrop Lake (WB01)	AH, AS	10:05 - 11:55	24	0	5	0
28	2022-09-07	stationary survey	Rice Lake (WB06)	AH, AS	12:45 - 13:45	22 - 24	3-4	10	0
29	2022-09-21	stationary survey	Rice Lake (WB06)	AS, LS	18:00 - 19:00	9	3	75-80	0
30	2022-09-22	canoe survey	Teardrop Lake (WB01)	AS, LS	16:30 - 18:20	9 - 10	1-3	0	0
31	2022-09-22	stationary survey	Rice Lake (WB06)	AS, LS	09:40 - 10:50	6 - 10	1	0	0
32	2022-09-23	canoe survey	Teardrop Lake (WB01)	AS, LS	13:00 - 15:25	14 - 15	1-2	100	0
33	2022-09-23	stationary survey	Rice Lake (WB06)	AS, BR	10:00 - 10:30	9-11	0-1	100	0
34	2022-09-23	stationary survey	Rice Lake (WB06)	AS, LS	10:15 - 11:20	10 - 12	2	95-100	0
35	2022-09-24	canoe survey	Teardrop Lake (WB01)	AS, LS	10:45- 11:50	14 - 16	1-2	100	0
36	2022-10-05	canoe survey	Teardrop Lake (WB01)	BR, RF	14:05 - 14:35	12	3	40	0

Survey #	Date	Survey Type	Location	Observers	Survey Time	Air Temp (°C)	Wind (Beauf.)	Cloud (% cover)	Precip.
37	2022-10-05	stationary survey	Rice Lake (WB06)	BR, RF	15:25 - 16:25	13	3	50	0
38	2022-10-06	canoe survey	Teardrop Lake (WB01)	BR, RF	11:40 - 12:25	1	3	60	0
39	2022-10-06	stationary survey	Rice Lake (WB06)	BR, RF	13:25 - 13:55	1	2	90	0
40	2023-05-15	stationary survey	Rice Lake (WB06)	BR, LG	16:20 - 15:05	27	3-4	10	0
41	2023-05-15	stationary survey	Teardrop Lake (WB01)	BR, LG	09:35 - 10:35	17	2-3		
41	2023-05-16	aerial survey	Dixie Creek	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Dixie Lake	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Genesee Lake	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Rice Lake (WB06)	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Teardrop Lake (WB01)	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Teardrop Lake (WB01)	BR, EM, LG	15:38 - 17:38	11	1	5	0
41	2023-05-16	aerial survey	Waterbody WB03	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Waterbody WB04	BR, EM, LG	12:00 - 13:30	11	1	5	0
41	2023-05-16	aerial survey	Waterbody WB07	BR, EM, LG	12:00 - 13:30	11	1	5	0
42	2023-05-16	stationary survey	Rice Lake (WB06)	BR, LG	08:27 - 09:27	7	2	2	0
43	2023-05-16	stationary survey	Teardrop Lake (WB01)	BR, LG	16:02 - 17:02	16	2-3	30	0
44	2023-05-17	stationary survey	Rice Lake (WB06)	BR, LG	16:17 - 17:17	19	2-3	100	0
45	2023-05-17	stationary survey	Teardrop Lake (WB01)	BR, LG	08:15 - 09:15	10	1-2	95	
46	2023-05-18	stationary survey	Rice Lake (WB06)	BR, LG	08:32 - 09:32	7	2-3	98	0
47	2023-05-18	stationary survey	Teardrop Lake (WB01)	BR, LG	16:35 - 17:05	12	1-2	100	int. rain
48	2023-05-19	stationary survey	Rice Lake (WB06)	BR, LG	15:03 - 16:03	18	3	10	0
49	2023-05-19	stationary survey	Teardrop Lake (WB01)	BR, LG	07:43 - 08:43	5	1-2	30	0
50	2023-06-02	canoe survey	Teardrop Lake (WB01)	LG, BM	15:30 - 16:35	5	1-2	30	0
51	2023-06-02	stationary survey	Waterbody WB02	LG, BM	15:00 - 15:45	5	1-2	30	0
52	2023-06-10	stationary survey	Teardrop Lake (WB01)	LG, RF	07:00 - 07:10	9	0	0	0
53	2023-06-10	stationary survey	Waterbody WB02	LG, RF	06:30 - 06:35	8	0	0	0
54	2023-07-06	canoe survey	Waterbody WB07	LG, BM	14:45 - 15:55	18	2-3	0	
55	2023-07-08	boat survey	Rice Lake (WB06)	LG, LS	09:00 - 10:30	20	1	5	0
56	2023-08-19	stationary survey	Teardrop Lake (WB01)	Rf, BR	11:00 - 11:15	24	2-3	20	
57	2023-08-19	stationary survey	Waterbody WB07	RF, BR	15:45 - 16:00	26	23-3	80	
58	2023-09-05	aerial survey	#1 W of Boyden Lake	AH, BR	15:38 - 17:38	20	0	100	
58	2023-09-05	aerial survey	#2 Bug River area	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	#3 Stone Creek area	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	#4 SW of Dixie Road	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	#5 upper Dixie Creek	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	#6 S of Tote Road	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	#7 upper Chukuni River	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	Dixie Lake	AH, BR	15:38 - 17:38				

Survey #	Date	Survey Type	Location	Observers	Survey Time	Air Temp (°C)	Wind (Beauf.)	Cloud (% cover)	Precip.
58	2023-09-05	aerial survey	Hiewall Lake	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	Rice Lake (WB06)	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	Teardrop Lake (WB01)	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	Waterbody WB07	AH, BR	15:38 - 17:38				
58	2023-09-05	aerial survey	Waterbody WB08	AH, BR	15:38 - 17:38				
59	2023-09-05	stationary survey	Rice Lake (WB06)	AH, BR	08:45 - 09:45	18	1	100	0
60	2023-09-06	canoe survey	Teardrop Lake (WB01)	AH, BR	08:55 - 09:15	10	2	100	0
61	2023-09-06	canoe survey	Teardrop Lake (WB01)	AH, BR	09:20 - 13:15	10	2	100	0
62	2023-09-06	stationary survey	Rice Lake (WB06)	AH, BR	02:33 - 03:23	13	1	100	0
63	2023-09-07	boat survey	Rice Lake (WB06)	AH, BR	8:50 - 13:00	6	2	100	0
64	2023-09-07	canoe survey	Teardrop Lake (WB01)	AH, BR	14:05 - 14:25	16	3	0	0
65	2023-09-25	stationary survey	Rice Lake (WB06)	BR, RF	15:16 - 16:16	22	2	10	0
66	2023-09-26	canoe survey	Teardrop Lake (WB01)	BR, RF	09:25 - 10:00	13	0	0	0
67	2023-09-27	boat survey	Dixie Creek	BR, RF	09:30 - 10:20	14	0	0	0
68	2023-09-27	stationary survey	Rice Lake (WB06)	BR, RF	08:35 - 09:35	14	2	100	0
69	2023-09-28	canoe survey	Teardrop Lake (WB01)	BR, RF	15:10 - 15:25	17	2	100	0

*AH=Al Harris, AS=Ashley Spenceley; AF=Angus Foster, BM=Brady Mills, BR=Brian Ratcliff, DB=Darryl Boyd, EM=Emily Meek, EW=Eric Watson, FF=Fergus Foster, LS=Lindsay Spenceley, NB=Nate Benoit, LG=Luke Giroux, RF=Rob Foster

Appendix 16. Summary of turtle surveys, 2022-2023.

Location	Survey Type	Date	Survey Time	Duration (hr:min)	Observer	Air Temp. (°C)	Wind (Beauf.)	Cloud (%)	Precip.
Dixie Creek from bridge west to Dixie Lake	canoe	2022-07-03	08:00 - 11:30	3:30	AS/AF	23	1	40	0
Dixie Creek from bridge west to Dixie Lake	canoe	2022-07-06	10:30 - 13:30	3:00	AS/NB	24	1	50	0
Waterbody WB02	foot	2022-07-05	18:50 - 19:05	0:15	AS/NB	26	2	30	0
Waterbody WB02	foot	2022-06-07	16:00 - 16:30	0:30	RF	21	0	0	0
Waterbody WB02	foot	2022-06-09	09:30 - 10:15	0:45	RF	17	3	0	0
Waterbody WB02	foot	2022-06-09	12:15 - 12:30	0:15	RF	17	0	100	0
Waterbody WB02	foot	2022-07-01	09:20 - 10:20	1:00	RF/LS	18	1	10	0
Dixie Creek from Tote Rd bridge to riffle near Trib 03 mouth	boat	2022-06-10	05:40 - 10:25	4:45	RF, EW	6-14	0-1	0-100	0
Dixie Creek from Tote Rd bridge to riffle near Trib 03 mouth	boat	2022-07-01	05:45 - 11:20	5:45	RF, AF	15-16	0	0	0
Dixie Creek from Tote Rd bridge to riffle near Trib 03 mouth	boat	2023-06-09	05:45 - 11:20	5:45	RF, LG	15-16	0-1	0	0
Dixie Creek from Tote Rd bridge to riffle near Trib 03 mouth	boat	2023-07-07	06:00 - 12:15	6:15	RF, AF	15-18	0-1	90	0
Rice Lake (WB06)	boat	2023-06-11	05:45 - 09:30	3:45	RF, LG	6-12	0	0-100	0
Rice Lake (WB06)	boat	2023-07-08	08:30 - 10:30	2:00	LS, LG	17-21	0-1	10-20	0
Rice Lake (WB06) from Dixie Creek bridge on Tote Road	boat	2022-06-09	05:40 - 10:25	4:45	RF, EW	6-14	0-1	0-40	0
Rice Lake (WB06) from Dixie Creek bridge on Tote Road	boat	2022-07-02	05:40 - 10:30	4:50	BR, FF	9-17	1-2	0-50	0
Teardrop Lake (WB01) & WB02	foot	2023-06-02	15:00 - 16:35	1:30	LG, BM	26	2	20	0
Teardrop Lake (WB01) & WB02	foot	2023-06-05	15:15- 17:15	2:00	LG, BM	22	3	30	0
Waterbody WB07	foot	2023-07-06	14:45 - 15:55	1:10	LG, BM	18	2-3	0	0

*AS=Ashley Spenceley; AF=Angus Foster, BM=Brady Mills, BR=Brian Ratcliff, EW=Eric Watson, FF=Fergus Foster, LS=Lindsay Spenceley, NB=Nate Benoit, LG=Luke Giroux, RF=Rob Foster

Appendix 17. Teardrop Lake Wetland Evaluation Report.

Teardrop Lake
Wetland Evaluation R

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Appendix 18. Rice Lake Wetland Evaluation Report.

Rice Lake Wetland
Evaluation Report 202

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Appendix 19. Vascular Plant Species of the Great Bear Resources AOI.

The following species were observed in the Great Bear Resources (GBR) AOI in 2021-2023. Nomenclature and subnational ranks (S-ranks) are by NHIC (2024).

List is alphabetically by family and scientific name.

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Acoraceae	*Acorus americanus*	American Sweetflag	S4		8	-5
Alismataceae	*Alisma triviale*	Northern Water-plantain	S5		1	-5
Alismataceae	*Sagittaria cuneata*	Northern Arrowhead	S5		7	-5
Alismataceae	*Sagittaria latifolia*	Broad-leaved Arrowhead	S5		4	-5
Amaranthaceae	*Chenopodium album*	Common Lamb's-quarters	SNA	SE5		3
Apiaceae	*Cicuta bulbifera*	Bulbous Water-hemlock	S5		5	-5
Apiaceae	*Cicuta maculata*	Spotted Water-hemlock	S5		6	-5
Apiaceae	*Sium suave*	Common Water-parsnip	S5		4	-5
Apocynaceae	*Apocynum androsaemifolium*	Spreading Dogbane	S5		3	5
Araceae	*Calla palustris*	Wild Calla	S5		8	-5
Araceae	*Lemna minor*	Small Duckweed	S5		5	-5
Araceae	*Spirodela polyrhiza*	Great Duckweed	S5		4	-5
Araliaceae	*Aralia hispida*	Bristly Sarsaparilla	S5		8	5
Araliaceae	*Aralia nudicaulis*	Wild Sarsaparilla	S5		4	3
Aristolochiaceae	*Asarum canadense*	Canada Wild-ginger	S5		6	5
Asparagaceae	*Maianthemum canadense*	Wild Lily-of-the-valley	S5		5	3
Asparagaceae	*Maianthemum stellatum*	Star-flowered False Solomon's Seal	S5		6	0
Asparagaceae	*Maianthemum trifolium*	Three-leaved False Solomon's Seal	S5		10	-5
Asteraceae	*Achillea millefolium*	Common Yarrow	SNA	SE5?		3
Asteraceae	*Anaphalis margaritacea*	Pearly Everlasting	S5		3	3
Asteraceae	*Antennaria neglecta*	Field Pussytoes	S5		3	5
Asteraceae	*Bidens beckii*	Water Beggarticks	S5		8	-5
Asteraceae	*Bidens cernua*	Nodding Beggarticks	S5		2	-5
Asteraceae	*Bidens frondosa*	Devil's Beggarticks	S5		3	-3
Asteraceae	*Canadanthus modestus*	Great Northern Aster	S4S5		8	0
Asteraceae	*Cirsium arvense*	Canada Thistle	SNA	SE5		3
Asteraceae	*Cirsium muticum*	Swamp Thistle	S5		8	-5
Asteraceae	*Cirsium vulgare*	Bull Thistle	SNA	SE5		3
Asteraceae	*Crepis tectorum*	Narrow-leaved Hawksbeard	SNA	SE5		5
Asteraceae	*Doellingeria umbellata*	Flat-top White Aster	S5		6	-3
Asteraceae	*Erigeron canadensis*	Canada Horseweed	S5		0	3
Asteraceae	*Erigeron philadelphicus*	Philadelphia Fleabane	S5		1	-3
Asteraceae	*Erigeron strigosus*	Rough Fleabane	S5		4	3
Asteraceae	*Euthamia graminifolia*	Grass-leaved Goldenrod	S5		2	0
Asteraceae	*Eutrochium maculatum*	Spotted Joe Pye Weed	S5		3	-5
Asteraceae	*Gnaphalium uliginosum*	Low Cudweed	SNA	SE5		0
Asteraceae	*Lactuca biennis*	Tall Blue Lettuce	S5		6	0
Asteraceae	*Leucanthemum vulgare*	Oxeye Daisy	SNA	SE5		5
Asteraceae	*Petasites frigidus*	Arctic Sweet Coltsfoot	S5		8	-3
Asteraceae	*Pilosella aurantiaca*	Orange Hawkweed	SNA	SE5		5
Asteraceae	*Pilosella caespitosa*	Meadow Hawkweed	SNA	SE5		5
Asteraceae	*Pilosella piloselloides*	Tall Hawkweed	SNA	SE5		5

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Asteraceae	*Solidago canadensis*	Canada Goldenrod	S5		1	3
Asteraceae	*Solidago hispida*	Hairy Goldenrod	S5		7	5
Asteraceae	*Solidago nemoralis*	Grey-stemmed Goldenrod	S5		2	5
Asteraceae	*Solidago uliginosa*	Bog Goldenrod	S5		9	-5
Asteraceae	*Sonchus arvensis*	Field Sow-thistle	SNA	SE5		3
Asteraceae	*Sonchus oleraceus*	Common Sow-thistle	SNA	SE5		3
Asteraceae	*Symphyotrichum boreale*	Rush Aster	S5		10	-5
Asteraceae	*Symphyotrichum ciliolatum*	Lindley's Aster	S5		6	5
Asteraceae	*Symphyotrichum ericoides*	White Heath Aster	S5		4	3
Asteraceae	*Symphyotrichum lanceolatum*	Panicled Aster	S5		3	-3
Asteraceae	*Symphyotrichum puniceum*	Purple-stemmed Aster	S5		6	-5
Asteraceae	*Tanacetum vulgare*	Common Tansy	SNA	SE5		5
Asteraceae	*Taraxacum officinale*	Common Dandelion	SNA	SE5		3
Asteraceae	*Tragopogon dubius*	Yellow Goatsbeard	SNA	SE5		5
Balsaminaceae	*Impatiens capensis*	Spotted Jewelweed	S5		4	-3
Betulaceae	*Alnus alnobetula*	Green Alder	S5		8	0
Betulaceae	*Betula papyrifera*	Paper Birch	S5		2	3
Betulaceae	*Betula pumila*	Bog Birch	S5		9	-5
Betulaceae	*Corylus cornuta*	Beaked Hazelnut	S5		5	3
Boraginaceae	*Mertensia paniculata*	Tall Bluebells	S5			0
Brassicaceae	*Barbarea vulgaris*	Bitter Wintercress	SNA	SE5		0
Brassicaceae	*Cardamine pensylvanica*	Pennsylvania Bittercress	S5		6	-3
Cabombaceae	*Brasenia schreberi*	Watershield	S5		7	-5
Campanulaceae	*Campanula rapunculoides*	Creeping Bellflower	SNA	SE5		5
Caprifoliaceae	*Diervilla lonicera*	Northern Bush-honeysuckle	S5		5	5
Caprifoliaceae	*Linnaea borealis*	Twinflower	S5		7	0
Caprifoliaceae	*Lonicera canadensis*	Canada Fly Honeysuckle	S5		6	3
Caprifoliaceae	*Lonicera dioica*	Limber Honeysuckle	S5		5	3
Caprifoliaceae	*Lonicera hirsuta*	Hairy Honeysuckle	S5		7	0
Caprifoliaceae	*Lonicera oblongifolia*	Swamp Fly-honeysuckle	S5		8	-5
Caprifoliaceae	*Lonicera villosa*	Mountain Fly-honeysuckle	S5		10	-3
Caprifoliaceae	*Symphoricarpos occidentalis*	Western Snowberry	SNA	SE3		3
Caryophyllaceae	*Cerastium arvense*	Field Chickweed	S4		8	3
Caryophyllaceae	*Silene latifolia*	White Campion	SNA	SE5		5
Caryophyllaceae	*Silene vulgaris*	Bladder Campion	SNA	SE5		5
Cornaceae	*Cornus canadensis*	Bunchberry	S5		7	0
Cornaceae	*Cornus sericea*	Red-osier Dogwood	S5		2	-3
Cupressaceae	*Juniperus communis*	Common Juniper	S5		4	3
Cupressaceae	*Thuja occidentalis*	Eastern White Cedar	S5		4	-3
Cyperaceae	*Carex aquatilis*	Water Sedge	S5		7	-5
Cyperaceae	*Carex arcta*	Northern Clustered Sedge	S4S5		8	-5
Cyperaceae	*Carex arctata*	Drooping Woodland Sedge	S5		5	5
Cyperaceae	*Carex bebbii*	Bebb's Sedge	S5		3	-5
Cyperaceae	*Carex brunnescens*	Brownish Sedge	S5		6	-3
Cyperaceae	*Carex canescens*	Hoary Sedge	S5		7	-5
Cyperaceae	*Carex castanea*	Chestnut Sedge	S5		7	-3
Cyperaceae	*Carex chordorrhiza*	Creeping Sedge	S5		10	-5
Cyperaceae	*Carex cryptolepis*	Northeastern Sedge	S4		7	-5

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Cyperaceae	*Carex disperma*	Two-seeded Sedge	S5		8	-5
Cyperaceae	*Carex echinata*	Star Sedge	S5		7	-5
Cyperaceae	*Carex foenea*	Bronze Sedge	S5		3	5
Cyperaceae	*Carex gracillima*	Graceful Sedge	S5		4	3
Cyperaceae	*Carex houghtoniana*	Houghton's Sedge	S5		6	5
Cyperaceae	*Carex intumescens*	Bladder Sedge	S5		6	-3
Cyperaceae	*Carex lacustris*	Lake Sedge	S5		5	-5
Cyperaceae	*Carex lasiocarpa*	Woolly-fruit Sedge	S5		8	-5
Cyperaceae	*Carex leptalea*	Bristle-stalked Sedge	S5		8	-5
Cyperaceae	*Carex limosa*	Mud Sedge	S5		10	-5
Cyperaceae	*Carex magellanica*	Boreal Bog Sedge	S5		10	-5
Cyperaceae	*Carex oligosperma*	Few-seeded Sedge	S5		10	-5
Cyperaceae	*Carex pauciflora*	Few-flowered Sedge	S5		10	-5
Cyperaceae	*Carex pensylvanica*	Pennsylvania Sedge	S5		5	5
Cyperaceae	*Carex pseudocyperus*	Cyperus-like Sedge	S5		6	-5
Cyperaceae	*Carex retrorsa*	Retrorse Sedge	S5		5	-5
Cyperaceae	*Carex stipata*	Awl-fruited Sedge	S5		3	-5
Cyperaceae	*Carex trisperma*	Three-seeded Sedge	S5		9	-5
Cyperaceae	*Carex utriculata*	Northern Beaked Sedge	S5		7	-5
Cyperaceae	*Carex vaginata*	Sheathed Sedge	S5		10	-5
Cyperaceae	*Dulichium arundinaceum*	Three-way Sedge	S5		7	-5
Cyperaceae	*Eleocharis acicularis*	Needle Spikerush	S5		5	-5
Cyperaceae	*Eleocharis palustris*	Creeping Spikerush	S5		6	-5
Cyperaceae	*Eriophorum angustifolium*	Narrow-leaved Cottongrass	S5		9	-5
Cyperaceae	*Eriophorum vaginatum*	Tussock Cottongrass	S5		10	-5
Cyperaceae	*Rhynchospora alba*	White Beakrush	S5		10	-5
Cyperaceae	*Rhynchospora fusca*	Brown Beakrush	S4		10	-5
Cyperaceae	*Schoenoplectus acutus*	Hard-stemmed Bulush	S5		5	-5
Cyperaceae	*Schoenoplectus pungens*	Common Three-square Bulrush	S5		6	-5
Cyperaceae	*Scirpus cyperinus*	Common Woolly Bulrush	S5		4	-5
Cyperaceae	*Trichophorum cespitosum*	Tufted Clubrush	S5		10	-5
Cystopteridaceae	*Cystopteris fragilis*	Fragile Fern	S4		7	3
Cystopteridaceae	*Gymnocarpium dryopteris*	Common Oak Fern	S5		7	3
Dennstaedtiaceae	*Pteridium aquilinum*	Bracken Fern	S5		2	3
Droseraceae	*Drosera rotundifolia*	Round-leaved Sundew	S5		7	-5
Dryopteridaceae	*Dryopteris carthusiana*	Spinulose Wood Fern	S5		5	-3
Dryopteridaceae	*Dryopteris cristata*	Crested Wood Fern	S5		7	-5
Dryopteridaceae	*Dryopteris fragrans*	Fragrant Wood Fern	S4		10	5
Equisetaceae	*Equisetum arvense*	Field Horsetail	S5		0	0
Equisetaceae	*Equisetum fluviatile*	Water Horsetail	S5		7	-5
Equisetaceae	*Equisetum palustre*	Marsh Horsetail	S5		10	-3
Equisetaceae	*Equisetum pratense*	Meadow Horsetail	S5		8	-3
Equisetaceae	*Equisetum sylvaticum*	Woodland Horsetail	S5		7	-3
Ericaceae	*Andromeda polifolia*	Bog Rosemary	S5		10	-5
Ericaceae	*Arctostaphylos uva-ursi*	Common Bearberry	S5		8	5
Ericaceae	*Chamaedaphne calyculata*	Leatherleaf	S5		9	-5
Ericaceae	*Chimaphila umbellata*	Common Pipsissewa	S5		8	5
Ericaceae	*Gaultheria hispidula*	Creeping Snowberry	S5		8	-3

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Ericaceae	*Kalmia polifolia*	Pale Bog Laurel	S5		10	-5
Ericaceae	*Moneses uniflora*	One-flowered Wintergreen	S5		10	0
Ericaceae	*Monotropa uniflora*	Indian-pipe	S5		6	3
Ericaceae	*Orthilia secunda*	One-sided Wintergreen	S5		5	0
Ericaceae	*Pyrola asarifolia*	Pink Pyrola	S5		7	-3
Ericaceae	*Pyrola chlorantha*	Green-flowered Pyrola	S4S5		6	3
Ericaceae	*Rhododendron groenlandicum*	Common Labrador Tea	S5		9	-5
Ericaceae	*Vaccinium angustifolium*	Early Lowbush Blueberry	S5		6	3
Ericaceae	*Vaccinium myrtilloides*	Velvet-leaved Blueberry	S5		7	-3
Ericaceae	*Vaccinium oxycoccos*	Small Cranberry	S5		10	-5
Ericaceae	*Vaccinium vitis-idaea*	Mountain Cranberry	S5		7	0
Fabaceae	*Lathyrus ochroleucus*	Cream-colored Vetchling	S4S5		8	5
Fabaceae	*Melilotus albus*	White Sweet-clover	SNA	SE5		3
Fabaceae	*Trifolium aureum*	Yellow Clover	SNA	SE5		5
Fabaceae	*Trifolium hybridum*	Alsike Clover	SNA	SE5		3
Fabaceae	*Trifolium pratense*	Red Clover	SNA	SE5		3
Fabaceae	*Trifolium repens*	White Clover	SNA	SE5		3
Fabaceae	*Vicia americana*	American Vetch	S5		5	3
Fabaceae	*Vicia cracca*	Tufted Vetch	SNA	SE5		5
Geraniaceae	*Geranium bicknellii*	Bicknell's Geranium	S5		5	5
Grossulariaceae	*Ribes americanum*	American Black Currant	S5		4	-3
Grossulariaceae	*Ribes glandulosum*	Skunk Currant	S5		6	-3
Grossulariaceae	*Ribes lacustre*	Bristly Black Currant	S5		7	-3
Grossulariaceae	*Ribes oxyacanthoides*	Canada Gooseberry	S5			3
Grossulariaceae	*Ribes triste*	Swamp Red Currant	S5		6	-5
Haloragaceae	*Myriophyllum farwellii*	Farwell's Water-milfoil	S4		8	-5
Haloragaceae	*Myriophyllum verticillatum*	Whorled Water-milfoil	S5		7	-5
Hydrocharitaceae	*Elodea canadensis*	Canada Waterweed	S5		4	-5
Hydrocharitaceae	*Vallisneria americana*	American Eelgrass	S5		6	-5
Iridaceae	*Iris versicolor*	Harlequin Blue Flag	S5		5	-5
Juncaceae	*Juncus balticus*	Baltic Rush	S5		5	-5
Juncaceae	*Juncus nodosus*	Knotted Rush	S5		5	-5
Juncaceae	*Luzula acuminata*	Hairy Woodrush	S5		6	3
Juncaginaceae	*Triglochin maritima*	Seaside Arrowgrass	S5		8	-5
Lamiaceae	*Galeopsis tetrahit*	Common Hemp-nettle	SNA	SE		3
Lamiaceae	*Lycopus uniflorus*	Northern Water-horehound	S5		5	-5
Lamiaceae	*Mentha canadensis*	Canada Mint	S5		3	-3
Lamiaceae	*Prunella vulgaris*	Common Self-heal	S5		0	0
Lamiaceae	*Scutellaria lateriflora*	Mad-dog Skullcap	S5		5	-5
Lamiaceae	*Stachys hispida*	Hispid Hedge-nettle	S4		7	-3
Lamiaceae	*Stachys palustris*	Marsh Hedge-nettle	SNA	SE5		-5
Lentibulariaceae	*Utricularia intermedia*	Flat-leaved Bladderwort	S5		8	-5
Lentibulariaceae	*Utricularia vulgaris ssp. macrorhiza*	Greater Bladderwort	S5		4	-5
Liliaceae	*Clintonia borealis*	Yellow Clintonia	S5		7	0
Liliaceae	*Lilium philadelphicum*	Wood Lily	S5		8	0
Liliaceae	*Streptopus lanceolatus*	Rose Twisted-stalk	S5		7	3
Lycopodiaceae	*Dendrolycopodium dendroideum*	Round-branched Tree-clubmoss	S5		7	3
Lycopodiaceae	*Dendrolycopodium obscurum*	Flat-branched Tree-clubmoss	S4		6	3

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Lycopodiaceae	*Diphasiastrum complanatum*	Northern Ground-cedar	S5		5	3
Lycopodiaceae	*Lycopodiella inundata*	Northern Bog Clubmoss	S5		7	-5
Lycopodiaceae	*Lycopodium clavatum*	Running Clubmoss	S5		6	0
Lycopodiaceae	*Spinulum annotinum*	Stiff Clubmoss	S5		6	0
Melanthiaceae	*Trillium cernuum*	Nodding Trillium	S5		8	0
Menyanthaceae	*Menyanthes trifoliata*	Bog Buckbean	S5		9	-5
Molluginaceae	*Mollugo verticillata*	Green Carpetweed	SNA	SE5		0
Myricaceae	*Myrica gale*	Sweet Gale	S5		6	-5
Nymphaeaceae	*Nuphar variegata*	Variegated Pond-lily	S5		7	-5
Nymphaeaceae	*Nymphaea leibergii*	Dwarf Water-lily	S4?		10	-5
Oleaceae	*Fraxinus nigra*	Black Ash	S4		7	-3
Onagraceae	*Chamaenerion angustifolium*	Fireweed	S5		3	0
Onagraceae	*Circaea alpina*	Small Enchanter's Nightshade	S5		6	-3
Onagraceae	*Epilobium ciliatum*	Northern Willowherb	S5		3	-3
Onagraceae	*Epilobium leptophyllum*	Narrow-leaved Willowherb	S5		7	-5
Onagraceae	*Epilobium palustre*	Marsh Willowherb	S5		10	-5
Onagraceae	*Oenothera biennis*	Common Evening-primrose	S5		0	3
Onocleaceae	*Matteuccia struthiopteris*	Ostrich Fern	S5		5	0
Onocleaceae	*Onoclea sensibilis*	Sensitive Fern	S5		4	-3
Ophioglossaceae	*Botrypus virginianus*	Rattlesnake Fern	S5		5	3
Orchidaceae	*Corallorhiza maculata*	Spotted Coralroot	S5		7	3
Orchidaceae	*Corallorhiza trifida*	Early Coralroot	S5		7	-3
Orchidaceae	*Cypripedium acaule*	Pink Lady's-slipper	S5		7	-3
Orchidaceae	*Cypripedium parviflorum*	Yellow Lady's-slipper	S5		5	0
Orchidaceae	*Goodyera repens*	Dwarf Rattlesnake-plantain	S5		8	0
Orchidaceae	*Goodyera tesselata*	Checkered Rattlesnake-plantain	S5		7	3
Orchidaceae	*Platanthera dilatata*	Tall White Bog Orchid	S5		10	-3
Orchidaceae	*Platanthera hookeri*	Hooker's Orchid	S3		8	0
Orchidaceae	*Platanthera huronensis*	Lake Huron Green Orchid	SU		5	-3
Orchidaceae	*Platanthera orbiculata*	Lesser Round-leaved Orchid	S4		9	0
Orchidaceae	*Spiranthes lacera*	Slender Ladies'-tresses	S4S5		8	0
Orobanchaceae	*Melampyrum lineare*	American Cow-wheat	S5		6	3
Orobanchaceae	*Rhinanthus minor*	Little Yellow Rattle	SU			0
Papaveraceae	*Capnoides sempervirens*	Pale Corydalis	S5		7	5
Phrymaceae	*Mimulus ringens*	Square-stemmed Monkeyflower	S5		6	-5
Pinaceae	*Abies balsamea*	Balsam Fir	S5		5	-3
Pinaceae	*Larix laricina*	Tamarack	S5		7	-3
Pinaceae	*Picea glauca*	White Spruce	S5		6	3
Pinaceae	*Picea mariana*	Black Spruce	S5		8	-3
Pinaceae	*Pinus banksiana*	Jack Pine	S5		5	3
Plantaginaceae	*Callitriche palustris*	Spring Water-starwort	S5		6	-5
Plantaginaceae	*Gratiola neglecta*	Clammy Hedge-hyssop	S4		7	-5
Plantaginaceae	*Hippuris vulgaris*	Common Mare's-tail	S5		10	-5
Plantaginaceae	*Plantago major*	Common Plantain	SNA	SE5		3
Poaceae	*Agrostis scabra*	Rough Bentgrass	S5		6	0
Poaceae	*Alopecurus pratensis*	Meadow Foxtail	SNA	SE5		-3
Poaceae	*Beckmannia syzigachne*	American Sloughgrass	S4		4	-5
Poaceae	*Bromus ciliatus*	Fringed Brome	S5		6	-3

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Poaceae	*Bromus inermis*	Smooth Brome	SNA	SE5		5
Poaceae	*Calamagrostis canadensis*	Bluejoint Reedgrass	S5		4	-5
Poaceae	*Deschampsia cespitosa*	Tufted Hairgrass	S5		9	-3
Poaceae	*Elymus repens*	Quackgrass	SNA	SE5		3
Poaceae	*Glyceria borealis*	Boreal Mannagrass	S5		8	-5
Poaceae	*Glyceria canadensis*	Canada Mannagrass	S5		7	-5
Poaceae	*Hordeum jubatum*	Foxtail Barley	S5?		0	0
Poaceae	*Lolium perenne*	Perennial Ryegrass	SNA	SE4		3
Poaceae	*Oryzopsis asperifolia*	Rough-leaved Mountain Rice	S5		6	5
Poaceae	*Phleum pratense*	Common Timothy	SNA	SE5		3
Poaceae	*Phragmites australis*	Common Reed	SU		0	-3
Poaceae	*Poa palustris*	Fowl Bluegrass	S5		5	-3
Poaceae	*Poa pratensis*	Kentucky Bluegrass	S5		0	3
Poaceae	*Schizachne purpurascens*	Purple False Melic	S5		6	3
Poaceae	*Zizania palustris*	Northern Wildrice	S5?		9	-5
Polygalaceae	*Polygaloides paucifolia*	Fringed Milkwort	S5		6	3
Polygonaceae	*Fallopia cilinodis*	Fringed Black Bindweed	S5		2	5
Polygonaceae	*Persicaria amphibia*	Water Smartweed	S5		5	-5
Polygonaceae	*Persicaria maculosa*	Spotted Lady's-thumb	SNA	SE5		-3
Polygonaceae	*Persicaria punctata*	Dotted Smartweed	S5		4	-5
Polygonaceae	*Rumex acetosella*	Sheep Sorrel	SNA	SE5		3
Polygonaceae	*Rumex britannica*	Greater Water Dock	S5		6	-5
Polypodiaceae	*Polypodium virginianum*	Rock Polypody	S5		7	5
Potamogetonaceae	*Potamogeton epihydrus*	Ribbon-leaved Pondweed	S5		5	-5
Potamogetonaceae	*Potamogeton gramineus*	Grass-leaved Pondweed	S5		4	-5
Potamogetonaceae	*Potamogeton natans*	Floating-leaved Pondweed	S5		5	-5
Potamogetonaceae	*Potamogeton nodosus*	Long-leaved Pondweed	S5		7	-5
Potamogetonaceae	*Potamogeton praelongus*	White-stemmed Pondweed	S4		7	-5
Potamogetonaceae	*Potamogeton richardsonii*	Richardson's Pondweed	S5		5	-5
Potamogetonaceae	*Potamogeton zosteriformis*	Flat-stemmed Pondweed	S5		5	-5
Primulaceae	*Lysimachia borealis*	Northern Starflower	S5		6	0
Primulaceae	*Lysimachia terrestris*	Swamp Yellow Loosestrife	S5		6	-5
Primulaceae	*Lysimachia thyrsiflora*	Tufted Yellow Loosestrife	S5		7	-5
Ranunculaceae	*Actaea rubra*	Red Baneberry	S5		6	3
Ranunculaceae	*Anemonastrum canadense*	Canada Anemone	S5		3	-3
Ranunculaceae	*Aquilegia canadensis*	Red Columbine	S5		5	3
Ranunculaceae	*Caltha natans*	Floating Marsh Marigold	S2			-5
Ranunculaceae	*Caltha palustris*	Yellow Marsh Marigold	S5		5	-5
Ranunculaceae	*Coptis trifolia*	Goldthread	S5		7	-3
Ranunculaceae	*Ranunculus acris*	Common Buttercup	SNA	SE5		0
Ranunculaceae	*Ranunculus repens*	Creeping Buttercup	SNA	SE5		0
Ranunculaceae	*Thalictrum dioicum*	Early Meadow-rue	S5		6	3
Ranunculaceae	*Thalictrum pubescens*	Tall Meadow-rue	S5		5	-3
Rosaceae	*Amelanchier alnifolia*	Saskatoon	S4?		8	3
Rosaceae	*Amelanchier bartramiana*	Bartram's Serviceberry	S5		8	0
Rosaceae	*Comarum palustre*	Marsh Cinquefoil	S5		7	-5
Rosaceae	*Dasiphora fruticosa*	Shrubby Cinquefoil	S5		8	-3
Rosaceae	*Fragaria virginiana*	Wild Strawberry	S5		2	3

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Rosaceae	*Potentilla norvegica*	Rough Cinquefoil	S5		0	0
Rosaceae	*Prunus pensylvanica*	Pin Cherry	S5		3	3
Rosaceae	*Prunus virginiana*	Chokecherry	S5		2	3
Rosaceae	*Rosa acicularis*	Prickly Rose	S5		5	3
Rosaceae	*Rubus chamaemorus*	Cloudberry	S5			-3
Rosaceae	*Rubus idaeus*	Red Raspberry	S5		2	3
Rosaceae	*Rubus pubescens*	Dwarf Raspberry	S5		4	-3
Rosaceae	*Sibbaldia tridentata*	Three-toothed Cinquefoil	S5		10	3
Rosaceae	*Sorbus decora*	Showy Mountain-ash	S5		8	3
Rosaceae	*Spiraea alba*	White Meadowsweet	S5		3	-3
Rubiaceae	*Galium asprellum*	Rough Bedstraw	S5		6	-5
Rubiaceae	*Galium boreale*	Northern Bedstraw	S5		7	0
Rubiaceae	*Galium palustre*	Common Marsh Bedstraw	S5		5	-5
Rubiaceae	*Galium trifidum*	Three-petalled Bedstraw	S5		5	-3
Rubiaceae	*Galium triflorum*	Three-flowered Bedstraw	S5		4	3
Salicaceae	*Populus balsamifera*	Balsam Poplar	S5		4	-3
Salicaceae	*Populus tremuloides*	Trembling Aspen	S5		2	0
Salicaceae	*Salix bebbiana*	Bebb's Willow	S5		4	-3
Salicaceae	*Salix candida*	Sage Willow	S5		10	-5
Salicaceae	*Salix discolor*	Pussy Willow	S5		3	-3
Salicaceae	*Salix pedicellaris*	Bog Willow	S5		9	-5
Salicaceae	*Salix petiolaris*	Meadow Willow	S5		3	-3
Salicaceae	*Salix pyrifolia*	Balsam Willow	S5		10	-3
Santalaceae	*Arceuthobium pusillum*	Eastern Dwarf Mistletoe	S5		10	0
Santalaceae	*Geocaulon lividum*	Northern Comandra	S5		9	0
Sapindaceae	*Acer spicatum*	Mountain Maple	S5		6	3
Sarraceniaceae	*Sarracenia purpurea*	Northern Pitcher Plant	S5		10	-5
Saxifragaceae	*Mitella nuda*	Naked Mitrewort	S5		6	-3
Scheuchzeriaceae	*Scheuchzeria palustris*	Marsh Scheuchzeria	S5		10	-5
Scrophulariaceae	*Verbascum thapsus*	Common Mullein	SNA	SE5		5
Taxaceae	*Taxus canadensis*	Canada Yew	S4		7	3
Thelypteridaceae	*Phegopteris connectilis*	Northern Beech Fern	S5		8	3
Thelypteridaceae	*Thelypteris palustris*	Marsh Fern	S5		5	-3
Typhaceae	*Sparganium angustifolium*	Narrow-leaved Burreed	S4?		9	-5
Typhaceae	*Sparganium fluctuans*	Floating Burreed	S5?		9	-5
Typhaceae	*Typha angustifolia*	Narrow-leaved Cattail	SNA	SE5		-5
Typhaceae	*Typha latifolia*	Broad-leaved Cattail	S5		1	-5
Ulmaceae	*Ulmus americana*	White Elm	S5		3	-3
Urticaceae	*Urtica dioica*	Stinging Nettle	SNA	SE2		0
Viburnaceae	*Sambucus racemosa*	Red Elderberry	S5		5	3
Viburnaceae	*Viburnum edule*	Squashberry	S5		8	-3
Viburnaceae	*Viburnum opulus*	Cranberry Viburnum	S5		5	-3
Viburnaceae	*Viburnum rafinesqueanum*	Downy Arrowwood	S5		7	5
Violaceae	*Viola adunca*	Hooked Violet	S5?		5	3
Violaceae	*Viola blanda*	Sweet White Violet	S5		6	-3
Violaceae	*Viola pubescens*	Yellow Violet	S5		5	3
Violaceae	*Viola renifolia*	Kidney-leaved Violet	S5		7	-3
Violaceae	*Viola sororia*	Woolly Blue Violet	S5		4	0

Family	Scientific Name	Common Name	S-Rank	Exotic Status	Coeff. of Cons.[1]	Coeff. of Wetness[2]
Woodsiaceae	*Woodsia ilvensis*	Rusty Woodsia	S5		8	5

1 coefficient of conservatism is an index for native species based on its degree of fidelity to a range of synecological parameters in Ontario, ranging from 0 to those found in a wide range of habitats, including disturbed ones to 10 for species with narrow range of suitable habitats.

2 coefficient of wetness is an index with ranging from -5 for an obligate wetland species to 5 for an obligate upland species in Ontario

Appendix 20. Results of wild rice surveys on Teardrop Lake (WB01), August 22, 2022.

Plot #	WP	Easting	Northing	Water Depth (m)	# Stems wild rice	% Cover wild rice	% Cover NUPHVAR	% Cover NYMPTET	% Cover POTAEPI	% Cover SAGICUN	% Cover SPARFLU
1	341	454215	5635059	46	20	20	0	0	0	0	0
2	343	454201	5635075	50	15	15	0	5	0	0	0
3	345	454161	5635238	51	16	20	0	0	0	0	0
4	346	454196	5635301	52	8	4	0	0	3	0	0
5	347	454242	5635341	51	25	50	0	0	0	0.1	0
6	348	454185	5635435	42	15	15	0	0	0	0	10
7	349	454137	5635464	45	77	70	0	0	0	0	0
8	350	454085	5635491	34	76	30	0	0	0	1	2
9	365	454059	5635432	44	59	35	0	0	0	0	0
10	366	454030	5635329	66	23	15	0.1	0	0	0.1	0
11	367	454012	5635268	48	35	20	0	0	0	0	0
12	368	454074	5635250	50	9	4	0	0	0	0	0
13	370	454075	5635173	49	37	30	0	0	0	0	0
14	371	454114	5635147	56	16	10	0	0	0	0	0
15	372	454197	5635122	54	36	35	0	0.1	0	0.1	0.1

Appendix 21. Results of wild rice surveys on Rice Lake (WB06), Teardrop Lake (WB01), and adjacent creek, September 6-7, 2023.

Waterbody	Quadrat	Easting	Northing	# of Stems	Stem Height (cm)	Water Depth (cm)	pH	Conductivity (uS/sec)	Dissolved Oxygen (ppm)
WB06	1	461906	5633023	0	83	92	7.46	98	8.02
WB06	2	461893	5632979	17	83	98			
WB06	3	461908	5632850	76	135	85			
WB06	4	461880	5632801	43	130	86			
WB06	5	461793	5632814	65	135	90			
WB06	6	461787	5632824	56	140	94			
WB06	7	461751	5632865	59	125	100			
WB06	8	461719	5632911	10	80	106			
WB06	9	461692	5632935	3	85	103			
WB06	10	461821	5632954	40	70	99	7.74	99	6.8
WB06	11	461855	5632886	22	145	90			
WB06	12	462012	5632869	53	133	78			
WB06	13	461624	5632886	1	110	105			
WB06	14	461673	5632858	28	90	107			
WB06	15	461641	5632797	44	105	93			
WB06	16	461616	5632812	30	128	100			
WB06	17	461542	5632793	23	105	89			
WB06	18	461546	5632846	25	99	106			
WB06	19	461567	5632915	0		107			
WB06	20	461425	5632791	54	135	100	8.05	99	7.48
WB06	21	460316	5633009	12	128	66			
WB06	22	460054	5633267	9	72	103			
WB06	23	460041	5633231	7	85	89			
WB06	24	459982	5633292	31	122	94			
WB06	25	459905	5633365	54	114	104			
WB06	26	459863	5633423	28	114	99			
WB06	27	459905	5633445	31	79	106			
WB06	28	459872	5633464	24	102	107			
WB06	29	459833	5633517	36	117	92			
WB06	30	459797	5633540	92	112	76	7.78	99	5.34
WB06	31	459791	5633566	81	158	65			
WB06	32	459808	5633604	118	142	86			
WB06	33	459826	5633612	91	138	86			
WB06	34	459831	5633694	55	118	85			
WB06	35	459961	5633723	21	105	90			
WB06	36	459882	5633713	36	87	94			
WB06	37	459903	5633652	31	110	100			
WB06	38	459905	5633479	9	85	105			
WB06	39	460043	5633747	6	77	113			
WB06	40	459960	5633472	3	86	119	7.86	39	8.34
WB06	41	459891	5633488	26	100	112			
WB06	42	459917	5633513	53	94	111			

Waterbody	Quadrat	Easting	Northing	# of Stems	Stem Height (cm)	Water Depth (cm)	pH	Conductivity (uS/sec)	Dissolved Oxygen (ppm)
WB06	43	459932	5633544	41	113	110			
WB06	44	462015	5633093	7	75	111			
WB06	45	462045	5633066	0		95			
WB06	46	461969	5633027	0		94			
WB06	47	461857	5632992	37	94	90			
WB06	48	461744	5632885	0	77	100			
WB06	49	459808	5633604	19	102	98			
WB06	50	459826	5633612	33	108	101	8.02	98	7.89
WB01	1	454195	5635097	15	56	28	7.49	42	7.32
WB01	2	454181	5635079	58	68	25			
WB01	3	454142	5635122	7	65	23			
WB01	4	454138	5635165	17	83	29			
WB01	5	454146	5635171	17	89	33			
WB01	6	454060	5635166	1	75	21			
WB01	7	454050	5635189	3	67	24			
WB01	8	454026	5635229	7	85	39			
WB01	9	454027	5635259	12	65	30			
WB01	10	453979	5635304	31	76	16	7.29	26	2.92
WB01	11	453972	5635288	22	92	18			
WB01	12	453980	5635319	8	56	30			
WB01	13	453984	5635388	3	25	21			
WB01	14	453993	5635389	4	66	19			
WB01	15	454002	5635409	30	86	23			
WB01	16	454025	5635387	18	71	32			
WB01	17	454066	5635407	35	74	35			
WB01	18	454031	5635450	26	105	22			
WB01	19	454015	5635456	85	82	18			
WB01	20	454117	5635464	18	64	27	7.2	40	4.4
WB01	21	454064	5635468	35	80	25			
WB01	22	454076	5635477	29	90	21			
WB01	23	454092	5635468	0	102	26			
WB01	24	454095	5635431	47	90	39			
WB01	25	461809	5632952	12	82	24			
WB01	26	454142	5635473	48	100	25			
WB01	27	454196	5635449	16	95	26			
WB01	28	454216	5635368	23	71	34			
WB01	29	454245	5635361	11	70	39			
WB01	30	454236	5635317	30	50	36	7.14	44	6.32
WB01	31	454240	5635310	37	65	28			
WB01	32	454254	5635293	22	40	31			
WB01	33	454258	5635229	14	58	30			
WB01	34	454226	5635213	13	79	32			
WB01	35	454232	5635189	9	55	29			
WB01	36	454247	5635190	3	70	27			
WB01	37	454240	5635155	18	48	27			

Waterbody	Quadrat	Easting	Northing	# of Stems	Stem Height (cm)	Water Depth (cm)	pH	Conductivity (uS/sec)	Dissolved Oxygen (ppm)
WB01	38	454209	5635145	13	63	32			
WB01	39	454211	5635051	79	78	16			
WB01	40	454224	5635102	55	85	14	7.23	41	6.67
WB01	41	454191	5635133	18	70	29			
WB01	42	454193	5635186	5	60	31			
WB01	43	454177	5635234	14	82	34			
WB01	44	454158	5635273	21	87	37			
WB01	45	454165	5635342	8	87	36			
WB01	46	454140	5635319	24	59	37			
WB01	47	454134	5635312	19	82	35			
WB01	48	454109	5635315	31	79	33			
WB01	49	454126	5635289	20	77	33			
WB01	50	462018	5632822	0	64	35	7.14	53	5.39
WB01 Creek	1	454226	5634932	88	106	38			
WB01 Creek	2	454222	5634942	68	110	27			
WB01 Creek	3	454208	5634971	72	115	28			
WB01 Creek	4	454204	5634980	84	105	22			
WB01 Creek	5	454230	5634909	51	120	25			

Appendix 22. Fungi documented for the GBR AOI, 2021-2023. Listed alphabetically by scientific name.

Phylum	Class	Order	Family	Scientific Name	Common Name
Basidiomycota	Agaricomycetes	Agaricales		*Agaricales*	Common Gilled Mushrooms and Allies
Basidiomycota	Agaricomycetes	Agaricales		*Agaricineae*	
Basidiomycota	Agaricomycetes			*Agaricomycetes*	mushrooms, bracket fungi, puffballs, and allies
Ascomycota	Pezizomycetes	Pezizales	Pyronemataceae	*Aleuria aurantia*	orange peel fungus
Basidiomycota	Agaricomycetes	Agaricales	Amanitaceae	*Amanita*	amanita mushrooms
Basidiomycota	Agaricomycetes	Agaricales	Amanitaceae	*Amanita muscaria*	Fly Agaric
Basidiomycota	Agaricomycetes	Russulales	Auriscalpiaceae	*Artomyces pyxidatus*	crown-tipped coral fungus
Basidiomycota				*Basidiomycota*	Basidiomycete Fungi
Basidiomycota	Agaricomycetes	Boletales	Boletaceae	*Boletaceae*	boletes
Basidiomycota	Agaricomycetes	Boletales		*Boletales*	boletes and allies
Ascomycota	Pezizomycetes	Pezizales	Caloscyphaceae	*Caloscypha fulgens*	Spring Orange Peel Fungus
Basidiomycota	Agaricomycetes	Cantharellales	Hydnaceae	*Cantharellus*	chanterelles
Basidiomycota	Agaricomycetes	Cantharellales	Hydnaceae	*Cantharellus cibarius*	Golden Chanterelle
Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	*Cerioporus*	
Basidiomycota	Agaricomycetes	Polyporales	Cerrenaceae	*Cerrena unicolor*	Mossy Maze Polypore
Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	*Cladonia*	pixie cup and reindeer lichens
Ascomycota	Sordariomycetes	Hypocreales	Clavicipitaceae	*Claviceps zizaniae*	wildrice ergot
Basidiomycota	Agaricomycetes	Agaricales	Clitocybaceae	*Collybia*	
Basidiomycota	Agaricomycetes	Agaricales	Clitocybaceae	*Collybia tuberosa*	Lentil Shanklet
Basidiomycota	Agaricomycetes	Hymenochaetales	Coltriciaceae	*Coltricia*	
Basidiomycota	Agaricomycetes	Hymenochaetales	Coltriciaceae	*Coltricia cinnamomea*	Shiny cinnamon polypore
Basidiomycota	Agaricomycetes	Agaricales	Psathyrellaceae	*Coprinopsis atramentaria*	Common Ink Cap
Basidiomycota	Agaricomycetes	Agaricales	Cortinariaceae	*Cortinariaceae*	
Basidiomycota	Agaricomycetes	Agaricales	Cortinariaceae	*Cortinarius*	Webcaps
Basidiomycota	Agaricomycetes	Agaricales	Cortinariaceae	*Cortinarius armillatus*	red-banded webcap
Basidiomycota	Agaricomycetes	Agaricales	Cortinariaceae	*Cortinarius mucosus*	orange webcap
Basidiomycota	Dacrymycetes	Dacrymycetales	Dacrymycetaceae	*Dacrymyces*	
Ascomycota	Sordariomycetes	Xylariales	Hypoxylaceae	*Daldinia childiae*	
Basidiomycota	Agaricomycetes	Agaricales	Psathyrellaceae	*Domestici*	Coprinellus sect. Domestici
Basidiomycota	Agaricomycetes	Agaricales	Entolomataceae	*Entoloma*	Pinkgills

Phylum	Class	Order	Family	Scientific Name	Common Name
Zygomycota	Entomophthoromycetes	Entomophthorales	Entomophthoraceae	*Entomophaga grylli*	
Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	*Fomes excavatus*	Tinder Polypore
Basidiomycota	Agaricomycetes	Polyporales	Fomitopsidaceae	*Fomitopsis betulina*	birch polypore
Basidiomycota	Agaricomycetes	Polyporales	Fomitopsidaceae	*Fomitopsis mounceae*	Northern Red Belt
Basidiomycota	Agaricomycetes	Gloeophyllales	Gloeophyllaceae	*Gloeophyllum sepiarium*	Conifer Mazegill
Ascomycota	Pezizomycetes	Pezizales	Discinaceae	*Gyromitra*	
Ascomycota	Pezizomycetes	Pezizales	Discinaceae	*Gyromitra esculenta*	False Morel
Basidiomycota	Agaricomycetes	Agaricales	Hygrophoraceae	*Hygrocybe*	Waxcaps
Basidiomycota	Agaricomycetes	Agaricales	Hygrophoraceae	*Hygrocybe miniata*	Vermilion Waxcap
Basidiomycota	Agaricomycetes	Boletales	Hygrophoropsidaceae	*Hygrophoropsis aurantiaca*	False Chanterelle
Ascomycota	Sordariomycetes	Hypocreales	Hypocreaceae	*Hypomyces lactifluorum*	lobster mushroom
Basidiomycota	Agaricomycetes	Hymenochaetales	*Hymenochaetaceae*	*Inonotus obliquus*	chaga
Basidiomycota	Agaricomycetes	Agaricales	Hymenogastraceae	*Kuehneromyces*	
Basidiomycota	Agaricomycetes	Agaricales	Hydnangiaceae	*Laccaria proxima*	Scurfy Deceiver
Basidiomycota	Agaricomycetes	Russulales	Russulaceae	*Lactarius*	Common Milkcaps
Ascomycota	Lecanoromycetes			*Lecanoromycetes*	common lichens
Basidiomycota	Agaricomycetes	Boletales	Boletaceae	*Leccinum*	
Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	*Lentinus arcularius*	Spring Polypore
Basidiomycota	Agaricomycetes	Agaricales	Hygrophoraceae	*Lichenomphalia ericetorum*	Lichen Agaric
Ascomycota	Lecanoromycetes	Peltigerales	Lobariaceae	*Lobaria pulmonaria*	Tree Lungwort
Basidiomycota	Agaricomycetes	Agaricales	Lycoperdaceae	*Lycoperdaceae*	puffballs
Basidiomycota	Agaricomycetes	Agaricales	Lycoperdaceae	*Lycoperdon*	
Basidiomycota	Agaricomycetes	Agaricales	Lycoperdaceae	*Lycoperdon perlatum*	common puffball
Basidiomycota	Agaricomycetes	Gloeophyllales	Gloeophyllaceae	*Neolentinus lepideus*	Trainwrecker
Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	*Parmelia*	shield lichens
Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	*Parmelioideae*	typical shield lichens
Ascomycota	Lecanoromycetes	Peltigerales	Peltigeraceae	*Peltigera*	pelt lichens
Ascomycota	Lecanoromycetes	Peltigerales	Peltigeraceae	*Peltigera malacea*	veinless pelt lichen
Basidiomycota	Agaricomycetes	Russulales	Peniophoraceae	*Peniophora rufa*	Red Tree Brain Fungus
Ascomycota	Pezizomycetes	Pezizales	Pezizaceae	*Pezizaceae*	Pezizas, Desert Truffles, and Allies
Basidiomycota	Agaricomycetes	Agaricales	Phyllotopsidaceae	*Pleurocybella porrigens*	angel's wings
Basidiomycota	Agaricomycetes	Agaricales	Pleurotaceae	*Pleurotus*	Oyster Mushrooms

Phylum	Class	Order	Family	Scientific Name	Common Name
Basidiomycota	Agaricomycetes	Agaricales	Pleurotaceae	*Pleurotus populinus*	aspen oyster mushroom
Basidiomycota	Agaricomycetes	Gomphales	Gomphaceae	*Ramaria*	Coral Fungi
Ascomycota	Lecanoromycetes	Rhizocarpales	Rhizocarpaceae	*Rhizocarpon*	Map Lichens
Basidiomycota	Agaricomycetes	Agaricales	Omphalotaceae	*Rhodocollybia*	
Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	*Rusavskia sorediata*	Sugared Sunburst Lichen
Basidiomycota	Agaricomycetes	Russulales	Russulaceae	*Russula*	brittlegills
Basidiomycota	Agaricomycetes	Thelephorales	Bankeraceae	*Sarcodon imbricatus*	shingled hedgehog
Basidiomycota	Agaricomycetes	Agaricales	Schizophyllaceae	*Schizophyllum commune*	splitgill mushroom
Ascomycota	Lecanoromycetes	Lecanorales	Stereocaulaceae	*Stereocaulon*	Foam Lichens
Basidiomycota	Agaricomycetes	Boletales	Suillaceae	*Suillus*	Slippery Jacks
Basidiomycota	Agaricomycetes	Polyporales	Polyporaceae	*Trametes*	
Basidiomycota	Agaricomycetes	Polyporales	Incrustoporiaceae	*Tyromyces chioneus*	White Cheese Polypore
Ascomycota	Lecanoromycetes	Umbilicariales	Umbilicariaceae	*Umbilicaria muhlenbergii*	Lesser Rocktripe
Ascomycota	Pezizomycetes	Pezizales	Morchellaceae	*Verpa*	thimble morels
Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	*Vulpicida*	
Basidiomycota	Agaricomycetes	Agaricales	Xeromphalinaceae	*Xeromphalina*	

Appendix 23. Mammal species documented for the Great Bear Project area[1].

Common Name	Scientific Name	2021-2024	Within Potential Range
ORDER LAGOMORPHA - Pikas, Hares, and Rabbits			
Family Leporidae - Hares and Rabbits			
Snowshoe Hare	*Lepus americanus*	Y	Y
European Hare*	*Lepus europaeus*		
ORDER SORICOMORPHA – Insectivores			
Family Soricidae - Shrews			
Northern Short-tailed Shrew	*Blarina brevicauda*	Y	Y
Arctic Shrew	*Sorex arcticus*	Y	Y
Masked Shrew	*Sorex cinereus*	Y	Y
Smoky Shrew	*Sorex fumeus*		
Pygmy Shrew	*Sorex hoyi*	Y	Y
Water Shrew	*Sorex palustris*		Y
Family Talpidae - Moles			
Star-nosed Mole	*Condylura cristata*		?
ORDER CHIROPTERA - Bats			
Family Vespertilionidae - Vesper Bats			
Big Brown Bat	*Eptesicus fuscus*	Y	Y
Silver-haired Bat	*Lasionycteris noctivagans*	Y	Y
Eastern Red Bat	*Lasiurus borealis*	Y	Y
Hoary Bat	*Lasiurus cinereus*	Y	Y
Little Brown Myotis	*Myotis lucifugus*	Y	Y
Northern Myotis	*Myotis septentrionalis*	?	Y
Trl-colored Bat	*Perimyotis subflavus*	Y	Y
ORDER CARNIVORA - Carnivores			
Family Canidae - Dogs, Foxes, and Wolves			
Coyote	*Canis latrans*	Y	Y
Eastern Wolf	*Canis lupus lycaon*		
Northern Gray Wolf	*Canis lupus occidentalis*	Y	Y
Grey Fox	*Urocyon cinereoargenteus*		
Red Fox	*Vulpes vulpes*	Y	Y
Family Felidae - Cats			
Canada Lynx	*Lynx canadensis*	Y	Y
Bobcat	*Lynx rufus*		?
Cougar	*Puma concolor*		?
Family Mephitidae - Skunks			
Striped Skunk	*Mephitis mephitis*	Y	Y
Family Mustelidae - Weasels, Otters, and Badgers			
Wolverine	*Gulo gulo*	Y	Y
North American River Otter	*Lontra canadensis*	Y	Y
American Marten	*Martes americana*	Y	Y
Ermine	*Mustela erminea*	Y	Y
Long-tailed Weasel	*Mustela frenata*		
Least Weasel	*Mustela nivalis*		Y
American Mink	*Neovison vison*	Y	Y

Common Name	Scientific Name	2021-2024	Within Potential Range
Fisher	*Pekania pennanti*	Y	Y
American Badger	*Taxidea taxus*		
Family Procyonidae - Raccoons, Ringtails, and Coatis			
Northern Raccoon	*Procyon lotor*		Y
Family Ursidae - Bears			
American Black Bear	*Ursus americanus*	Y	Y
ORDER ARTIODACTYLA - Even-toed Ungulates			
Family Cervidae - Deer			
Moose	*Alces americanus*	Y	Y
Elk	*Cervus elaphus*		
White-tailed Deer	*Odocoileus virginianus*	Y	Y
Boreal Caribou	*Rangifer tarandus*		Y
ORDER RODENTIA - Rodents			
Family Castoridae - Beavers			
Beaver	*Castor canadensis*	Y	Y
Family Cricetidae - New World Mice, Rats, and Voles			
Rock Vole	*Microtus chrotorrhinus*		
Meadow Vole	*Microtus pennsylvanicus*	Y	Y
Southern Red-backed Vole	*Myodes gapperi*	Y	Y
Muskrat	*Ondatra zibethicus*	Y	Y
Deer Mouse	*Peromyscus maniculatus*	Y	Y
Eastern Heather Vole	*Phenacomys ungava*		Y
Northern Bog Lemming	*Synaptomys borealis*		
Southern Bog Lemming	*Synaptomys cooperi*		Y
Family Dipodidae - Jumping Mice			
Woodland Jumping Mouse	*Napaeozapus insignis*		?
Meadow Jumping Mouse	*Zapus hudsonius*		Y
Family Erethizontidae - New World Porcupines			
Porcupine	*Erethizon dorsatum*	Y	Y
Family Muridae - Old World Mice and Rats			
House Mouse*	*Mus musculus*		
Norway Rat*	*Rattus norvegicus*		
Family Mycocastoridae - Coypus			
Nutria*	*Myocastor coypus*		
Family Sciuridae - Squirrels			
Northern Flying Squirrel	*Glaucomys sabrinus*	Y	Y
Woodchuck	*Marmota monax*	Y	Y
Least Chipmunk	*Neotamias minimus*	Y	Y
Eastern Gray Squirrel	*Sciurus carolinensis*		
Eastern Chipmunk	*Tamias striatus*	Y	Y
Red Squirrel	*Tamiasciurus hudsonicus*	Y	Y

[1] Potential species derived from checklist of the mammals of the Thunder Bay District (TBFN 2018)

* non-native species

Appendix 24. Summary of wildlife observations on trail cameras deployed 2021-2024 at the Great Bear Project AOI.

Trail Camera Deployment	American Marten	American mink	Beaver	Black Bear	Canada Lynx	Coyote	Coyote or Gray Wolf	Fisher	Gray Wolf	Moose	Muskrat	River Otter	Flying Squirrel	Porcupine	Red Fox	Red Squirrel	Short-tailed Weasel	Snowshoe Hare	Striped Skunk	White-tailed Deer
RP2-1a	89			4	8		2	2					2			1				
TC-001b	1						1		9						2	1		4		
TC-001c				4					3							1				
TC-001d	2			4	9		2		17	2				1	2			7	5	
TC-002a				6	7	2		1	8	13								9		
TC-002b	3							4					2			35	6	6		
TC-002c				8					7	8										
TC-003a					1	1			6						1					
TC-003b									4											
TC-003c	1							5	1						14			1		
TC-003d			1						4	2	1									
TC-003e				6					5	25								1		1
TC-004a				2	10	1			21				2			17	1	3		
TC-004b	1			5	4				12	1						2		6		
TC-005a	5			7	18			3	30					2	1	8		37	3	
TC-006a				1	5	4		1	1	2	1					3		24		
TC-007a	1				2													1		
TC-007c					1				2	1								4		
TC-007d				1	1															
TC-011a										3										
TC-014a				15	10	1	2	1	12	9								13		
TC-021a															1			1		
TC-021b									1											
TC-021d										3										
TC-022a			1		15				2									1		
TC-022c																				
TC-023b				7	3		1	1	4	25						6		8		
TC-024a				5	5	1			6	3								4		
TC-024b				9	1					1										

Trail Camera Deployment	American Marten	American mink	Beaver	Black Bear	Canada Lynx	Coyote	Coyote or Gray Wolf	Fisher	Gray Wolf	Moose	Muskrat	River Otter	Flying Squirrel	Porcupine	Red Fox	Red Squirrel	Short-tailed Weasel	Snowshoe Hare	Striped Skunk	White-tailed Deer
TC-025a																				
TC-025b				1	5	2				3						2		7		
TC-026a				1		1		1								2		2	1	
TC-031a				4	2				8	2								3		
TC-050a				1					2	8										
TC-051a				5					2	3										
TC-054a									7	9					1					
TC-060a	8			4	25	26		5	21	31		1		2	98	14		45	15	
TC-061a				2					1											
TC-062a	3			4		3				3								4		
TC-064a										2										
TC-065a				3						7			2			2				
TC-066a				8	5				1	2			1							
TC-067b				2		1														
TC-068a			1	3	5				4	4	34							11		
TC-069a				2	5					3						1		3		
TC-300a	2			12	4		1	1	17	3				4	1	14		16		1
TC-301a		2	3	1	1			2	7	3			1		1	16		1		
TC-301b				1	5				1	1										
TC-301c				5	14					11								1		
TC-501a									14	1					2					
Grand Total	**116**	**2**	**6**	**143**	**171**	**43**	**9**	**27**	**240**	**194**	**36**	**1**	**10**	**9**	**124**	**125**	**7**	**223**	**24**	**2**

Appendix 25. Representative trail camera photos from 2021-2022 deployments at Great Bear AOI.

Gray Wolf

Canada Lynx

Moose

Snowshoe Hare

North American River Otter

Coyote

Short-tailed Weasel (Ermine)

Northern Flying Squirrel

Appendix 26. Wildlife observations from February 2022 aerial survey.

Taxa	# Ind.	Notes	Easting	Northing
bald eagle	1	flying	446259	5637809
bald eagle nest			452398	5630443
bald eagle nest			456063	5633474
bald eagle nest			465534	5638533
bald eagle nest			465820	5636894
bald eagle nest			465885	5635732
bald eagle nest			466213	5635838
bald eagle nest			466765	5630579
lynx tracks			445755	5633541
lynx tracks			446832	5633853
lynx tracks			447711	5631642
lynx tracks			447817	5633398
lynx tracks			448272	5633517
lynx tracks			448777	5635870
lynx tracks			449202	5636530
lynx tracks			449775	5632105
lynx tracks			451094	5636070
lynx tracks			454806	5630220
lynx tracks			454856	5633751
lynx tracks			455192	5630017
lynx tracks			455756	5631326
lynx tracks			455875	5633643
lynx tracks			456262	5634202
lynx tracks			457742	5636025
lynx tracks			458362	5636304
lynx tracks			459144	5635814
lynx tracks			461808	5633677
lynx tracks			462722	5629792
lynx tracks			462724	5630454
lynx tracks			464227	5629358
lynx tracks			465807	5636226
lynx tracks			468203	5637775
lynx tracks			468824	5638511
marten tracks?			444766	5639607
marten tracks?			451792	5638266
marten tracks?			455162	5629155
marten tracks?			461787	5635346
moose	2	2 unknown sex	446831	5638677
moose	1	1 cow	451305	5636158
moose	2	1 cow and calf?	451807	5631221

Taxa	# Ind.	Notes	Easting	Northing
moose	1	1 bull	454594	5632551
moose	2	1 cow and calf	454847	5631664
moose	1	unknown sex	456293	5633257
moose	1	unknown sex	457232	5632656
moose	3	1 bull, 2 unknown sex	457897	5635160
moose	1	1 cow	458907	5632459
moose	2	2 bulls	461068	5634709
moose	2	1 cow and calf	462984	5628845
moose tracks (fresh)			445741	5631208
moose tracks (fresh)			449870	5640589
moose tracks (fresh)		bed	450825	5636366
moose tracks (fresh)			451335	5634670
moose tracks (fresh)			452533	5630123
moose tracks (fresh)			452764	5629618
moose tracks (fresh)			453175	5630011
moose tracks (fresh)			455209	5631552
moose tracks (fresh)			455289	5639486
moose tracks (fresh)			457236	5632418
moose tracks (fresh)			457853	5634961
moose tracks (fresh)			458270	5632718
moose tracks (fresh)			458944	5635443
moose tracks (fresh)			461804	5636039
moose tracks (fresh)			467084	5633204
moose tracks (fresh)			467220	5638509
moose tracks (fresh)			467485	5633757
moose tracks (fresh)			467618	5630116
moose tracks (fresh)			467621	5630341
moose tracks (old)			445400	5639762
moose tracks (old)			445747	5630415
moose tracks (old)			445798	5640456
moose tracks (old)			445800	5634494
moose tracks (old)			445809	5640142
moose tracks (old)			445833	5638216
moose tracks (old)			446321	5639432
moose tracks (old)			446384	5629964
moose tracks (old)			446657	5640631
moose tracks (old)			446681	5640260
moose tracks (old)			446774	5630953
moose tracks (old)			446830	5637196
moose tracks (old)			447223	5633830
moose tracks (old)			447236	5637284
moose tracks (old)			447693	5630606

Taxa	# Ind.	Notes	Easting	Northing
moose tracks (old)			447844	5636020
moose tracks (old)			448188	5633621
moose tracks (old)			448278	5634636
moose tracks (old)			448303	5630658
moose tracks (old)			448756	5641151
moose tracks (old)			448782	5633270
moose tracks (old)			448821	5640454
moose tracks (old)			449183	5632311
moose tracks (old)			449216	5636689
moose tracks (old)			449281	5640323
moose tracks (old)			449306	5639653
moose tracks (old)			449838	5638280
moose tracks (old)			449852	5638517
moose tracks (old)			449879	5639266
moose tracks (old)			449883	5640408
moose tracks (old)			449885	5639908
moose tracks (old)			450191	5638757
moose tracks (old)			450191	5638216
moose tracks (old)			450777	5639228
moose tracks (old)			450780	5637331
moose tracks (old)			450784	5637603
moose tracks (old)			450787	5638499
moose tracks (old)			450804	5635725
moose tracks (old)			450814	5635033
moose tracks (old)			450918	5631953
moose tracks (old)			451182	5636292
moose tracks (old)			451235	5637385
moose tracks (old)			451524	5630287
moose tracks (old)			451788	5637255
moose tracks (old)			451846	5635373
moose tracks (old)			452319	5635091
moose tracks (old)			452470	5630082
moose tracks (old)			452704	5632746
moose tracks (old)			452705	5633699
moose tracks (old)			452788	5636188
moose tracks (old)			453185	5630371
moose tracks (old)			453208	5631244
moose tracks (old)			453243	5632560
moose tracks (old)			453723	5630552
moose tracks (old)			453734	5631521
moose tracks (old)			453806	5633236
moose tracks (old)			454296	5633511

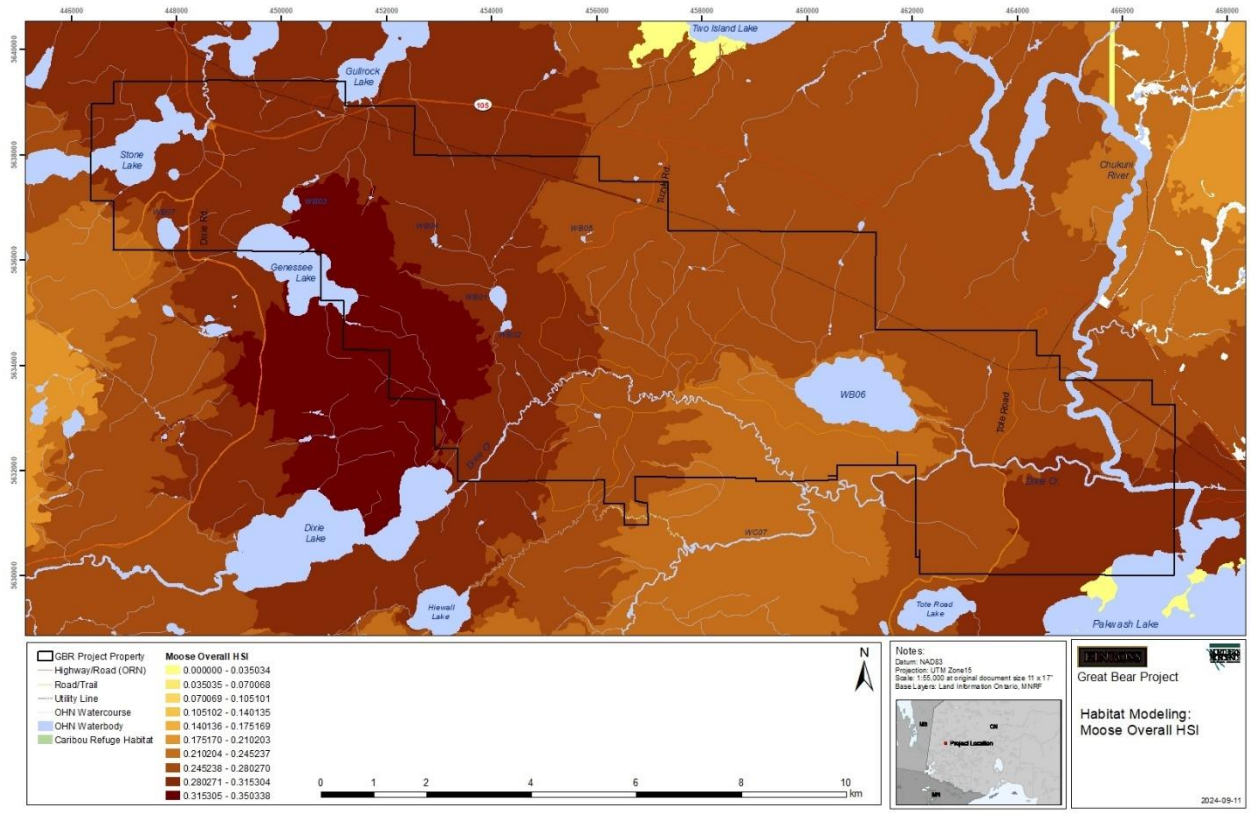
Taxa	# Ind.	Notes	Easting	Northing
moose tracks (old)			454322	5631059
moose tracks (old)			454801	5629567
moose tracks (old)			454810	5629963
moose tracks (old)			455091	5629313
moose tracks (old)			455178	5629691
moose tracks (old)			455218	5630589
moose tracks (old)			456843	5635725
moose tracks (old)			456850	5632548
moose tracks (old)			457212	5634865
moose tracks (old)			457787	5632328
moose tracks (old)			458138	5632219
moose tracks (old)			458884	5635180
moose tracks (old)			459254	5632316
moose tracks (old)			459257	5631748
moose tracks (old)			459298	5634754
moose tracks (old)			459828	5638210
moose tracks (old)			460245	5634138
moose tracks (old)			460528	5629097
moose tracks (old)			460720	5634444
moose tracks (old)			460746	5635769
moose tracks (old)			461278	5635700
moose tracks (old)			461284	5635344
moose tracks (old)			461680	5636146
moose tracks (old)			461788	5635524
moose tracks (old)			462264	5628448
moose tracks (old)			462721	5630216
moose tracks (old)			463278	5629132
moose tracks (old)			463289	5629448
moose tracks (old)			463742	5630224
moose tracks (old)			464205	5630974
moose tracks (old)			464223	5630468
moose tracks (old)			464230	5637232
moose tracks (old)			464792	5630320
moose tracks (old)			464820	5631641
moose tracks (old)			464820	5631785
moose tracks (old)			464862	5638108
moose tracks (old)			465776	5630569
moose tracks (old)			465802	5633241
moose tracks (old)			466260	5632109
moose tracks (old)			466759	5636577
moose tracks (old)			466793	5632799
moose tracks (old)			466820	5633235

Taxa	# Ind.	Notes	Easting	Northing
moose tracks (old)			467225	5632269
moose tracks (old)			467244	5634443
moose tracks (old)			467246	5631666
moose tracks (old)			467845	5633396
moose tracks (old)			468144	5634615
moose tracks (old)			468212	5630334
moose tracks (old)			468219	5630929
moose tracks (old)			468830	5635564
moose tracks (old)			468831	5633453
moose tracks (old)			468834	5634266
nest: unknown species			461344	5629213
nest: unknown species			465142	5633077
otter tracks			448200	5629520
otter tracks			452667	5631885
otter tracks			454705	5633908
otter tracks			461664	5629238
otter tracks			466753	5638975
otter tracks			466772	5631831
otter tracks			466773	5634846
otter tracks			467254	5635665
otter tracks			468188	5637050
otter tracks			468189	5631778
red fox tracks			448802	5638704
red fox tracks			467249	5631786
sharp-tailed grouse	5	loose flock	444141	5630002
sharp-tailed grouse	4	loose flock	459859	5633234
snowshoe hare tracks			446847	5634958
snowshoe hare tracks			462530	5634260
snowshoe hare tracks			462788	5633467
snowshoe hare tracks			463242	5632650
snowshoe hare tracks			467733	5636809
spruce grouse	1		444790	5633355
wolf	1	black pelage	447141	5640210
wolf	1		479185	5613609
wolf tracks (fresh)			451524	5634866
wolf tracks (fresh)			454819	5634699
wolf tracks (fresh)			455176	5634728
wolf tracks (fresh)			455199	5630089
wolf tracks (fresh)			456167	5633438
wolf tracks (fresh)			457230	5638531
wolf tracks (fresh)			459140	5635793
wolf tracks (fresh)			459283	5635756

Taxa	# Ind.	Notes	Easting	Northing
wolf tracks (fresh)			461264	5628250
wolf tracks (fresh)			461453	5628574
wolf tracks (old)			446824	5633250
wolf tracks (old)			447148	5640614
wolf tracks (old)			447210	5638490
wolf tracks (old)			447780	5639168
wolf tracks (old)			447811	5640747
wolf tracks (old)			447813	5640087
wolf tracks (old)			448267	5640492
wolf tracks (old)			448325	5635972
wolf tracks (old)			448343	5637287
wolf tracks (old)			448791	5633615
wolf tracks (old)			449774	5632559
wolf tracks (old)			450889	5636725
wolf tracks (old)			452874	5638714
wolf tracks (old)			459792	5634535
wolf tracks (old)			462724	5629992
wolf tracks (old)			464798	5630897

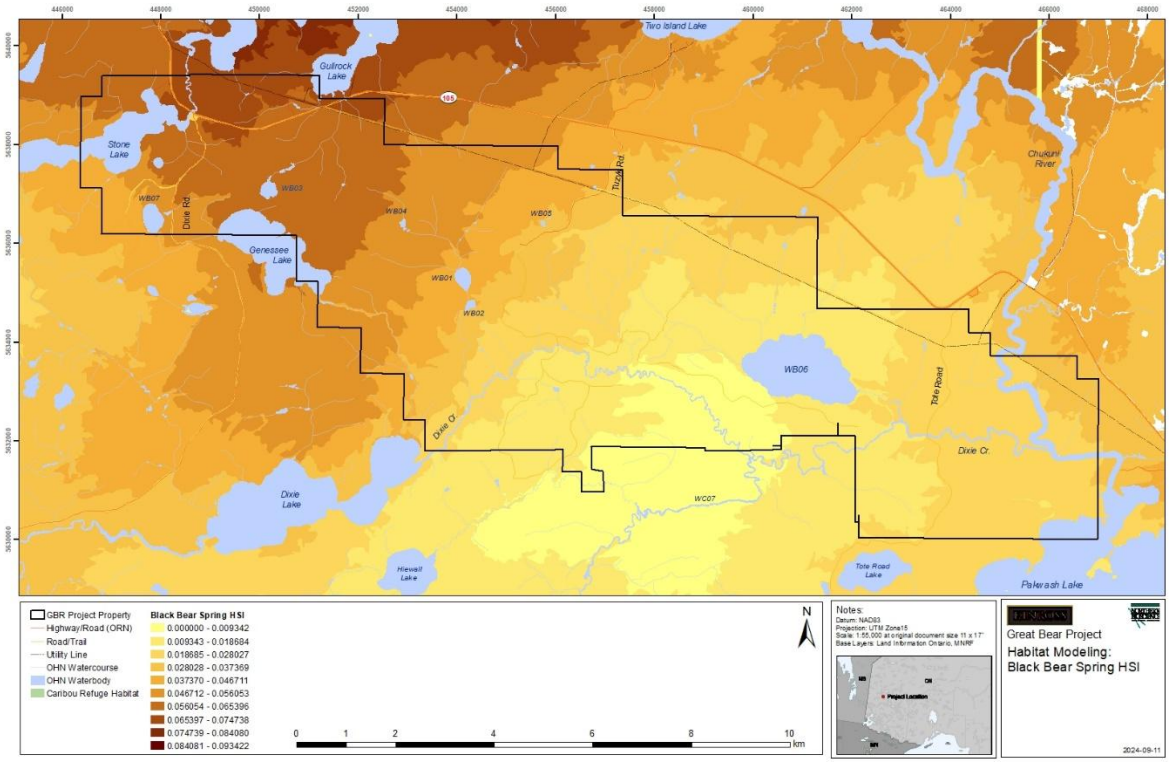
Appendix 27. Mammal Habitat Modeling Results

Moose

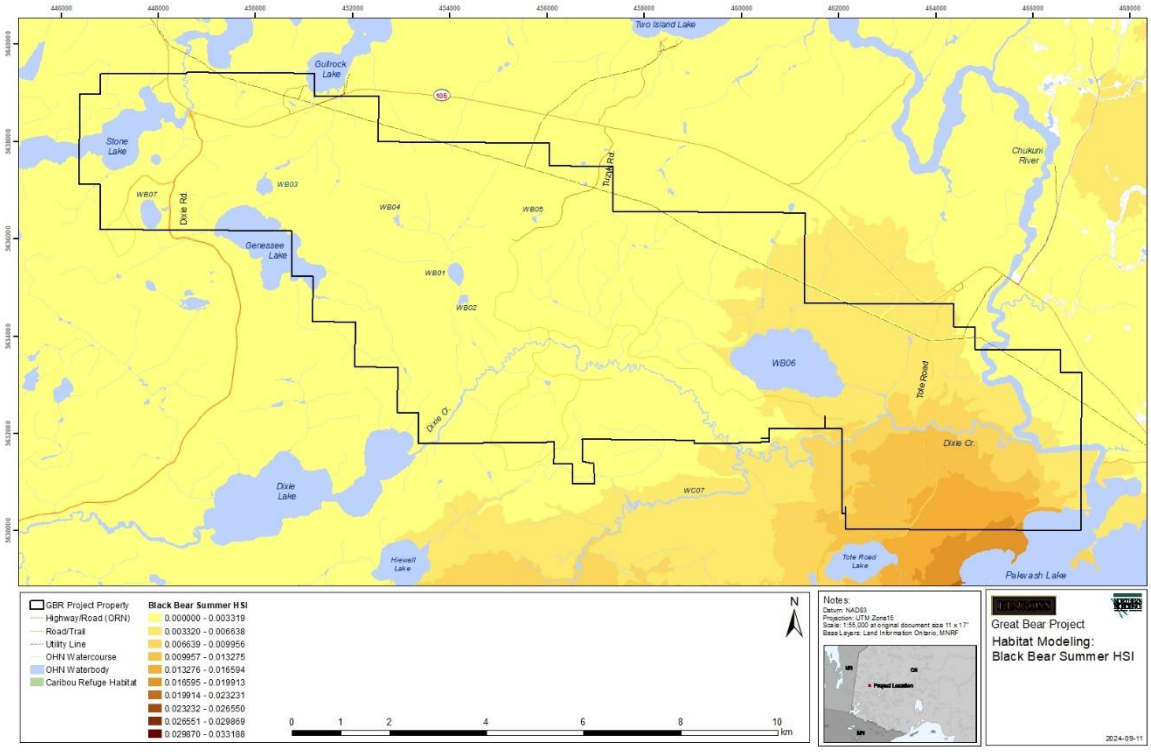


Black Bear

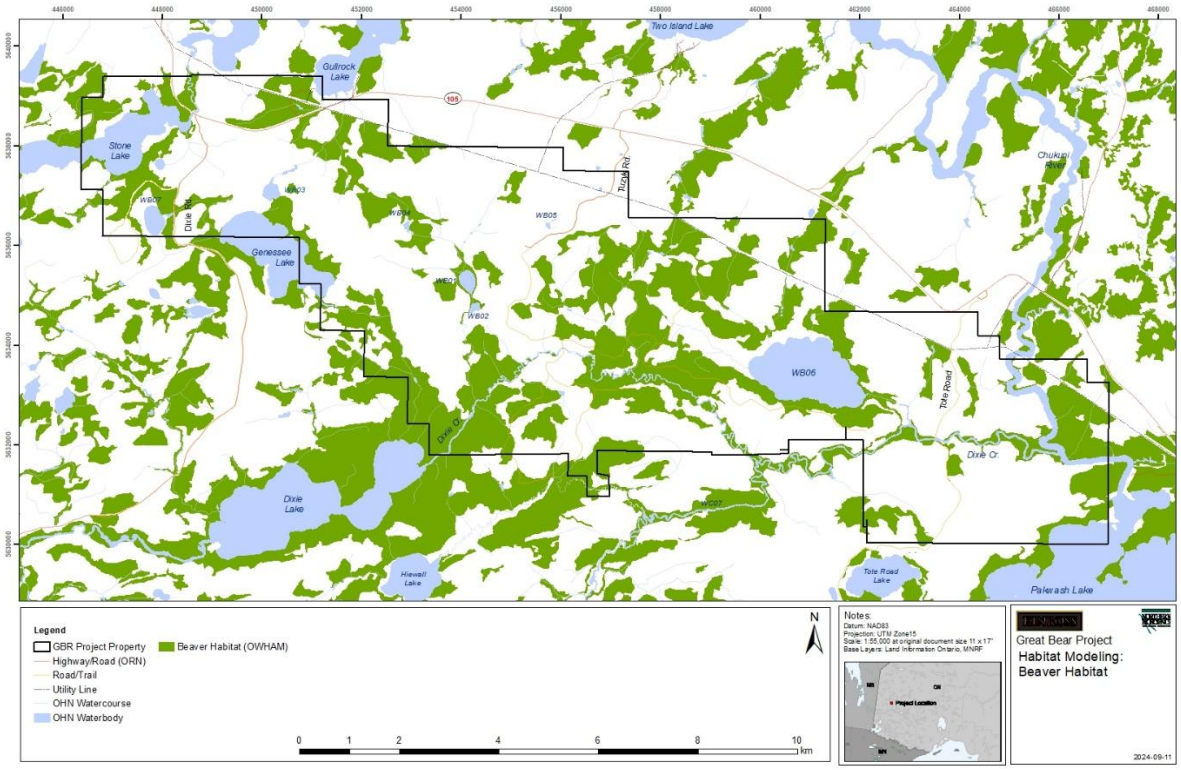
Spring HSI



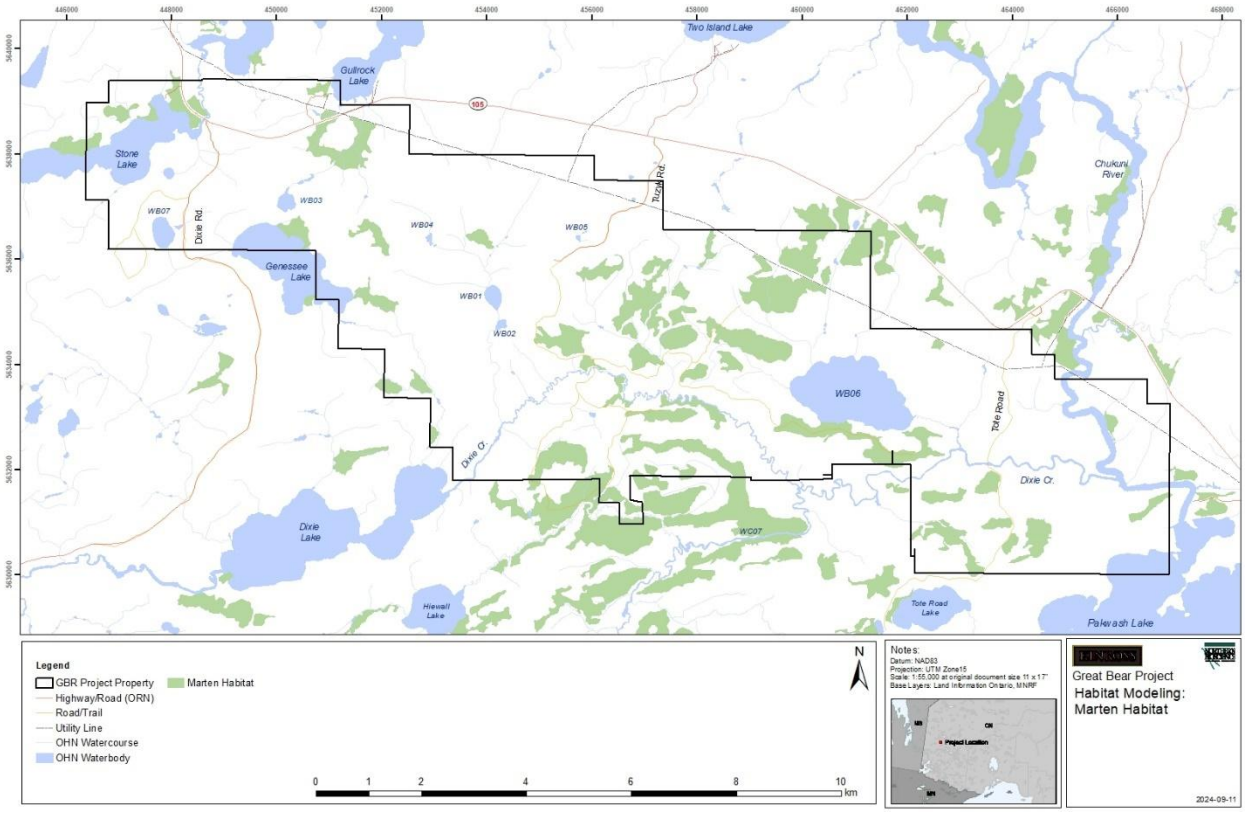
Summer HSI



Beaver



American Marten



Appendix 28. Bats detected during in-person surveys at the GBR Property in 2022-2023.

Date	Location	Station #	Time Start	Easting	Northing	Silver-haired Bat LASNOC	Hoary Bat LASCIN	Little Brown Myotis MYOLUC	Tricolored Bat PERISUB
2022-06-07	Loop Road	1	21:58	456410	5632041	1			
2022-06-07	Loop Road	2	22:09	456633	5632917		1		
2022-06-07	Loop Road	7	22:53	455207	5635820		1		
2022-06-08	Tote Road	3	22:12	462303	5629880	1			
2022-06-08	Tote Road	4	22:18	462764	5629921		1		
2022-06-08	Tote Road	6	22:31	463584	5630218		1		
2022-06-08	Tote Road	7	22:37	463874	5630646		1		
2022-06-08	Loop Road	9	23:08	456676	5636940		1		
2022-06-08	Loop Road	10	23:17	457191	5637712	1	1		
2022-06-08	Tote Road	10	22:56	463673	5631984		1		
2022-06-08	Loop Road	11	23:24	457195	5638304		1		
2022-06-08	Hwy 105	14	23:49	451819	5638988	1			
2022-06-09	Loop Road	2	22:13	456382	5632520		1		
2022-06-09	Tote Road	11	23:02	463586	5632378		1		
2022-06-09	Tote Road	13	23:19	463929	5633255		1		
2022-06-09	Tote Road	14	23:25	463809	5633756		1		
2022-06-09	Tote Road	15	23:31	463834	5633931	1			
2022-06-09	Dixie Road N	19	00:15	448815	5638093	1	1		
2022-06-09	Dixie Road N	22	00:35	448232	5636820	1			
2022-06-10	Dixie Road N	5	22:50	448223	5636362		1		
2022-06-10	Dixie Road N	6	22:56	448256	5636918		1		
2022-06-10	Loop Road	12	23:21	455371	5635515		1		
2022-06-10	Loop Road	13	23:27	455219	5635833		1		
2022-06-10	Loop Road	18	23:59	456984	5637068		1		
2022-06-10	Loop Road	19	00:06	457184	5637695		1		
2022-06-10	Hwy 105	22	00:28	454649	5638806		1		
2022-06-10	Hwy 105	24	00:45	451817	5638988	1			
2022-06-10	Hwy 105	25	00:52	450564	5638523		1		
2022-06-10	Dixie Road N	26	00:59	448646	5638629		1		
2022-06-10	Hwy 105	27	01:08	448177	5639290		1		
2022-06-11	Dixie Road N	7	23:03	448425	5637349	1			
2022-06-11	Dixie Road N	8	23:09	448766	5637657		1		
2022-06-11	Dixie Road N	9	23:18	448806	5638123		1		
2022-06-11	Dixie Road N	10	23:25	448649	5638599	1	1		
2022-06-11	Tote Road	15	22:30	463251	5629907		1		
2022-06-11	Tote Road	18	22:50	463975	5631099		1		
2022-06-11	Tote Road	19	22:56	463737	5631523		1		
2022-06-12	Tote Road	20	23:03	463664	5631993		1		
2022-06-12	Tote Road	21	23:10	463589	5632381	1	1		
2022-06-12	Tote Road	22	23:17	463875	5632778		1		
2022-06-12	Tote Road	23	23:23	463928	5633237		1		
2022-06-12	Tote Road	25	23:36	463838	5633932	1			
2022-06-12	Tote Road	27	23:48	464247	5634811		1		
2022-07-02	Loop Road	1	22:01	456376	5632539	1			
2022-07-02	Loop Road	3	22:20	456343	5633220		1		
2022-07-02	Loop Road	4	22:30	455899	5633283		1		
2022-07-02	Loop Road	5	22:38	455775	5633659		1		
2022-07-02	Tuzyk's Road	6	22:47	456009	5634112		1		
2022-07-02	Tuzyk's Road	7	22:53	455607	5634129		1		
2022-07-02	Tuzyk's Road	8	23:00	455143	5634272		1		

Date	Location	Station #	Time Start	Easting	Northing	Silver-haired Bat LASNOC	Hoary Bat LASCIN	Little Brown Myotis MYOLUC	Tricolored Bat PERISUB
2022-07-02	Tuzyk's Road	9	23:08	454939	5634636		1		
2022-07-02	Tuzyk's Road	10	23:15	455280	5634931		1		
2022-07-02	Tuzyk's Road	11	23:24	455367	5635524		1		
2022-07-02	Tuzyk's Road	12	23:31	455222	5635839		1		
2022-07-02	Tuzyk's Road	13	23:38	455613	5636120	1	1		
2022-07-02	Tuzyk's Road	14	23:45	456131	5636269		1		
2022-07-02	Tuzyk's Road	15	23:52	456316	5636679		1		
2022-07-02	Tuzyk's Road	16	23:59	456702	5636950	1	1		
2022-07-02	Dixie Road N	1	22:05	448531	5636040	1			
2022-07-02	Dixie Road N	2	22:15	448219	5636336		1		
2022-07-02	Dixie Road N	3	22:25	448231	5636834		1		
2022-07-02	Dixie Road N	4	22:35	448368	5637310	1	1		
2022-07-02	Dixie Road N	5	22:45	447889	5637222	1			
2022-07-02	Dixie Road N	6	22:57	448744	5637648		1		
2022-07-02	Dixie Road N	7	23:07	448813	5638111		1		
2022-07-02	Dixie Road N	8	23:14	448640	5638601		1		
2022-07-03	Tote Road	1	22:03	461591	5629300		1		
2022-07-03	Tote Road	4	22:22	462762	5629920		1		
2022-07-03	Tote Road	5	22:29	463260	5629900		1		
2022-07-03	Tote Road	6	22:36	463589	5630230		1		
2022-07-03	Tote Road	7	22:43	463870	5630650		1		
2022-07-03	Tote Road	8	22:50	463963	5631110		1		
2022-07-03	Tote Road	9	22:56	463737	5631520	1			
2022-07-03	Tote Road	10	23:02	463671	5631990	1			
2022-07-03	Tote Road	12	23:16	463875	5632780		1		
2022-07-03	Tote Road	13	23:22	463925	5633260	1	1		
2022-07-03	Tote Road	14	23:29	463807	5633750		1		
2022-07-03	Tote Road	15	23:35	463836	5633930		1		
2022-07-03	Tote Road	16	23:41	464017	5634390		1		
2022-07-03	Tote Road	17	23:48	464260	5634830		1		
2022-07-03	Tuzyk's Road	2	00:15	457193	5637706	1	1		
2022-07-03	Tuzyk's Road	3	00:22	457174	5638234	1	1		
2023-06-03	Tuzyk's Road	7	22:49	455338	5635037	1			
2023-06-03	Tuzyk's Road	13	23:35	456801	5636958		1		
2023-06-10	Tuzyk's Road	3	22:24	454932	5634780		1		
2023-06-10	Tuzyk's Road	5	22:41	455365	5635964		1		
2023-07-05	Tote Road	4	22:47	463918	5632844	1	1		
2023-07-05	Tote Road	5	22:40	463601	5632433	1	1	1	
2023-07-05	Tote Road	6	22:32	463730	5631943		1		
2023-07-05	Tote Road	7	22:27	463744	5631421		1		
2023-07-05	Tote Road	10	22:17	463447	5630054		1		
2023-07-05	Tuzyk's Road	4	22:33	454932	5634779			1	
2023-07-05	Tuzyk's Road	5	22:41	455391	5635314	1	1		
2023-07-05	Tuzyk's Road	9	23:16	457264	5636938				1

Appendix 29. Potential bat maternity roost trees observed during November 2021 survey.

Survey Point ID#	Snag #	Easting	Northing	Tree Species	Approx, Height (m)	Approx. Diameter (cm)	Notes
Y-937	1	459579	5635716	Pj	10	23	two holes in longitudinal crack near the top, faces south
T778	2	457674	5637047	La	14	17	1 hole 10 m up, 2X4". In snag.
T778	3	457671	5637045	La	16	30	Extensive loose bark along bole of tree. Dead La. No holes.
T778	4	457674	5637040	La	10	25	2x8" natural cavity 8m up.
E314	5	456311	5636489	Pj	5	25	Old woodpecker hole 3.5m up in burned Pj snag.
E321	6	456409	5636490	Pj	12	25	2x2" woodpecker hole in snag
I410	7	454104	5634767	La	8	20	1 hole in dead La. 1.5X1.5"
J431	8	455299	5634170	Unknown conifer	12	25	Probably Pj. 2 holes 11.5m up, 1 hole 8m up. All holes 1x2".
J444	9	455648	5634079	Unknown conifer	4	35	2 vertical tracks
K481	10	455687	4633158	Unknown conifer	7	30	1x2' hole, 6m up
N596	11	457792	5632789	Bp	4	40	1 m up, 1 hole 3x5.
R728	12	455184	5632694	Pj	6	30	1 hole 4m up. 2x3"
L527	13	454888	5632087	Bw	8	25	2 holes; 4x4", 7.5m up, 4x3"7m up.
L506	14	454780	5631951	Pob	20	70	6 holes, 3x4", 12-19m up.
L532	15	454639	5632027	Unknown conifer	8	35	2 holes, 2x4", 5-6m up.

Appendix 30. Breeding evidence for bird species of the Great Bear AOI and adjacent landscape.

The following species were observed or heard in the Great Bear Project AOI during 2021-2023 field surveys in comparison to results from the Ontario Breeding Bird Atlas (BSC et a. 2006). Nomenclature follow AOS (2024). Presented alphabetically by family then scientific name.

Breeding Evidence Levels, Categories and Codes

Breeding evidence codes follow the Ontario Breeding Bird Atlas (Cadman et al. 2007):

X Non-breeding e.g., migrant or vagrant

POSSIBLE BREEDING

H Species observed in its breeding season in suitable nesting habitat.

S Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat.

PROBABLE BREEDING

P Pair observed in their breeding season in suitable nesting habitat.

T Permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place.

D Courtship or display between a male and a female or 2 males, including courtship feeding or copulation.

V Visiting probable nest site.

A Agitated behaviour or anxiety calls of an adult.

B Brood patch on adult female or cloacal protuberance on adult male.

N Nest-building or excavation of nest hole.

CONFIRMED BREEDING

DD Distraction display or injury feigning.

NU Used nest or egg shell found (occupied or laid within the period of the study).

FY Recently fledged young or downy young, including young incapable of sustained flight.

AE Adults leaving or entering nest site in circumstances indicating occupied nest.

FS Adult carrying faecal sac.

CF Adult carrying food for young.

NE Nest containing eggs.

NY Nest with young seen or heard.

Family	Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Point Counts	Total # Observed (Plot + Flyover)	# on other surveys or incidental obs.	Highest Nesting Evidence
Accipitridae	Northern Goshawk	*Accipiter gentilis*	NOGO				1	H
Accipitridae	Sharp-shinned Hawk	*Accipiter striatus*	SSHA	1	2	2	3	CF
Accipitridae	Red-tailed Hawk	*Buteo jamaicensis*	RTHA	4	3	4	2	N
Accipitridae	Broad-winged Hawk	*Buteo platypterus*	BWHA	16	13	17	4	N
Accipitridae	Northern Harrier	*Circus hudsonius*	NOHA	2	1	2	2	H
Accipitridae	Bald Eagle	*Haliaeetus leucocephalus*	BAEA	32	23	45	12	P
Alcedinidae	Belted Kingfisher	*Megaceryle alcyon*	BEKI	21	15	21	4	N
Anatidae	Wood Duck	*Aix sponsa*	WODU				1	H
Anatidae	Northern Pintail	*Anas acuta*	NOPI				1	H
Anatidae	Green-winged Teal	*Anas crecca*	GWTE	3	3	4	3	NY
Anatidae	Mallard	*Anas platyrhynchos*	MALL	25	24	54	7	P
Anatidae	American Black Duck	*Anas rubripes*	ABDU				2	H
Anatidae	Snow Goose	*Anser caerulescens*	SNGO				2	X
Anatidae	Ring-necked Duck	*Aythya collaris*	RNDU	5	0	8	7	NY
Anatidae	Canada Goose	*Branta canadensis*	CANG	52	59	764	5	P
Anatidae	Bufflehead	*Bucephala albeola*	BUFF	2	2	2	2	H
Anatidae	Common Goldeneye	*Bucephala clangula*	COGO	14	17	27	4	NY
Anatidae	Trumpeter Swan	*Cygnus buccinator*	TRUS	8	3	15	4	P
Anatidae	Hooded Merganser	*Lophodytes cucullatus*	HOME	3	1	4	1	H
Anatidae	American Wigeon	*Mareca americana*	AMWI	2	3	3	2	FY
Anatidae	Common Merganser	*Mergus merganser*	COME	4	1	4		H
Anatidae	Red-breasted Merganser	*Mergus serrator*	RBME	2	2	2		H
Anatidae	Blue-winged Teal	*Spatula discors*	BWTE	3	1	5	1	H
Ardeidae	Great Blue Heron	*Ardea herodias*	GBHE	5	0	8		H
Ardeidae	American Bittern	*Botaurus lentiginosus*	AMBI	1	1	1		S
Bombycillidae	Cedar Waxwing	*Bombycilla cedrorum*	CEDW	43	70	82	1	H
Caprimulgidae	Eastern Whip-poor-will	*Antrostomus vociferus*	EWPW				9	T
Caprimulgidae	Common Nighthawk	*Chordeiles minor*	CONI	1	1	1	5	S
Cardinalidae	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	RBGR	17	18	18	1	S
Cathartidae	Turkey Vulture	*Cathartes aura*	TUVU	5	5	7	1	H
Certhiidae	Brown Creeper	*Certhia americana*	BRCR	13	15	15		S
Charadriidae	Killdeer	*Charadrius vociferus*	KILL	2	1	2		H
Corvidae	American Crow	*Corvus brachyrhynchos*	AMCR	94	125	134		H
Corvidae	Common Raven	*Corvus corax*	CORA	130	160	192	5	N
Corvidae	Blue Jay	*Cyanocitta cristata*	BLJA	130	165	174	1	S

Family	Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Point Counts	Total # Observed (Plot + Flyover)	# on other surveys or incidental obs.	Highest Nesting Evidence
Corvidae	Canada Jay	*Perisoreus canadensis*	CAJA	56	83	90	3	H
Corvidae	Black-billed Magpie	*Pica hudsonia*	BBMA				1	H
Cuculidae	Black-billed Cuckoo	*Coccyzus erythropthalmus*	BBCU	3	3	3		S
Falconidae	Merlin	*Falco columbarius*	MERL	1	0	1	1	H
Falconidae	American Kestrel	*Falco sparverius*	AMKE	12	13	14	1	H
Fringillidae	Evening Grosbeak	*Coccothraustes vespertinus*	EVGR	5	6	12		H
Fringillidae	Purple Finch	*Haemorhous purpureus*	PUFI	30	25	30		S
Fringillidae	White-winged Crossbill	*Loxia leucoptera*	WWCR	1	0	1	1	H
Fringillidae	Pine Grosbeak	*Pinicola enucleator*	PIGR				1	H
Fringillidae	Pine Siskin	*Spinus pinus*	PISI	17	13	29		S
Fringillidae	American Goldfinch	*Spinus tristis*	AMGO	10	14	17		S
Gaviidae	Common Loon	*Gavia immer*	COLO	36	37	44	6	P
Gruidae	Sandhill Crane	*Antigone canadensis*	SACR	17	22	29	2	P
Hirundinidae	Barn Swallow	*Hirundo rustica*	BARS	4	12	15		AE
Hirundinidae	Cliff Swallow	*Petrochelidon pyrrhonota*	CLSW	1	6	6		H
Hirundinidae	Bank Swallow	*Riparia riparia*	BANS	5	12	16		AE
Hirundinidae	Tree Swallow	*Tachycineta bicolor*	TRES	6	7	13		H
Icteridae	Red-winged Blackbird	*Agelaius phoeniceus*	RWBL	33	87	94	2	S
Icteridae	Rusty Blackbird	*Euphagus carolinus*	RUBL	1	0	2	1	H
Icteridae	Brown-headed Cowbird	*Molothrus ater*	BHCO	1	1	1		H
Icteridae	Common Grackle	*Quiscalus quiscula*	COGR	16	20	27	3	S
Laridae	Bonaparte's Gull	*Chroicocephalus philadelphia*	BOGU	5	8	13	3	FY
Laridae	Herring Gull	*Larus argentatus*	HERG	30	51	72	1	X
Laridae	Ring-billed Gull	*Larus delawarensis*	RBGU	19	45	61		X
Laridae	Common Tern	*Sterna hirundo*	COTE	5	6	15	2	X
Motacillidae	American Pipit	*Anthus rubescens*	AMPI				1	X
Pandionidae	Osprey	*Pandion haliaetus*	OSPR	1	1	1		H
Paridae	Black-capped Chickadee	*Poecile atricapillus*	BCCH	109	139	139		T
Paridae	Boreal Chickadee	*Poecile hudsonicus*	BOCH	13	17	17	2	S
Parulidae	Canada Warbler	*Cardellina canadensis*	CAWA	15	15	16	9	S
Parulidae	Wilson's Warbler	*Cardellina pusilla*	WIWA	15	18	18	1	S
Parulidae	Mourning Warbler	*Geothlypis philadelphia*	MOWA	98	118	119		S
Parulidae	Common Yellowthroat	*Geothlypis trichas*	COYE	64	80	81		S
Parulidae	Black-and-white Warbler	*Mniotilta varia*	BAWW	49	51	52		S

Family	Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Point Counts	Total # Observed (Plot + Flyover)	# on other surveys or incidental obs.	Highest Nesting Evidence
Parulidae	Connecticut Warbler	*Oporornis agilis*	CONW	9	9	9		T
Parulidae	Orange-crowned Warbler	*Oreothlypis celata*	OCWA	4	4	4		S
Parulidae	Tennessee Warbler	*Oreothlypis peregrina*	TEWA	161	218	218		S
Parulidae	Nashville Warbler	*Oreothlypis ruficapilla*	NAWA	319	607	607	2	S
Parulidae	Northern Waterthrush	*Parkesia noveboracensis*	NOWA	16	17	17		S
Parulidae	Ovenbird	*Seiurus aurocapilla*	OVEN	249	440	441	3	S
Parulidae	Northern Parula	*Setophaga americana*	NOPA	53	54	54	2	S
Parulidae	Black-throated Blue Warbler	*Setophaga caerulescens*	BTBW	1	0	0		S
Parulidae	Bay-breasted Warbler	*Setophaga castanea*	BBWA	4	5	5		S
Parulidae	Yellow-rumped Warbler	*Setophaga coronata*	YRWA	137	155	156	1	S
Parulidae	Blackburnian Warbler	*Setophaga fusca*	BLBW	56	58	58		S
Parulidae	Magnolia Warbler	*Setophaga magnolia*	MAWA	157	215	215		S
Parulidae	Palm Warbler	*Setophaga palmarum*	PAWA	43	63	63		S
Parulidae	Chestnut-sided Warbler	*Setophaga pensylvanica*	CSWA	83	109	110		S
Parulidae	Yellow Warbler	*Setophaga petechia*	YEWA	8	8	8		S
Parulidae	American Redstart	*Setophaga ruticilla*	AMRE	25	27	27		S
Parulidae	Cape May Warbler	*Setophaga tigrina*	CMWA	9	9	9		S
Parulidae	Black-throated Green Warbler	*Setophaga virens*	BTNW	29	32	32		S
Passerellidae	Dark-eyed Junco	*Junco hyemalis*	DEJU	97	119	120	3	S
Passerellidae	Swamp Sparrow	*Melospiza georgiana*	SWSP	49	75	75	2	S
Passerellidae	Lincoln's Sparrow	*Melospiza lincolnii*	LISP	80	95	95		S
Passerellidae	Song Sparrow	*Melospiza melodia*	SOSP	22	24	25		S
Passerellidae	Clay-colored Sparrow	*Spizella pallida*	CCSP	3	6	6		S
Passerellidae	Chipping Sparrow	*Spizella passerina*	CHSP	165	211	216	2	S
Passerellidae	White-throated Sparrow	*Zonotrichia albicollis*	WTSP	280	527	528	10	S
Pelecanidae	American White Pelican	*Pelecanus erythrorhynchos*	AWPE	2	0	5		X
Phalacrocoracidae	Double-crested Cormorant	*Nannopterum auritum*	DCCO				1	X
Phasianidae	Ruffed Grouse	*Bonasa umbellus*	RUGR	109	116	116	12	S
Phasianidae	Spruce Grouse	*Falcipennis canadensis*	SPGR	1	1	1	2	DD
Phasianidae	Sharp-tailed Grouse	*Tympanuchus phasianellus*	STGR				3	D
Picidae	Northern Flicker	*Colaptes auratus*	NOFL	96	104	110	5	S
Picidae	Downy Woodpecker	*Dryobates pubescens*	DOWO	5	5	5	1	S
Picidae	Hairy Woodpecker	*Dryobates villosus*	HAWO	7	7	7	2	S
Picidae	Pileated Woodpecker	*Dryocopus pileatus*	PIWO	25	22	25	2	S
Picidae	Black-backed Woodpecker	*Picoides arcticus*	BBWO				2	H

Family	Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Point Counts	Total # Observed (Plot + Flyover)	# on other surveys or incidental obs.	Highest Nesting Evidence
Picidae	American Three-toed Woodpecker	*Picoides dorsalis*	ATTW	2	3	3		H
Picidae	Yellow-bellied Sapsucker	*Sphyrapicus varius*	YBSA	29	30	30	1	S
Podicipedidae	Red-necked Grebe	*Podiceps grisegena*	RNGR				1	X
Rallidae	Yellow Rail	*Coturnicops noveboracensis*	YERA	1	1	1		S
Rallidae	Sora	*Porzana carolina*	SORA	1	2	2	2	S
Rallidae	Virginia Rail	*Rallus limicola*	VIRA				2	S
Regulidae	Ruby-crowned Kinglet	*Regulus calendula*	RCKI	244	328	328	1	S
Regulidae	Golden-crowned Kinglet	*Regulus satrapa*	GCKI	110	130	130		S
Scolopacidae	Spotted Sandpiper	*Actitis macularius*	SPSA	1	0	1		H
Scolopacidae	Wilson's Snipe	*Gallinago delicata*	WISN	51	73	75	7	S
Scolopacidae	Common Snipe	*Gallinago gallinago*	COSN	23	28	28		S
Scolopacidae	American Woodcock	*Scolopax minor*	AMWO				13	S
Scolopacidae	Greater Yellowlegs	*Tringa melanoleuca*	GRYE	8	8	8	1	P
Scolopacidae	Solitary Sandpiper	*Tringa solitaria*	SOSA	1	0	1	1	H
Sittidae	Red-breasted Nuthatch	*Sitta canadensis*	RBNU	111	126	126	3	S
Strigidae	Northern Saw-whet Owl	*Aegolius acadicus*	NSWO				3	S
Strigidae	Boreal Owl	*Aegolius funereus*	BOOW				6	S
Strigidae	Short-eared Owl	*Asio flammeus*	SEOW				1	X
Strigidae	Great Horned Owl	*Bubo virginianus*	GHOW				2	S
Strigidae	Great Gray Owl	*Strix nebulosa*	GGOW	1	1	1	2	S
Strigidae	Barred Owl	*Strix varia*	BADO				1	S
Strigidae	Northern Hawk Owl	*Surnia ulula*	NHOW	1	1	1		S
Sturnidae	European Starling	*Sturnus vulgaris*	EUST	1	1	1		H
Trochilidae	Ruby-throated Hummingbird	*Archilochus colubris*	RTHU	1	1	1	1	H
Troglodytidae	Sedge Wren	*Cistothorus platensis*	SEWR	2	4	4	1	S
Troglodytidae	Winter Wren	*Troglodytes hiemalis*	WIWR	81	89	89	1	S
Turdidae	Veery	*Catharus fuscescens*	VEER	17	18	18		S
Turdidae	Hermit Thrush	*Catharus guttatus*	HETH	146	194	194	8	S
Turdidae	Swainson's Thrush	*Catharus ustulatus*	SWTH	95	119	119	3	S
Turdidae	Townsend's Solitaire	*Myadestes townsendi*	TOSO				1	X
Turdidae	Eastern Bluebird	*Sialia sialis*	EABL				1	H
Turdidae	American Robin	*Turdus migratorius*	AMRO	76	92	95		S
Tyrannidae	Olive-sided Flycatcher	*Contopus cooperi*	OSFL	21	24	24	2	S
Tyrannidae	Eastern Wood-Pewee	*Contopus virens*	EAWP	1	1	1		S

Family	Common Name	Scientific Name	Species Code	# Morning Point Counts	Total # Individuals on Point Counts	Total # Observed (Plot + Flyover)	# on other surveys or incidental obs.	Highest Nesting Evidence
Tyrannidae	Alder Flycatcher	*Empidonax alnorum*	ALFL	100	168	168		S
Tyrannidae	Yellow-bellied Flycatcher	*Empidonax flaviventris*	YBFL	70	85	85		S
Tyrannidae	Least Flycatcher	*Empidonax minimus*	LEFL	81	139	139	1	S
Tyrannidae	Eastern Kingbird	*Tyrannus tyrannus*	EAKI	4	1	5		S
Vireonidae	Red-eyed Vireo	*Vireo olivaceus*	REVI	242	397	400	1	S
Vireonidae	Philadelphia Vireo	*Vireo philadelphicus*	PHVI	35	35	35		S
Vireonidae	Blue-headed Vireo	*Vireo solitarius*	BHVI	22	24	24		S

Appendix 31. Morning point count data for the Great Bear Project, June-July 2022-2023.

Raw data have been compiled for 1092 point counts conducted in June-July, 2022-2023. Plot details and bird data will be provided as a digital addendum in the final report but are not included here due to size (i.e., 200+ pages).

Appendix 32. Birds detected on GBR trail cameras, 2021-2024.

Taxon	Total # of Events	Total # of Individuals	Total # of Photos
Mallard	90	147	869
Canada Jay	54	54	135
Common Raven	45	50	146
unknown duck	36	103	808
unknown bird	31	32	67
Sharp-tailed Grouse	29	34	40
Ruffed Grouse	26	28	106
Broad-winged Hawk	16	16	36
Northern Flicker	12	12	41
Green-winged Teal	8	14	33
American Robin	7	8	13
Great Blue Heron	7	7	154
Northern Harrier	6	6	7
Bald Eagle	5	6	32
Blue Jay	5	5	12
Trumpeter Swan	5	14	86
unknown owl	5	5	10
Red-tailed Hawk	4	4	6
Wood Duck	4	4	18
American Crow	3	4	7
Belted Kingfisher	3	3	7
unknown ducks	3	10	3
Canada Goose	2	4	6
Crow or Raven	2	2	5
Great Gray Owl	2	2	5
Greater Yellowlegs	2	5	5
unknown grouse	2	2	9
unknown raptor	2	2	6
Black-capped Chickadee	1	1	2
Bufflehead	1	1	1
Double-crested Cormorant	1	1	3
Eastern Bluebird	1	1	2
Great Horned Owl	1	1	3
Hairy Woodpecker	1	1	1
Merlin	1	1	2
Pine Grosbeak	1	1	3
Pine Siskin	1	1	3
Redpoll	1	1	1
Ring-necked Duck	1	2	2
Short-eared Owl	1	1	3
Spotted Sandpiper	1	1	6
Swainson's Thrush	1	1	3
Turkey Vulture	1	1	2
unknown swallow	1	1	2

Appendix 33. Predicted densities of 96 forest bird species in the GBR Property.

Family	Common Name	Species Code	PIF Priority Species BCR 8	Total # of Individuals	Total # PCs	Detection Distance (m) Category (DD)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Land area (ha) of GBR Property (ha)	Total # Birds on Property
Tyrannidae	Alder Flycatcher	ALFL	Y	259	495	125	2	1.322233	4.9	2429.8	684.9	0.28188	8612	2427.5
Corvidae	American Crow	AMCR		104	495	400	1.75	1.664332	50.3	24881.4	302.9	0.01217	8612	104.8
Fringillidae	American Goldfinch	AMGO		18	495	125	1.25	1.365214	4.9	2429.8	30.7	0.01264	8612	108.9
Falconidae	American Kestrel	AMKE		12	495	200	1.25	1.337034	12.6	6220.3	20.1	0.00322	8612	27.8
Parulidae	American Redstart	AMRE		30	495	100	2	1.084550	3.1	1555.1	65.1	0.04185	8612	360.4
Turdidae	American Robin	AMRO		104	495	200	2	2.263292	12.6	6220.3	470.8	0.07568	8612	651.8
Picidae	American Three-toed Woodpecker	ATTW		5	495	125	1.5	1.261012	4.9	2429.8	9.5	0.00389	8612	33.5
Accipitridae	Bald Eagle	BAEA	Y	20	495	300	1.25	1.701392	28.3	13995.8	42.5	0.00304	8612	26.2
Hirundinidae	Bank Swallow	BANS	Y	13	495	200	1	1.901263	12.6	6220.3	24.7	0.00397	8612	34.2
Hirundinidae	Barn Swallow	BARS	Y	0	495	200	1.5	1.334036	12.6	6220.3	0.0	0.00000	8612	0.0
Parulidae	Bay-breasted Warbler	BBWA	Y	5	495	80	2	1.166094	2.0	995.3	11.7	0.01172	8612	100.9
Alcedinidae	Belted Kingfisher	BEKI	Y	26	495	200	2	1.336939	12.6	6220.3	69.5	0.01118	8612	96.3
Parulidae	Black-and-white Warbler	BAWW	Y	55	495	100	2	1.165120	3.1	1555.1	128.2	0.08242	8612	709.8
Picidae	Black-backed Woodpecker	BBWO	Y	2	495	125	1.5	1.533022	4.9	2429.8	4.6	0.00189	8612	16.3
Cuculidae	Black-billed Cuckoo	BBCU		4	495	200	2	1.327335	12.6	6220.3	10.6	0.00171	8612	14.7
Parulidae	Blackburnian Warbler	BLBW	Y	71	495	80	2	1.210989	2.0	995.3	172.0	0.17278	8612	1488.0
Paridae	Black-capped Chickadee	BCCH		129	495	125	2	1.460254	4.9	2429.8	376.7	0.15505	8612	1335.3
Parulidae	Black-throated Blue Warbler	BTBW		0	495	125	2	1.131714	4.9	2429.8	0.0	0.00000	8612	0.0
Parulidae	Black-throated Green Warbler	BTNW	Y	26	495	125	2	1.130919	4.9	2429.8	58.8	0.02420	8612	208.4
Corvidae	Blue Jay	BLJA		170	495	200	1.25	1.216784	12.6	6220.3	258.6	0.04157	8612	358.0
Vireonidae	Blue-headed Vireo	BHVI	Y	36	495	125	2	1.211347	4.9	2429.8	87.2	0.03589	8612	309.1
Paridae	Boreal Chickadee	BOCH		21	495	80	1.25	1.131571	2.0	995.3	29.7	0.02985	8612	257.0
Accipitridae	Broad-winged Hawk	BWHA		20	495	125	2	2.518905	4.9	2429.8	100.8	0.04147	8612	357.1
Certhiidae	Brown Creeper	BRCR		16	495	80	2	1.387885	2.0	995.3	44.4	0.04462	8612	384.3
Corvidae	Canada Jay	CAJA		122	495	125	1	1.228846	4.9	2429.8	149.9	0.06170	8612	531.4
Parulidae	Canada Warbler	CAWA	Y	14	495	100	2	1.155460	3.1	1555.1	32.4	0.02080	8612	179.2
Parulidae	Cape May Warbler	CMWA	Y	9	495	80	2	1.385128	2.0	995.3	24.9	0.02505	8612	215.7
Bombycillidae	Cedar Waxwing	CEDW		110	495	100	1.75	1.285804	3.1	1555.1	247.5	0.15917	8612	1370.7
Parulidae	Chestnut-sided Warbler	CSWA	Y	161	495	125	2	1.231096	4.9	2429.8	396.4	0.16314	8612	1405.0
Passerellidae	Chipping Sparrow	CHSP		315	495	125	2	2.004257	4.9	2429.8	1262.7	0.51966	8612	4475.3
Passerellidae	Clay-colored Sparrow	CCSP		9	495	125	2	1.490621	4.9	2429.8	26.8	0.01104	8612	95.1
Icteridae	Common Grackle	COGR		16	495	200	1.25	1.504447	12.6	6220.3	30.1	0.00484	8612	41.7
Caprimulgidae	Common Nighthawk	CONI		2	495	300	2	8.589550	28.3	13995.8	34.4	0.00245	8612	21.1

Family	Common Name	Species Code	PIF Priority Species BCR 8	Total # of Individuals	Total # PCs	Detection Distance (m) Category (DD)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Land area (ha) of GBR Property (ha)	Total # Birds on Property
Corvidae	Common Raven	CORA		198	495	400	1	1.381124	50.3	24881.4	273.5	0.01099	8612	94.7
Parulidae	Common Yellowthroat	COYE		139	495	125	2	1.110819	4.9	2429.8	308.8	0.12709	8612	1094.5
Parulidae	Connecticut Warbler	CONW	Y	15	495	125	2	1.286333	4.9	2429.8	38.6	0.01588	8612	136.8
Passerellidae	Dark-eyed Junco	DEJU		162	495	125	2	1.718786	4.9	2429.8	556.9	0.22919	8612	1973.8
Picidae	Downy Woodpecker	DOWO		6	495	125	2	1.346871	4.9	2429.8	16.2	0.00665	8612	57.3
Tyrannidae	Eastern Kingbird	EAKI	Y	1	495	125	1.75	1.155546	4.9	2429.8	2.0	0.00083	8612	7.2
Tyrannidae	Eastern Phoebe	EAPH		1	495	125	2	2.455063	4.9	2429.8	4.9	0.00202	8612	17.4
Tyrannidae	Eastern Wood-Pewee	EAWP		6	495	200	2	1.116588	12.6	6220.3	13.4	0.00215	8612	18.6
Fringillidae	Evening Grosbeak	EVGR	Y	5	495	125	1.75	1.286942	4.9	2429.8	11.3	0.00463	8612	39.9
Regulidae	Golden-crowned Kinglet	GCKI		213	495	50	2	1.220999	0.8	388.8	520.1	1.33792	8612	11522.2
Strigidae	Great Gray Owl	GGOW		1	495	200	2	1.656005	12.6	6220.3	3.3	0.00053	8612	4.6
Picidae	Hairy Woodpecker	HAWO		16	495	125	2	1.283145	4.9	2429.8	41.1	0.01690	8612	145.5
Turdidae	Hermit Thrush	HETH		379	495	200	2	1.417498	12.6	6220.3	1074.5	0.17273	8612	1487.6
Cardinalidae	Indigo Bunting	INBU		2	495	125	2	1.396566	4.9	2429.8	5.6	0.00230	8612	19.8
Tyrannidae	Least Flycatcher	LEFL		236	495	125	2	1.091003	4.9	2429.8	515.0	0.21193	8612	1825.1
Passerellidae	LeConte's Sparrow	LCSP		3	495	125	2	2.025662	4.9	2429.8	12.2	0.00500	8612	43.1
Passerellidae	Lincoln's Sparrow	LISP		106	495	125	2	1.917185	4.9	2429.8	406.4	0.16727	8612	1440.6
Parulidae	Magnolia Warbler	MAWA	Y	276	495	125	2	1.136815	4.9	2429.8	627.5	0.25826	8612	2224.1
Falconidae	Merlin	MERL		0	495	125	2	1.146159	4.9	2429.8	0.0	0.00000	8612	0.0
Parulidae	Mourning Warbler	MOWA	Y	255	495	125	2	1.296878	4.9	2429.8	661.4	0.27220	8612	2344.2
Parulidae	Nashville Warbler	NAWA	Y	1133	495	125	2	1.238094	4.9	2429.8	2805.5	1.15462	8612	9943.6
Picidae	Northern Flicker	NOFL	Y	133	495	200	1.25	1.300964	12.6	6220.3	216.3	0.03477	8612	299.4
Accipitridae	Northern Harrier	NOHA		1	495	300	2	1.249531	28.3	13995.8	2.5	0.00018	8612	1.5
Strigidae	Northern Hawk Owl	NHOW		1	495	200	2	1.656005	12.6	6220.3	3.3	0.00053	8612	4.6
Parulidae	Northern Parula	NOPA		63	495	100	2	1.180164	3.1	1555.1	148.7	0.09562	8612	823.5
Parulidae	Northern Waterthrush	NOWA		24	495	200	2	1.115121	12.6	6220.3	53.5	0.00860	8612	74.1
Tyrannidae	Olive-sided Flycatcher	OSFL	Y	26	495	300	2	1.115578	28.3	13995.8	58.0	0.00414	8612	35.7
Parulidae	Orange-crowned Warbler	OCWA		4	495	125	2	1.267714	4.9	2429.8	10.1	0.00417	8612	35.9
Pandionidae	Osprey	OSPR		1	495	300	1.25	1.648286	28.3	13995.8	2.1	0.00015	8612	1.3
Parulidae	Ovenbird	OVEN	Y	776	495	200	2	1.239076	12.6	6220.3	1923.0	0.30915	8612	2662.4
Parulidae	Palm Warbler	PAWA		101	495	125	2	1.304109	4.9	2429.8	263.4	0.10842	8612	933.7
Vireonidae	Philadelphia Vireo	PHVI	Y	46	495	125	2	1.196062	4.9	2429.8	110.0	0.04529	8612	390.0
Picidae	Pileated Woodpecker	PIWO		37	495	300	2	1.700753	28.3	13995.8	125.9	0.00899	8612	77.4
Fringillidae	Pine Siskin	PISI		13	495	100	1.5	1.377826	3.1	1555.1	26.9	0.01728	8612	148.8
Fringillidae	Purple Finch	PUFI	Y	29	495	125	2	1.231807	4.9	2429.8	71.4	0.02940	8612	253.2

Family	Common Name	Species Code	PIF Priority Species BCR 8	Total # of Individuals	Total # PCs	Detection Distance (m) Category (DD)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Land area (ha) of GBR Property (ha)	Total # Birds on Property
Fringillidae	Red Crossbill	RECR		1	495	125	1.5	1.401830	4.9	2429.8	2.1	0.00087	8612	7.5
Sittidae	Red-breasted Nuthatch	RBNU		163	495	125	1.75	1.244115	4.9	2429.8	354.9	0.14605	8612	1257.8
Vireonidae	Red-eyed Vireo	REVI		685	495	125	2	1.284682	4.9	2429.8	1760.0	0.72434	8612	6238.0
Accipitridae	Red-tailed Hawk	RTHA		2	495	300	1.25	1.548223	28.3	13995.8	3.9	0.00028	8612	2.4
Icteridae	Red-winged Blackbird	RWBL		97	495	200	1.25	1.342754	12.6	6220.3	162.8	0.02617	8612	225.4
Cardinalidae	Rose-breasted Grosbeak	RBGR		32	495	200	2	1.164252	12.6	6220.3	74.5	0.01198	8612	103.2
Regulidae	Ruby-crowned Kinglet	RCKI	Y	452	495	125	2	1.145504	4.9	2429.8	1035.5	0.42618	8612	3670.2
Trochilidae	Ruby-throated Hummingbird	RTHU		1	495	50	2	1.344624	0.8	388.8	2.7	0.00692	8612	59.6
Phasianidae	Ruffed Grouse	RUGR	Y	125	495	200	2	1.402360	12.6	6220.3	350.6	0.05636	8612	485.4
Icteridae	Rusty Blackbird	RUBL	Y	0	495	125	1.75	1.426944	4.9	2429.8	0.0	0.00000	8612	0.0
Troglodytidae	Sedge Wren	SEWR		11	495	125	2	1.583296	4.9	2429.8	34.8	0.01434	8612	123.5
Accipitridae	Sharp-shinned Hawk	SSHA	Y	2	495	125	2	1.216189	4.9	2429.8	4.9	0.00200	8612	17.2
Passerellidae	Song Sparrow	SOSP		48	495	125	2	1.459175	4.9	2429.8	140.1	0.05765	8612	496.5
Phasianidae	Spruce Grouse	SPGR		1	495	50	2	1.675823	0.8	388.8	3.4	0.00862	8612	74.2
Turdidae	Swainson's Thrush	SWTH		200	495	200	2	1.676065	12.6	6220.3	670.4	0.10778	8612	928.2
Passerellidae	Swamp Sparrow	SWSP	Y	152	495	125	2	1.657741	4.9	2429.8	504.0	0.20740	8612	1786.2
Parulidae	Tennessee Warbler	TEWA	Y	215	495	125	2	1.218880	4.9	2429.8	524.1	0.21570	8612	1857.6
Hirundinidae	Tree Swallow	TRES	Y	5	495	200	1.75	1.145709	12.6	6220.3	10.0	0.00161	8612	13.9
Cathartidae	Turkey Vulture	TUVU		1	495	400	1.75	2.988901	50.3	24881.4	5.2	0.00021	8612	1.8
Turdidae	Veery	VEER		32	495	200	2	1.621988	12.6	6220.3	103.8	0.01669	8612	143.7
Passerellidae	White-throated Sparrow	WTSP		897	495	200	2	2.248338	12.6	6220.3	4033.5	0.64844	8612	5584.4
Fringillidae	White-winged Crossbill	WWCR		4	495	125	1.25	1.371621	4.9	2429.8	6.9	0.00282	8612	24.3
Parulidae	Wilson's Warbler	WIWA		8	495	100	2	1.162681	3.1	1555.1	18.6	0.01196	8612	103.0
Troglodytidae	Winter Wren	WIWR		132	495	200	1.75	1.569247	12.6	6220.3	362.5	0.05828	8612	501.9
Parulidae	Yellow Warbler	YEWA		5	495	125	2	1.106087	4.9	2429.8	11.1	0.00455	8612	39.2
Tyrannidae	Yellow-bellied Flycatcher	YBFL		121	495	125	2	1.197992	4.9	2429.8	289.9	0.11931	8612	1027.5
Picidae	Yellow-bellied Sapsucker	YBSA		37	495	125	1.5	1.657645	4.9	2429.8	92.0	0.03786	8612	326.1
Parulidae	Yellow-rumped Warbler	YRWA		232	495	125	2	1.297116	4.9	2429.8	601.9	0.24770	8612	2133.2

Appendix 34. Owls detected during 2022-2023 in-person nocturnal surveys*.

Date	Location	Station #	Time Start	Easting	Owls	Estimated Direction	Estimated Distance (m)	Field Notes
2022-04-04	Hwy 105	1	20:43	465367	NSOW			
2022-04-04	Tote Road	3	21:07	463832	BOOW			
2022-04-04	Tote Road	4	21:18	463619	BOOW			
2022-04-04	Tote Road	5	21:29	463982	BDOW			
2022-04-04	Tote Road	6	21:48	463180	GHOW			
2022-04-04	Hwy 105	8	22:34	460967	BOOW			
2022-05-06	Loop Road	10	23:11	455731	GHOW, NSWO	WNW	200-500	all time periods
2022-05-06	Loop Road	11	23:23	455575	NSWO	NW	500-1000	all time periods
2022-05-07	Hwy 105	1	21:15	464983	BOOW	S	500-1000	heard after GGOW callback
2022-05-07	Tote Road	2	21:59	464214	BOOW	S	200-500	all time periods
2022-05-07	Tote Road	3	22:09	463858	BOOW	E	200-500	all time periods
2022-06-10	Hwy 105	22	00:28	454649	GGOW			
2022-06-10	Hwy 105	23	00:37	453217	GGOW	N	250	
2023-07-05	Tote Road	3	22:54	463918	GHOW, NSWO	S	>500m	

*only survey stations with owls detected presented here

BOOW = boreal owl; BDOW = barred owl; GHOW = great-horned owl; GGOW = great grey owl; NSOW = northern saw-whet owl

Appendix 35. Owls detected on autonomous recording units (ARUs) deployed June-July 2022-2023*

ARU Deployment	Easting	Northing	Recording Date	Recording Time	Species	# Ind.	Distance Code
Micro 12a	481027	5612215	2022-07-07	22:29	BDOW	1	50m+
Micro 14a	473736	5619903	2022-06-13	22:25	NSWO	1	50m+
Micro 14a	473736	5619903	2022-06-16	23:26	NSWO	1	50m+
Mini Bat 14b	465066	5633873	2023-06-10	23:27	BDOW	1	50m+

*for nightjars and marsh birds primarily*only deployments with owls detected presented here

BOOW = boreal owl; BDOW = barred owl; GHOW = great-horned owl; GGOW = great grey owl; NSOW = northern saw-whet owl

Appendix 36. Results of 2021-2023 waterfowl surveys in the GBR Project landscape.

#	Date	Survey Code	Location	Total Water-fowl	AMWI	BUFF	BWTE	CANG	CCGO	COLO	COGO	COME	GWTE	HOME	HOGR	MALL	NOPI	PBGR	RNDU	RNGR	LESC / GRSC	SNGE	TRUS	WODU	WWSC	Unknown Ducks	Notes (e.g. non-waterfowl spp.)
1	2021-10-13	BS	Rice Lake (WB06)	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	mainly scaup spp. and RNDU
2	2022-05-09	SS	Teardrop Lake (WB01)	60	0	0	0	0	0	0	6	0	0	0	0	6	0	0	48	0	0	0	0	0	0	0	0	
3	2022-06-07	SS	Teardrop Lake (WB01)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	6 pairs
4	2022-06-07	SS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	2022-06-13	BS	Rice Lake (WB06)	6	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	
6	2022-07-04	CS	Waterbody WB07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	2022-07-07	SS	Teardrop Lake (WB01)	7	0	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	
8	2022-07-07	SS	Waterbody WB02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	2022-07-08	SS	Genesee Lake trib	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	none, Tw1.8
10	2022-07-08	SS	Gullrock Lake	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	
11	2022-07-08	SS	GullRock Lake	9	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	1	0	0	3	0	0	0	0	
12	2022-07-08	SS	Stone Creek	7	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	SACR (1) as well
13	2022-07-08	SS	Teardrop Lake (WB01)	30	0	0	0	0	0	0	0	0	0	0	0	4	0	0	26	0	0	0	0	0	0	0	0	also unknown shorebirds in flight
14	2022-07-08	SS	Waterbody WB07	9	0	0	0	0	0	0	0	0	0	0	0	5	0	0	4	0	0	0	0	0	0	0	0	
15	2022-07-09	SS	Dixie Creek at Tote Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None observed, water very high
16	2022-08-22	SS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	2022-08-22	SS	Teardrop Lake (WB01)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	possible BLDU
18	2022-08-23	CS	Teardrop Lake (WB01)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	NOHA
19	2022-08-24	CS	Teardrop Lake (WB01)	7	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	
20	2022-08-25	SS	Rice Lake (WB06)	22	0	0	0	0	0	1	2	0	1	0	0	13	0	0	3	0	0	0	2	0	0	0	MERL, COTE (2) as well; cow and bull moose swimming

#	Date	Survey Code	Location	Total Water-fowl	AMWI	BUFF	BWTE	CANG	CCGO	COLO	COGO	COME	GWTE	HOME	HOGR	MALL	NOPI	PBGR	RNDU	RNGR	LESC / GRSC	SNGE	TRUS	WODU	WWSC	Unknown Ducks	Notes (e.g. non-waterfowl spp.)
21	2022-09-05	CS	Teardrop Lake (WB01)	95	0	0	0	15	0	0	0	0	0	0	0	70	0	0	8	0	0	0	0	2	0	0	
22	2022-09-05	SS	Rice Lake (WB06)	57	0	0	0	0	0	1	4	0	0	0	0	12	0	0	5	0	0	0	0	0	0	35	one mallard was in flight, the rest were sitting.
23	2022-09-05	SS	Rice Lake (WB06)	75	0	0	0	1	0	0	5	0	0	1	0	37	0	0	27	0	0	0	2	2	0	0	BAEA hunting over ducks
24	2022-09-06	CS	Teardrop Lake (WB01)	210	0	0	0	26	0	0	0	0	0	0	0	159	0	0	2	0	0	0	0	21	0	2	
25	2022-09-06	SS	Rice Lake (WB06)	75	2	0	1	5	0	0	27	0	0	2	0	17	0	0	10	0	0	0	0	2	0	9	Juv. BAEA perched in tree
26	2022-09-06	SS	Rice Lake (WB06)	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	74	Unknown ducks are a mix of MALL, COGO, RNDU
27	2022-09-07	CS	Teardrop Lake (WB01)	24	0	0	7	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	
28	2022-09-07	SS	Rice Lake (WB06)	64	0	0	0	0	0	1	3	0	0	0	0	5	0	0	8	0	0	0	0	0	0	47	Unknown ducks are a mix of COGO and RNDU
29	2022-09-21	SS	Rice Lake (WB06)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Juv. BAEA hunting RNDU-unsuccessful, 2 skanes est total 200 of SNGE flying SW, waves on lake and glare made for difficult conditions
30	2022-09-22	CS	Teardrop Lake (WB01)	577	0	0	22	50	0	0	0	0	0	0	0	100	50	0	268	0	0	0	3	22	0	62	50 SNGO flying E not associated with Teardrop.
31	2022-09-22	SS	Rice Lake (WB06)	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
32	2022-09-23	CS	Teardrop Lake (WB01)	176	0	0	42	12	0	0	0	0	0	0	0	21	21	0	70	0	0	7	0	3	0	0	~2130 SNGO seen flying over site to W-WNW, an additional 720 SNGO seen flying W from main drill pad area.
33	2022-09-23	SS	Rice Lake (WB06)	55	0	0	0	0	0	2	4	0	0	0	0	4	0	0	1	0	0	0	2	0	0	42	Unknown ducks probably family groups of COGO or COME- on far side of lake
34	2022-09-23	SS	Rice Lake (WB06)	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	190 SNGE flying to E not associated with Rice L., MALL heard but not seen-may have been in creek, 3 BAEA perched and flying around lake - hunting?
35	2022-09-24	CS	Teardrop Lake (WB01)	106	0	0	27	46	0	0	0	0	0	0	0	1	3	0	0	0	0	0	3	26	0	0	SACR (3) as well
36	2022-10-05	CS	Teardrop Lake (WB01)	160	0	0	6	10	0	0	0	0	1	0	0	139	1	0	0	0	0	0	0	3	0	0	
37	2022-10-05	SS	Rice Lake (WB06)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	1	
38	2022-10-06	CS	Teardrop Lake (WB01)	92	0	0	7	0	0	0	0	0	0	1	0	78	1	0	4	0	0	0	0	1	0	0	
39	2022-10-06	SS	Rice Lake (WB06)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	~180 SNGE migrating overhead

#	Date	Survey Code	Location	Total Water-fowl	AMWI	BUFF	BWTE	CANG	CCGO	COLO	COGO	COME	GWTE	HOME	HOGR	MALL	NOPI	PBGR	RNDU	RNGR	LESC / GRSC	SNGE	TRUS	WODU	WWSC	Unknown Ducks	Notes (e.g. non-waterfowl spp.)
40	2023-05-15	SS	Rice Lake (WB06)	20	0	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	15	difficult survey conditions due to wind
41	2023-05-15	SS	Teardrop Lake (WB01)	15	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	8	0	0	0	0	0	0	BLJA, BWHA, CORA, RBNU, RCKI, WISN, WTSP, YRWA
41	2023-05-16	AS	Dixie Creek	26	2	0	0	0	0	0	3	0	5	6	0	6	0	0	2	0	0	0	0	0	0	2	NOHA
41	2023-05-16	AS	Dixie Lake	14	0	0	0	3	0	0	2	0	0	6	0	0	0	0	0	0	0	0	2	1	0	0	
41	2023-05-16	AS	Genesee Lake	11	0	0	0	0	0	2	2	3	0	0	0	0	0	0	2	0	0	0	0	1	1	0	BAEA, BWHA, TUVU
41	2023-05-16	AS	Rice Lake (WB06)	70	0	49	0	0	0	0	5	1	2	0	0	1	0	0	12	0	0	0	0	0	0	0	
41	2023-05-16	AS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	KILL
41	2023-05-16	AS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no waterfowl observed at 15:38
41	2023-05-16	AS	Waterbody WB03	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
41	2023-05-16	AS	Waterbody WB04	16	0	0	0	2	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	3	0	0	BWHA
41	2023-05-16	AS	Waterbody WB07	4	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	BEKI, BOGU (2)
42	2023-05-16	SS	Rice Lake (WB06)	76	0	61	0	0	0	3	5	0	0	0	0	1	0	0	5	1	0	0	0	0	0	0	BAEA (3), BLJA, NOHA, RUGR, RWBL (3), WTSP
43	2023-05-16	SS	Teardrop Lake (WB01)	14	0	0	0	0	0	2	0	0	0	0	0	1	0	0	11	0	0	0	0	0	0	0	
44	2023-05-17	SS	Rice Lake (WB06)	40	0	20	0	4	0	4	7	0	0	0	0	3	0	0	0	0	0	0	2	0	0	0	
45	2023-05-17	SS	Teardrop Lake (WB01)	27	2	0	0	2	0	0	0	0	0	0	0	4	0	0	17	0	0	0	2	0	0	0	SACR flyby
46	2023-05-18	SS	Rice Lake (WB06)	41	0	9	0	0	0	2	4	2	1	2	0	0	0	0	11	0	0	0	10	0	0	0	BAEA, BOGU (3), RBGU, SPSA
47	2023-05-18	SS	Teardrop Lake (WB01)	16	0	0	0	0	0	0	0	0	0	0	0	1	0	0	15	0	0	0	0	0	0	0	
48	2023-05-19	SS	Rice Lake (WB06)	38	0	6	0	0	0	2	5	0	1	0	0	3	0	0	8	0	0	0	3	0	0	10	NOHA
49	2023-05-19	SS	Teardrop Lake (WB01)	23	0	0	0	0	0	0	0	0	0	0	0	3	0	0	17	0	0	0	3	0	0	0	
50	2023-06-02	CS	Teardrop Lake (WB01)	65	1	0	0	50	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	10	unknown ducks flew over, never landed
51	2023-06-02	SS	Waterbody WB02	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	GRYE,2 SPSA
52	2023-06-10	SS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

#	Date	Survey Code	Location	Total Water-fowl	AMWI	BUFF	BWTE	CANG	CCGO	COLO	COGO	COME	GWTE	HOME	HOGR	MALL	NOPI	PBGR	RNDU	RNGR	LESC / GRSC	SNGE	TRUS	WODU	WWSC	Unknown Ducks	Notes (e.g. non-waterfowl spp.)
53	2023-06-10	SS	Waterbody WB02	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
54	2023-07-06	CS	Waterbody WB07	5	0	0	0	0	0	1	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	HOME (4 FY); MALL (12 FY); BOGU (12 ad., 9 FY)
55	2023-07-08	BS	Rice Lake (WB06)	85	0	0	0	0	0	0	65	0	0	0	0	5	0	0	6	0	0	0	0	0	0	9	2 BOGU
56	2023-08-19	SS	Teardrop Lake (WB01)	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 SORA
57	2023-08-19	SS	Waterbody WB07	13	0	0	0	0	0	1	0	0	0	0	0	9	0	2	1	0	0	0	0	0	0	0	COLO w FY
58	2023-09-05	AS	#1 W of Boyden Lake	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	
58	2023-09-05	AS	#2 Bug River area	55	0	0	0	0	0	0	7	0	0	0	0	12	0	0	18	0	0	0	0	0	0	18	
58	2023-09-05	AS	#3 Stone Creek area	6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	incl. pair of TRUS + 1 fledged young
58	2023-09-05	AS	#4 SW of Dixie Road	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	BAEA
58	2023-09-05	AS	#5 upper Dixie Creek	44	0	0	1	0	0	0	0	0	0	0	0	19	0	0	15	0	0	0	2	7	0	0	
58	2023-09-05	AS	#6 S of Tote Road	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	20	incl. pair of TRUS + 1 fledged young
58	2023-09-05	AS	#7 upper Chukuni River	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0	2	BAEA (2)
58	2023-09-05	AS	Dixie Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	BAEA
58	2023-09-05	AS	Highwall Lake	23	0	0	0	0	0	0	0	0	0	0	0	7	0	0	12	0	0	0	4	0	0	0	incl. pair of TRUS + 2 fledged young; 12 unidentified shorebirds
58	2023-09-05	AS	Rice Lake (WB06)	255	10	0	0	180	0	0	0	0	0	0	0	20	0	0	45	0	0	0	0	0	0	0	BAEA (2)
58	2023-09-05	AS	Teardrop Lake (WB01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
58	2023-09-05	AS	Waterbody WB07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
58	2023-09-05	AS	Waterbody WB08	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
59	2023-09-05	SS	Rice Lake (WB06)	283	0	0	0	83	0	0	9	0	0	0	3	23	0	0	160	0	0	0	0	1	0	0	4	BAEA, NOHA; heavy rain prior to but not during survey
60	2023-09-06	CS	Teardrop Lake (WB01)	59	0	0	8	0	0	0	0	0	3	0	0	43	0	0	0	0	0	0	0	5	0	0	flyover of ~200 CANG, 18 SACR; also CORA, MERL, SSHA;
61	2023-09-06	CS	Teardrop Lake (WB01)	63	0	0	0	60	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	observed during wild rice survey; 62 SACR and ~1000 CANG were flyovers; also BLJA, BAEA (2), CAJA (4), CORA (4), MERL NOHA (2), SORA, SSHA

#	Date	Survey Code	Location	Total Water-fowl	AMWI	BUFF	BWTE	CANG	CCGO	COLO	COGO	COME	GWTE	HOME	HOGR	MALL	NOPI	PBGR	RNDU	RNGR	LESC / GRSC	SNGE	TRUS	WODU	WWSC	Unknown Ducks	Notes (e.g. non-waterfowl spp.)
62	2023-09-06	SS	Rice Lake (WB06)	179	0	0	2	135	5	0	2	0	0	0	7	13	0	0	0	0	0	0	0	0	0	15	
63	2023-09-07	BS	Rice Lake (WB06)	217	1	0	14	150	0	0	2	0	0	0	5	45	0	0	0	0	0	0	0	0	0	0	observed during wild rice survey; also BAEA (2), RBGU (2), SORA
64	2023-09-07	CS	Teardrop Lake (WB01)	74	0	0	0	0	0	0	0	0	0	0	0	74	0	0	0	0	0	0	0	0	0	0	
65	2023-09-25	SS	Rice Lake (WB06)	188	0	0	0	80	0	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	1	0	100	BAEA, BEKI, BCCH (2), PISI (45), RTHA
66	2023-09-26	CS	Teardrop Lake (WB01)	117	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0	0	RUBL (2)
67	2023-09-27	BS	Dixie Creek	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	BEKI, MAKE, STGR (3), WISN (3); also beaver swimming
68	2023-09-27	SS	Rice Lake (WB06)	100	0	7	0	24	27	0	0	0	11	0	4	1	0	1	0	0	15	0	0	0	0	10	HERG, PAWA, PISI (10), RCKI, WTSP
69	2023-09-28	CS	Teardrop Lake (WB01)	40	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	

*AH = Al Harris; AS = Ashley Spenceley; BR = Brian Ratcliff; EM = Emily Meek; LG = Luke Giroux; LS = Lindsay Spenceley; RF = Rob Foster

Appendix 37. Potential* and confirmed amphibian and reptile species for the Great Bear Project AOI.

Family	Common Name	Scientific Name	Great Bear Status	Notes
Bufonidae	American Toad	*Anaxyrus americanus*	confirmed	Common and widespread in Great Bear AOI
Hylidae	Gray Treefrog	*Hyla versicolor*	confirmed	Common and widespread in Great Bear AOI
Hylidae	Spring Peeper	*Pseudacris crucifer*	confirmed	Common and widespread in Great Bear AOI
Hylidae	Boreal Chorus Frog	*Pseudacris maculata*	possible	Within broad range and potentially suitable habitat present
Ranidae	Green Frog	*Lithobates clamitans*	possible	Near northern limit of species' range but potentially suitable habitat present
Ranidae	Northern Leopard Frog	*Lithobates pipiens*	confirmed	Observed on Rice Lake
Ranidae	Mink Frog	*Lithobates septentrionalis*	confirmed	Fairly common and widespread in Great Bear AOI
Ranidae	Wood Frog	*Lithobates sylvaticus*	confirmed	Common and widespread in Great Bear AOI
Ambystomatidae	Blue-spotted Salamander	*Ambystoma laterale*	possible	Near northern limit of species' range but potentially suitable habitat present
Colubridae	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	confirmed	Observed at several locations in the Great Bear AOI
Chelydridae	Snapping Turtle	*Chelydra serpentina*	possible	Near northern limit of species' range but potentially suitable habitat present. See *Species at Risk*
Emydidae	Western Painted Turtle	*Chrysemys picta bellii*	confirmed	Observed on several waterbodies and watercourses in Great Bear AOI

*based on Harding (2006), iNat (2020), ORRA (2024), Rowell (2012)

Appendix 38. Results of anuran in-person nocturnal surveys*.

Date	General Location	Station #	Time Start	Easting	Northing	AMTO	GRTF	SPPE	WOFR
2022-05-06	Tuzyk's Road	9	23:01	456579	5633975			X	X
2022-05-07	Hwy 105	1	21:15	464983	5634820			X	X
2022-05-07	Tote Road	2	21:59	464214	5634771			X	X
2022-05-07	Tote Road	3	22:09	463858	5633616			X	X
2022-05-08	Dixie Road N	5	22:00	449598	5638352			X	X
2022-05-08	Dixie Road N	6	22:12	448740	5638331			X	X
2022-05-08	Dixie Road N	7	22:21	448424	5637354			X	X
2022-05-08	Dixie Road N	8	22:28	448221	5636419			X	X
2022-05-08	Dixie Road N	9	22:35	448990	5635917			X	X
2022-05-08	Dixie Road N	10	22:42	449545	5635205			X	X
2022-05-08	Dixie Road N	11	22:49	449682	5634544			X	X
2022-05-08	Hwy 105	1	21:19	457531	5638852			X	X
2022-05-08	Hwy 105	2	21:30	455942	5638554			X	X
2022-05-08	Hwy 105	3	21:40	453921	5638936			X	X
2022-05-08	Hwy 105	4	21:51	451659	5638921			X	X
2022-05-19	Tuzyk's Road	1	21:34	457187	5638271			2	
2022-05-19	Tuzyk's Road	2	21:40	457268	5637764			2	1
2022-05-19	Tuzyk's Road	3	21:46	457070	5637349			3	2
2022-05-19	Tuzyk's Road	4	21:51	456814	5636984			2	1
2022-05-19	Tuzyk's Road	5	21:55	456352	5636808			2	1
2022-05-19	Tuzyk's Road	6	22:00	456198	5636306			2	1
2022-05-19	Tuzyk's Road	7	22:04	455715	5636201			3	2
2022-05-19	Tuzyk's Road	8	22:05	455303	5635899	1		2	1
2022-05-19	Tuzyk's Road	9	22:14	455373	5635496	1		2	1
2022-05-19	Tuzyk's Road	10	22:18	455325	5635016	1		2	2
2022-05-19	Tuzyk's Road	11	22:22	454938	5634756	1		2	1
2022-05-19	Tuzyk's Road	12	22:28	455063	5634311	1		1	1
2022-05-19	Tuzyk's Road	13	22:33	455497	5634098			1	3
2022-05-19	Tuzyk's Road	14	22:38	456012	5634112	1		2	1
2022-05-22	Dixie Road N	14	23:35	448225	5636154			X	X
2022-05-22	Dixie Road N	15	23:42	448234	5636719			X	X
2022-05-22	Dixie Road N	16	23:50	448324	5637197			X	
2022-05-22	Tote Road	1	21:35	462244	5629888			X	X
2022-05-22	Tote Road	2	21:48	462757	5629927			X	X
2022-05-22	Tote Road	3	21:56	463309	5629895			X	X
2022-05-22	Tote Road	4	22:04	463648	5630332			X	X
2022-05-22	Tote Road	5	22:11	463981	5630834			X	X
2022-05-22	Tote Road	6	22:18	463784	5631301			X	X
2022-05-22	Tote Road	7	22:25	463778	5631852			X	X
2022-05-22	Tote Road	8	22:33	463561	5632328			X	X
2022-05-22	Tote Road	9	22:41	463864	5632765			X	X
2022-05-22	Tote Road	10	22:48	463928	5633269			X	X
2022-05-22	Tote Road	11	22:55	463811	5633810			X	X
2022-05-22	Tote Road	12	23:02	464021	5634510			X	X
2022-05-22	Tote Road	13	23:09	464412	5634908			X	X
2022-06-07	Loop Road	1	21:58	456410	5632041		X	X	
2022-06-07	Loop Road	2	22:09	456633	5632917		X	X	
2022-06-07	Loop Road	3	22:21	455903	5633275		X	X	
2022-06-07	Loop Road	4	22:30	456024	5634043		X	X	
2022-06-07	Loop Road	5	22:38	455141	5634266		X	X	
2022-06-07	Loop Road	6	33:46	455266	5634924		X	X	

Date	General Location	Station #	Time Start	Easting	Northing	AMTO	GRTF	SPPE	WOFR
2022-06-07	Loop Road	7	22:53	455207	5635820		X	X	
2022-06-08	Hwy 105	12	23:31	455952	5638520	X		X	
2022-06-08	Hwy 105	14	23:49	451819	5638988	X		X	
2022-06-08	Loop Road	8	23:01	456064	5636255		X	X	
2022-06-08	Loop Road	9	23:08	456676	5636940		X	X	
2022-06-08	Loop Road	10	23:17	457191	5637712			X	
2022-06-08	Loop Road	11	23:24	457195	5638304		X		
2022-06-08	Tote Road	2	22:05	461898	5629784			X	
2022-06-08	Tote Road	3	22:12	462303	5629880			X	
2022-06-08	Tote Road	7	22:37	463874	5630646			X	
2022-06-08	Tote Road	8	22:44	463961	5631117			X	
2022-06-08	Tote Road	9	22:50	463735	5631525	X		X	
2022-06-08	Tote Road	10	22:56	463673	5631984	X		X	
2022-06-09	Dixie Road N	18	00:05	448640	5638573	X		X	
2022-06-09	Dixie Road N	19	00:15	448815	5638093			X	
2022-06-09	Dixie Road N	22	00:35	448232	5636820	X		X	
2022-06-09	Dixie Road N	23	00:41	448207	5636306			X	
2022-06-09	Dixie Road N	24	00:48	448493	5636031	X		X	
2022-06-09	Loop Road	1	22:06	456409	5632048		X	X	
2022-06-09	Loop Road	2	22:13	456382	5632520		X	X	
2022-06-09	Loop Road	3	22:20	456633	5632914		X		
2022-06-09	Loop Road	4	22:27	456377	5633220		X	X	
2022-06-09	Loop Road	6	22:41	455762	5633646		X		
2022-06-09	Loop Road	8	22:55	455628	5634134		X		
2022-06-09	Tote Road	11	23:02	463586	5632378			X	
2022-06-09	Tote Road	15	23:31	463834	5633931			X	
2022-06-09	Tote Road	16	23:38	464023	5634392		X		
2022-06-09	Tote Road	17	23:44	464269	5634832			X	
2022-06-10	Dixie Road N	4	22:42	448480	5636039			X	
2022-06-10	Dixie Road N	5	22:50	448223	5636362	X		X	
2022-06-10	Dixie Road N	6	22:56	448256	5636918	X		X	
2022-06-10	Dixie Road N	26	00:59	448646	5638629	X		X	
2022-06-10	Hwy 105	21	00:20	455960	5638516			X	
2022-06-10	Hwy 105	22	00:28	454649	5638806			X	
2022-06-10	Hwy 105	23	00:37	453217	5638982			X	
2022-06-10	Hwy 105	24	00:45	451817	5638988	X	X	X	
2022-06-10	Hwy 105	25	00:52	450564	5638523		X	X	
2022-06-10	Hwy 105	27	01:08	448177	5639290	X		X	
2022-06-10	Loop Road	9	23:01	455146	5634270		X		
2022-06-10	Loop Road	14	23:35	455628	5636131		X	X	
2022-06-10	Loop Road	15	23:42	456098	5636258		X		
2022-06-10	Loop Road	17	23:53	456678	5636938		X	X	
2022-06-10	Loop Road	18	23:59	456984	5637068		X	X	
2022-06-10	Teardrop Lake	1	21:39	454106	5635088		1	2	
2022-06-10	Teardrop Lake	2	22:03	453996	5635496		1	2	
2022-06-10	Tuzyk's Road	2	22:07	454756	5635131			X	
2022-06-10	Tuzyk's Road	3	22:14	455065	5635524			X	
2022-06-10	WB01	1	22:00	454288	5634899		X	X	
2022-06-11	Dixie Road N	7	23:03	448425	5637349		X	X	
2022-06-11	Dixie Road N	8	23:09	448766	5637657		X	X	
2022-06-11	Dixie Road N	9	23:18	448806	5638123		X	X	
2022-06-11	Rice Lake	2	21:39	459802	5633703		1		
2022-06-11	Tote Road	11	22:01	463518	5632082		X		

Date	General Location	Station #	Time Start	Easting	Northing	AMTO	GRTF	SPPE	WOFR
2022-06-11	Tote Road	13	22:16	462293	5629881		X	X	
2022-06-11	Tote Road	14	22:22	462748	5629926		X	X	
2022-06-11	Tote Road	15	22:30	463251	5629907		X	X	
2022-06-11	Tote Road	17	22:44	463875	5630649			X	
2022-06-11	Tote Road	18	22:50	463975	5631099			X	
2022-06-11	Tote Road	19	22:56	463737	5631523			X	
2022-06-12	Tote Road	20	23:03	463664	5631993	X	X	X	
2022-06-12	Tote Road	27	23:48	464247	5634811		X		
2022-07-02	Dixie Road N	2	21:44	448493	5636031				
2022-07-02	Dixie Road N	3	22:25	448231	5636834	X			
2022-07-02	Dixie Road N	3	21:51	448493	5636031				
2022-07-02	Dixie Road N	4	22:35	448368	5637310	X			
2022-07-02	Dixie Road N	5	22:45	447889	5637222				
2022-07-02	Dixie Road N	7	23:07	448813	5638111	X			
2022-07-02	Loop Road	1	22:01	456376	5632539		X	X	X
2022-07-02	Loop Road	2	22:12	456648	5632956			X	X
2022-07-02	Loop Road	3	22:20	456343	5633220		X	X	X
2022-07-02	Loop Road	4	22:30	455899	5633283		X	X	X
2022-07-02	Loop Road	5	22:38	455775	5633659		X	X	X
2022-07-02	Tuzyk's Road	6	22:47	456009	5634112			X	X
2022-07-02	Tuzyk's Road	7	22:53	455607	5634129			X	X
2022-07-02	Tuzyk's Road	8	23:00	455143	5634272			X	X
2022-07-02	Tuzyk's Road	9	23:08	454939	5634636			X	X
2022-07-02	Tuzyk's Road	10	23:15	455280	5634931	X		X	X
2022-07-02	Tuzyk's Road	11	23:24	455367	5635524	X		X	X
2022-07-02	Tuzyk's Road	12	23:31	455222	5635839	X		X	X
2022-07-02	Tuzyk's Road	13	23:38	455613	5636120	X		X	X
2022-07-02	Tuzyk's Road	14	23:45	456131	5636269	X		X	X
2022-07-02	Tuzyk's Road	15	23:52	456316	5636679	X	X	X	X
2022-07-03	Tote Road	1	22:03	461591	5629300				
2022-07-03	Tuzyk's Road	1	0:07	456981	5637065				

*X denotes present; 1,2,3 as per abundance codes described in methods; only stations with amphibians presented

AMTO = American toad; GTFR = gray tree frog, SPPE = spring peeper, WOFR = wood frog

Appendix 39. Odonate (dragonfly and damselfly) species confirmed in the Great Bear Project AOI.

Family	Common Name	Scientific Name	S_RANK
Aeshnidae	Canada Darner	*Aeshna canadensis*	S5
Aeshnidae	Lake Darner	*Aeshna eremita*	S5
Aeshnidae	Shadow Darner	*Aeshna umbrosa*	S5
Aeshnidae	Common Green Darner	*Anax junius*	S5
Calopterygidae	River Jewelwing	*Calopteryx aequabilis*	S5
Coenagrionidae	Boreal Bluet	*Enallagma boreale*	S5
Coenagrionidae	Eastern Forktail	*Ischnura verticalis*	S5
Coenagrionidae	Sedge Sprite	*Nehalennia irene*	S5
Corduliidae	American Emerald	*Cordulia shurtleffii*	S5
Corduliidae	Spiny Baskettail	*Epitheca spinigera*	S5
Gomphidae	Black-shouldered Spinyleg	*Dromogomphus spinosus*	S5
Gomphidae	Midland Clubtail	*Gomphurus fraternus*	S4
Gomphidae	Cobra Clubtail	*Gomphurus vastus*	S1
Gomphidae	Lancet Clubtail	*Phanogomphus exilis*	S5
Gomphidae	Dusky Clubtail	*Phanogomphus spicatus*	S5
Lestidae	Northern Spreadwing	*Lestes disjunctus*	S5
Libellulidae	Chalk-fronted Corporal	*Ladona julia*	S5
Libellulidae	Hudsonian Whiteface	*Leucorrhinia hudsonica*	S5
Libellulidae	Belted Whiteface	*Leucorrhinia proxima*	S5
Libellulidae	Four-spotted Skimmer	*Libellula quadrimaculata*	S5
Libellulidae	Cherry-faced Meadowhawk	*Sympetrum internum*	S5
Libellulidae	White-faced Meadowhawk	*Sympetrum obtrusum*	S5
Macromiidae	Swift River Cruiser	*Macromia illinoiensis*	S4

Appendix 40. Butterly species confirmed in the Great Bear Project AOI.

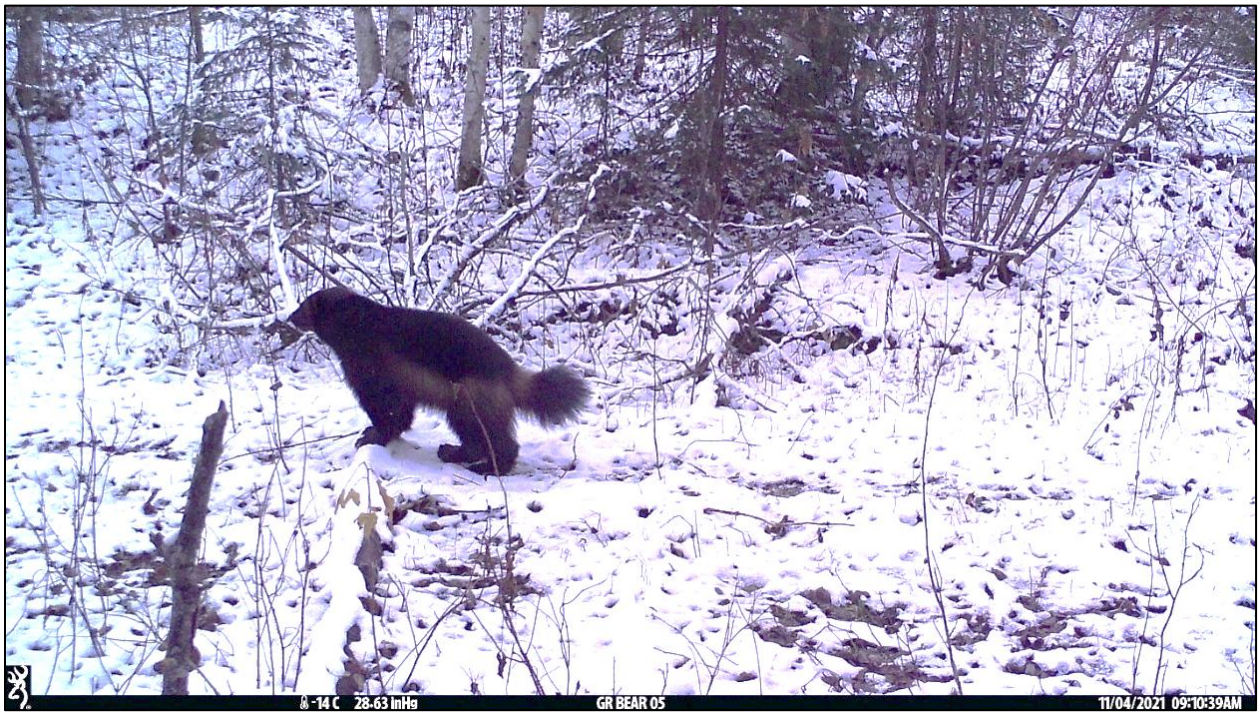
Family	Common Name	Scientific Name	S_RANK	GBR*
Hesperiidae	Common Roadside Skipper	*Amblyscirtes vialis*	S4	Y*
Hesperiidae	Dreamy Duskywing	*Erynnis icelus*	S5	Y
Lycaenidae	Brown Elfin	*Callophrys augustinus*	S5	Y
Lycaenidae	Eastern Pine Elfin	*Callophrys niphon*	S5	Y
Lycaenidae	Hoary Elfin	*Callophrys polios*	S4	Y
Lycaenidae	Northern Spring Azure	*Celastrina lucia*	S5	Y
Lycaenidae	Greenish Blue	*Plebejus saepiolus*	S4	Y*
Nymphalidae	Milbert's Tortoiseshell	*Aglais milberti*	S5	Y
Nymphalidae	Meadow Fritillary	*Boloria bellona*	S5	Y*
Nymphalidae	Arctic Fritillary	*Boloria chariclea*	S4	Y
Nymphalidae	Freija Fritillary	*Boloria freija*	S4	Y
Nymphalidae	Silver-bordered Fritillary	*Boloria selene*	S5	Y
Nymphalidae	Red-disked Alpine	*Erebia discoidalis*	S4	Y
Nymphalidae	White Admiral	*Limenitis arthemis arthemis*	S5	Y
Nymphalidae	Mourning Cloak	*Nymphalis antiopa*	S5	Y
Nymphalidae	Compton Tortoiseshell	*Nymphalis l-album*	S5	Y
Nymphalidae	Northern Crescent	*Phyciodes cocyta*	S5	Y
Nymphalidae	Atlantis Fritillary	*Speyeria atlantis*	S5	Y
Nymphalidae	Red Admiral	*Vanessa atalanta*	S5	Y
Nymphalidae	Painted Lady	*Vanessa cardui*	S5	Y
Papilionidae	Canadian Tiger Swallowtail	*Papilio canadensis*	S5	Y
Pieridae	Orange Sulphur	*Colias eurytheme*	S5	Y
Pieridae	Clouded Sulphur	*Colias philodice*	S5	Y
Pieridae	Cabbage White	*Pieris rapae*	SNA	Y
Pieridae	Western White	*Pontia occidentalis*	S3	Y

* additional species documented in GBR area by the Ontario Butterfly Atlas (Macnaughton et al. 2024).

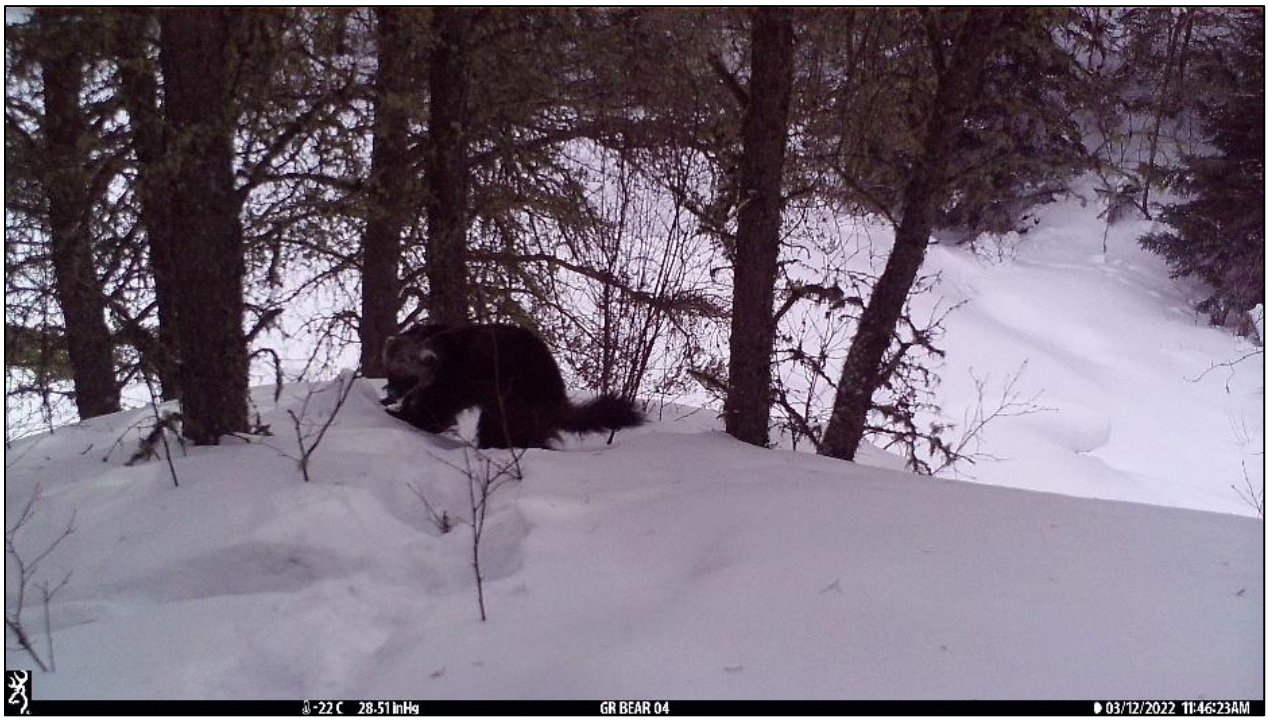
Appendix 41. Wolverine sign/observations at or near the Great Bear Project, 2021-2024.

Evidence	Date	Camera Deployment	Location	Easting	Northing	Photo Time	# Photos	Photo #
run pole photo/ video	2023-02-13	RP2-1a	1.5 km W of WB01 (Teardrop Lake)	452573	5634675	20:07	5	1536-1540
trail camera photo	2023-11-22	TC-003e	near WB04	452867	5636323	7:21	3	566-568
trail camera photo	2021-11-07	TC-004a	on Pj ridge on south side of waterbody WB02	454146	5634674	01:07	1	139
trail camera photo	2022-03-12	TC-004a	on Pj ridge on south side of waterbody WB02	454146	5634674	22:45	6	0164-0169
trail camera photo	2022-03-15	TC-004a	on Pj ridge on south side of waterbody WB02	454146	5634674	13:39	3	0173-0175
trail camera photo	2023-12-14	TC-004b	east of Tote Road between Dixie Cr and ROW	464009	5633784	11:21	2	244-245
trail camera photo	2024-02-23	TC-004b	east of Tote Road between Dixie Cr and ROW	464009	5633784	8:57	2	375-376
trail camera photo	2021-11-04	TC-005a	trail south of WB01 (Teardrop L) on NW side of trail	454106	5634771	07:39	1	66
trail camera photo	2021-11-04	TC-005a	trail south of WB01 (Teardrop L) on NW side of trail	454106	5634771	10:10	2	69-70
trail camera photo	2022-03-14	TC-005a	trail south of WB01 (Teardrop L) on NW side of trail	454106	5634771	22:12	3	0015-0017
trail camera photo	2022-07-23	TC-022a	WB05 west of Tuzyk Road by gravel pits	455751	5636349	5:35	2	5672-5673
trail camera photo	2024-05-11	TC-060a	trail west of WB04	452079	5637131	12:58	3	658-660
trail camera photo	2022-09-14	TC-300a	trail SW of WB01 (Teardrop L)	453792	5633891	14:56	3	463-465
trail camera photo	2022-10-12	TC-301a	on trail on NW shore of WB03 (N of Genesee L.)	450161	5637309	21:42	1	65
trail camera photo	2023-11-22	TC-301c	WB05 west of Tuzyk Road by gravel pits	455756	5636344	15:44	3	55-57
tracks	2021-11-21		Dixie Loop Road	454762	5632101			
tracks	2022-04-04		Tote Road	463818	5630591			
scat	2022-06-05		talus slope west of WB04	451493	5636462			

Appendix 42. Trail camera images of wolverines at or near the Great Bear Project, 2021-2024.



Wolverine on 2021-11-04 along trail south of Waterbody WB01 on trail camera deployment TC-005a.



Wolverine on 2022-03-12 along game trail near Waterbody WB02 on trail camera deployment TC-004a.

Wolverine on 2022-07-23 along shoreline of Waterbody WB05 on trail camera deployment TC-022a.

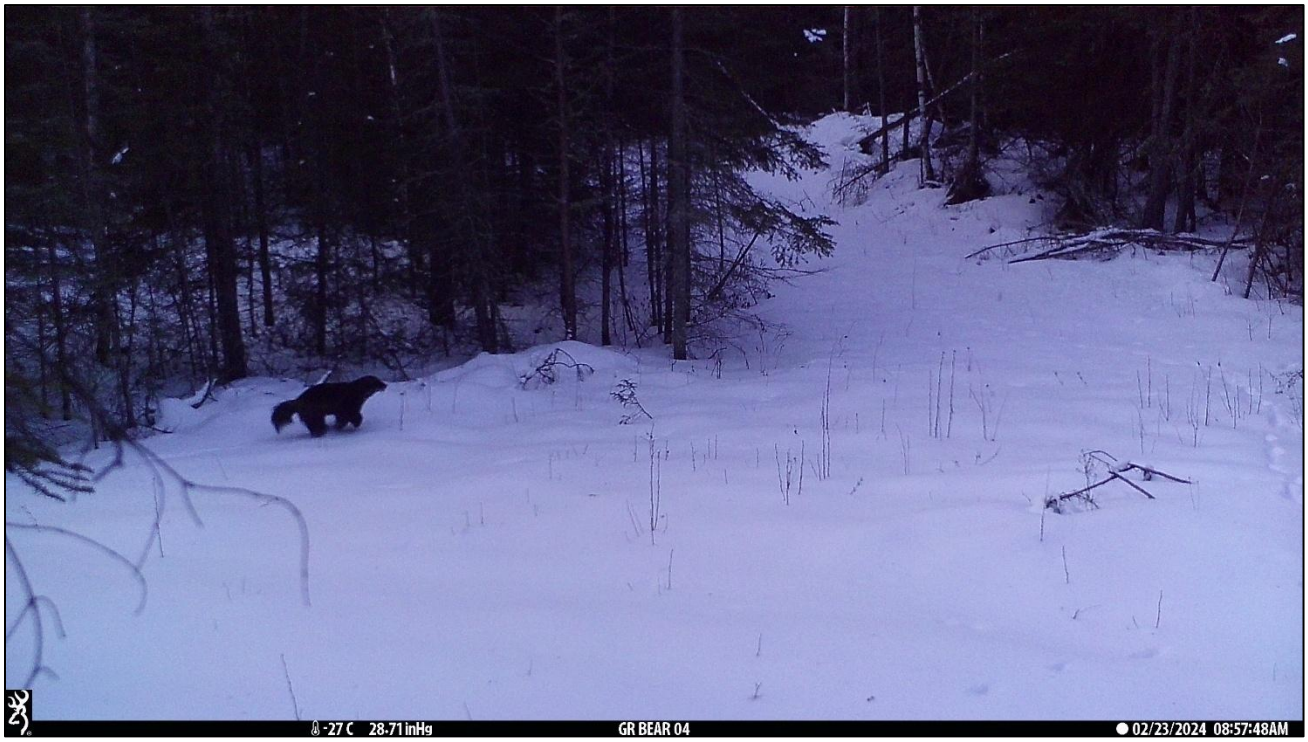
Wolverine on 2022-09-14 along trail south of near Waterbody WB01 on trail camera deployment TC-300a.

Wolverine on 2022-10-12 along game trail near Waterbody WB04 on trail camera deployment TC-301a.

Wolverine on 2023-02-15 at baited Run Pole #2 south of Waterbody WB01.

Wolverine on 2023-11-22 along shoreline of Waterbody WB05 on trail camera deployment TC-310c.

Wolverine on 2023-11-22 along beaver dam near Waterbody WB04 on trail camera deployment TC-003e.



Wolverine on 2024-02-23 along trail east of the Tote Road on trail camera deployment TC-004b.

Wolverine on 2024-05-1 along trail west of Waterbody WB04 on trail camera deployment TC-060a. The individual is a male ear-tagged by WCS, possibly M03 or M27 (M. Scrafford, pers. comm.).

Appendix 43. Eastern whip-poor-will (EWPW) and common nighthawk (CONI) observations during 2022-2023 in-person nightjar surveys*.

Date	Location	Station #	Time Start	Easting	Northing	EWPW	CONI
2022-06-08	Tote Road	2	22:05	461898	5629784		1
2022-06-08	Tote Road	5	22:25	463268	5629896		1
2022-06-09	Dixie Road N	18	00:05	448640	5638573	1	
2022-06-10	Hwy 105	27	01:08	448177	5639290	1	
2022-06-11	Dixie Road N	8	23:09	448766	5637657	1	
2022-06-12	Tote Road	24	23:30	463809	5633738		1
2022-07-02	Loop Road	1	22:01	456376	5632539		1
2022-07-02	Dixie Road N	4	22:35	448368	5637310	1	
2022-07-02	Dixie Road N	5	22:45	447889	5637222	1	
2022-07-02	Dixie Road N	6	22:57	448744	5637648	1	
2022-07-02	Dixie Road N	7	23:07	448813	5638111	1	
2022-07-02	Dixie Road N	8	23:14	448640	5638601	1	
2023-06-03	Tuzyk's Road	1	21:53	457289	5633971		2
2023-06-10	Tuzyk's Road	1	22:04	457297	5633990		2
2023-06-10	Tuzyk's Road	4	22:34	455385	5635313		1
2023-06-10	Dixie Road N	10	23:30	448639	5638576	1	
2023-06-10	Dixie Road N	11	23:38	448809	5638111	1	
2023-06-10	Dixie Road N	12	23:50	448766	5637668	1	
2023-06-10	Dixie Road N	13	23:58	448386	5637325	1	
2023-06-10	Tuzyk's Road	3a	21:31	456473	5636916		1

* only stations with at least one nightjar (i.e., common nighthawk or eastern whip-poor-will) detected are presented here

Appendix 44. Eastern whip-poor-will (EWPW) and common nighthawk (CONI) observations from autonomous recording units (ARUs) deployed 2022-2023*.

ARU Deployment	Easting	Northing	Recording Date	Recording Time	Spp_No	Species	# Ind.	Confidence	Distance Code	Comments
Micro 02b	470636	5622734	2022-06-13	21:30	CONI (2+)	CONI	2	Certain	0-50m	at least 2 CONIs calling simultaneously at different distances, peent and boom
Micro 02b	470636	5622734	2022-06-13	22:30	CONI (2+)	CONI	2	Certain	0-50m	at least 2 CONIs calling simultaneously at different distances
Micro 02b	470636	5622734	2022-06-15	21:30	CONI	CONI	1	Certain	50m+	
Micro 02b	470636	5622734	2022-06-15	22:31	CONI (2+)	CONI	2	Certain	0-50m	at least 2 CONIs calling simultaneously at different distances, booming
Micro 03c	455281	5635470	2023-06-09	22:27	CONI	CONI	1	Certain	50m+	
Micro 07b	449807	5637042	2022-06-13	21:30	EWPW	EWPW	1	Certain	0-50m	
Micro 07b	449807	5637042	2022-06-13	22:30	EWPW	EWPW	1	Certain	50m+	
Micro 07b	449807	5637042	2022-06-13	23:30	EWPW	EWPW	1	Certain	50m+	
Micro 07b	449807	5637042	2022-06-14	22:30	EWPW	EWPW	1	Certain	0-50m	
Micro 07b	449807	5637042	2022-07-07	22:29	EWPW	EWPW	1	Certain	0-50m	
Micro 07b	449807	5637042	2022-07-07	22:29	EWPW	EWPW	1	Certain	50m+	
Micro 07b	449807	5637042	2022-07-07	22:29	EWPW	EWPW	1	Certain	0-50m	
Micro 07b	449807	5637042	2022-07-07	22:29	EWPW	EWPW	1	Certain	0-50m	
Micro 07b	449807	5637042	2022-07-07	22:29	EWPW	EWPW	1	Certain	50m+	
Micro 07c	452620	5634722	2023-06-10	22:28	EWPW	EWPW	1	Certain	50m+	
Micro 08b	464049	5633950	2022-06-13	21:30	CONI	CONI	1	Certain	0-50m	
Micro 08b	464049	5633950	2022-07-07	21:31	CONI	CONI	1	Certain	0-50m	
Micro 08c	464052	5634593	2023-07-03	22:32	CONI	CONI	1	Certain	50m+	
Micro 14b	459151	5636095	2023-06-08	21:27	CONI	CONI	1	Certain	50m+	
Micro 14b	459151	5636095	2023-06-22	21:33	CONI (2+)	CONI	2	Certain	0-50m	multiple CONI peenting and booming, both far and close
Micro 14b	459151	5636095	2023-06-22	23:33	CONI	CONI	1	Certain	50m+	
Micro 14b	459151	5636095	2023-07-03	21:32	CONI	CONI	1	Certain	0-50m	
Micro 15a	460057	5635657	2022-06-13	21:28	CONI	CONI	1	Certain	50m+	
Micro 15a	460057	5635657	2022-06-15	21:30	CONI	CONI	1	Certain	50m+	
Micro 15a	460057	5635657	2022-07-07	21:28	CONI	CONI	1	Certain	50m+	GRTF very faint
Micro 15a	460057	5635657	2022-07-07	21:28	CONI (2+)	CONI	2	Certain	0-50m	two individuals peenting and booming
Micro 15a	460057	5635657	2022-07-07	22:28	CONI	CONI	1	Certain	50m+	GRTF very faint
Micro 15b	460158	5635606	2023-06-09	21:27	CONI	CONI	1	Certain	50m+	
Micro 15b	460158	5635606	2023-07-02	23:32	CONI	CONI	1	Certain	50m+	

ARU Deployment	Easting	Northing	Recording Date	Recording Time	Spp_No	Species	# Ind.	Confidence	Distance Code	Comments
Micro 16a	471801	5621782	2022-06-13	21:27	CONI	CONI	1	Certain	0-50m	
Micro 16b	458538	5636456	2023-06-08	21:26	CONI	CONI	1	Certain	50m+	
Micro 16b	458538	5636456	2023-07-03	21:32	CONI	CONI	1	Certain	50m+	2 CONI peents at once
Micro 16b	458538	5636456	2023-07-05	21:31	CONI	CONI	1	Certain	50m+	
Micro 16b	458538	5636456	2023-07-05	23:31	CONI	CONI	1	Certain	50m+	
Micro 17b	458171	5636673	2023-06-08	21-27	CONI	CONI	1	Certain	50m+	
Micro 17b	458171	5636673	2023-06-23	21:33	CONI	CONI	1	Certain	50m+	
Micro 17b	458171	5636673	2023-07-03	21:32	CONI	CONI	1	Certain	50m+	
Micro 20a	458952	5635504	2023-06-10	21:28	CONI (2+)	CONI	2	Certain	50m+	2-3 separate peents at once
Micro 20a	458952	5635504	2023-06-10	22:28	CONI	CONI	1	Certain	50m+	
Micro 20a	458952	5635504	2023-06-23	22:33	CONI	CONI	1	Certain	50m+	
Micro 20a	458952	5635504	2023-07-03	21:32	CONI	CONI	1	Certain	50m+	2 CONI
Micro 20a	458952	5635504	2023-07-03	22:32	CONI	CONI	1	Certain	50m+	
Mini Bat 02a	455749	5636349	2022-06-13	23:29	CONI	CONI	1	Certain	50m+	
Mini Bat 06b	449063	5636159	2022-06-11	22:28	EWPW	EWPW	1	Certain	50m+	
Mini Bat 06b	449063	5636159	2022-06-11	23:28	EWPW	EWPW	1	Certain	50m+	
Mini Bat 06b	449063	5636159	2022-06-13	22:30	EWPW	EWPW	1	Certain	50m+	EWPW very faint
Mini Bat 06c	457087	5636825	2023-06-03	22:21	CONI	CONI	1	Certain	50m+	
Mini Bat 07a	454536	5637221	2022-06-13	21:30	CONI	CONI	1	Certain	0-50m	
Mini Bat 07a	454536	5637221	2022-06-13	22:30	CONI	CONI	1	Certain	0-50m	
Mini Bat 07a	454536	5637221	2022-06-15	21:30	CONI	CONI	1	Certain	50m+	
Mini Bat 07a	454536	5637221	2022-06-15	22:30	CONI	CONI	1	Certain	50m+	
Mini Bat 07a	454536	5637221	2022-07-07	21:29	CONI	CONI	1	Certain	50m+	
Mini Bat 07a	454536	5637221	2022-07-07	22:29	CONI	CONI	1	Certain	0-50m	
Mini Bat 07a	454536	5637221	2022-07-07	23:29	CONI	CONI	1	Certain	0-50m	
Mini Bat 07b	457124	5636054	2023-05-31	23:18	CONI	CONI	1	Uncertain	50m+	very faint CONI song in last 20 seconds
Mini Bat 07b	457124	5636054	2023-06-05	21:23	CONI	CONI	1	Certain	0-50m	
Mini Bat 08b	459376	5633010	2023-06-10	21:27	CONI (2+)	CONI	2	Certain	0-50m	CONI multiple ind. song and boom heard
Mini Bat 08b	459376	5633010	2023-06-10	22:27	CONI	CONI	1	Certain	50m+	
Mini Bat 11a	458974	5632922	2022-06-13	21:28	CONI	CONI	1	Certain	50m+	

ARU Deployment	Easting	Northing	Recording Date	Recording Time	Spp_No	Species	# Ind.	Confidence	Distance Code	Comments
Mini Bat 13a	471526	5622137	2022-07-07	21:29	CONI	CONI	1	Certain	0-50m	
Mini Bat 13a	471526	5622137	2022-07-07	22:29	CONI	CONI	1	Certain	50m+	
Mini Bat 13b	448741	5637629	2023-06-10	21:27	CONI	CONI	1	Certain	0-50m	song and boom
Mini Bat 13b	448741	5637629	2023-06-10	22:27	CONI (2+)	CONI	2	Certain	0-50m	multiple individuals
Mini Bat 13b	448741	5637629	2023-06-10	23:27	CONI (2+)	CONI	2	Certain	0-50m	multiple individuals
Mini Bat 15a	448597	5638472	2022-07-07	22:29	EWPW	EWPW	1	Certain	50m+	
Mini Bat 15a	448597	5638472	2022-07-07	23:29	EWPW	EWPW	1	Certain	50m+	
Mini Bat 15b	457764	5635868	2023-06-10	21:27	CONI (2+)	CONI	2	Certain	0-50m	multiple individuals; song and boom
Mini Bat 16a	464030	5632158	2023-06-07	22:25	CONI	CONI	1	Certain	0-50m	
Mini Bat 16a	464030	5632158	2023-06-11	22:28	CONI	CONI	1	Certain	50m+	CONI 'boom'; WSIN distant
Mini Bat 17a	455122	5636598	2023-06-08	21:26	CONI	CONI	1	Certain	50m+	
Mini Bat 17a	455122	5636598	2023-06-08	22:26	CONI	CONI	1	Certain	0-50m	
Mini Bat 17a	455122	5636598	2023-06-10	21:27	CONI (2+)	CONI	2	Certain	0-50m	CONI song and boom; multiple individuals
Mini Bat 17a	455122	5636598	2023-06-10	22:27	CONI (2+)	CONI	2	Certain	50m+	CONI song and boom; multiple individuals
Mini Bat 17a	455122	5636598	2023-07-03	21:31	CONI (2+)	CONI	2	Certain	50m+	CONI - multiple individuals; song and boom
Mini Bat 18a	454218	5636316	2023-06-08	21:26	CONI	CONI	1	Certain	50m+	
Mini Bat 18a	454218	5636316	2023-06-10	21:27	CONI	CONI	1	Certain	50m+	faint boom
Mini Bird 02a	460486	5634027	2023-06-23	22:33	CONI	CONI	1	Certain	50m+	
Mini Bird 03a	452418	5634597	2023-06-10	22:28	EWPW	EWPW	1	Certain	50m+	
Mini Bird 04a	448039	5636580	2023-06-23	21:33	CONI	CONI	1	Certain	50m+	
Mini Bird 05a	449083	5636140	2023-06-10	22:28	EWPW (2+)	EWPW	2	Certain	0-50m	2 EWPW deafening
Mini Bird 05a	449083	5636140	2023-06-10	23:28	EWPW	EWPW	1	Certain	50m+	
Mini Bird 05a	449083	5636140	2023-06-23	22:33	EWPW	EWPW	1	Certain	50m+	
Mini Bird 06a	460076	5633831	2023-06-11	21:28	CONI	CONI	1	Certain	50m+	
Mini Bird 06a	460076	5633831	2023-06-23	22:33	CONI	CONI	1	Certain	50m+	
Mini Bird 08a	461070	5634080	2023-06-30	23:33	CONI	CONI	1	Certain	50m+	
Mini Bird 10a	459735	5633557	2023-06-11	22:28	CONI	CONI	1	Certain	50m+	
Mini Bird 10a	459735	5633557	2023-06-23	22:33	CONI	CONI	1	Certain	50m+	

*only ARU deployments stations with at least one nightjar (i.e., common nighthawk or eastern whip-poor-will) detected are presented here.

Appendix 45. Eastern Whip-poor-will Habitat Models

The GBR Project lies near the northern limit of eastern whip-poor-will breeding range in Ontario (Figure 1). That, together with declining populations in Canada and Ontario (COSEWIC 2009; ECCC 2018c), the relative abundance of breeding individuals at the GBR property is expected to be low. Potentially suitable breeding habitat in the Project AOI is not expected to be fully occupied by this species.

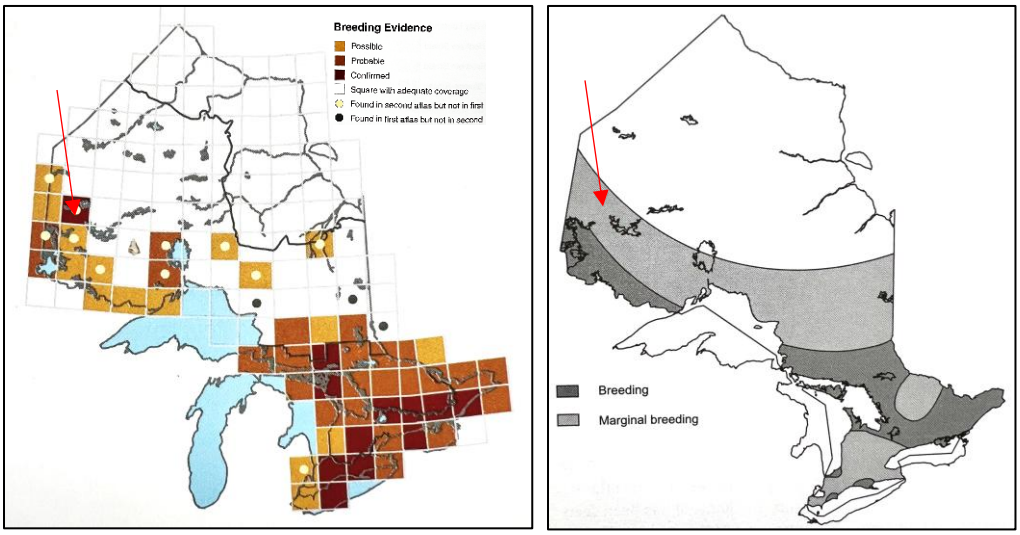


Figure 1. Breeding evidence of eastern whip-poor-will in northern Ontario, left (Cadman et al. 2007) and main breeding areas in Ontario (Sandilands 2005). GBR Project denoted by red arrow.

Eastern whip-poor-wills prefer a mix of open and forested habitats that meet nesting and foraging requirements (Cink et al. 2020; COSEWIC 2009). Whip-poor-wills nest directly on the ground, often in clearings or near the forest's edge, with eggs often laid leaf litter, pine needles, or well-drained soil (COSEWIC 2009; Sandilands 2010). Adults forage at night by sallying forth from perches on the ground or low branches, visually targeting flying insects (e.g., moths and large beetles) against the sky, often during moonlit hours (Cink et al. 2020; COSEWIC 2009; Sandilands 2010). Home ranges in northern Ontario telemetry study ranged from 20 to 500 ha, with an average of 130 ha (Rand 2014). Birds rarely forage far from nests sites (Sandilands 2010).

Typical breeding habitat in Ontario consists of regenerating burns and cutovers, savannahs, rock or sand barrens with scattered trees, and open conifer plantations (ECCC 2018; Mills 2007; Sandilands 2010). In Algonquin Provincial Park, Tozer et al. (2014), found that aggregated mean total of 12 ha of clearcuts per 100 ha of mature pine- dominated forest is associated with significantly higher occupancy by breeding Eastern Whip-poor-wills, and that the clearcuts can be composed of various sizes (i.e., 3–42 ha) and ages (i.e., 5-24 years) since harvest. Given that similar relationships have been found by others elsewhere, they concluded that clearcuts may increase the occupancy and abundance of breeding Eastern Whip-poor-wills in other regions and forest types throughout northeastern North America. In a northwestern Ontario study, whip-poor-will occupancy on the edge of clearcuts was not related to clearcut amount in the surrounding landscape at any scale but was higher when the surrounding landscape had higher proportions of open wetland, potentially tied to the availability of insect prey (Farrell et al. 2019).

In northwestern Ontario, whip-poor-wills were very abundant near Gull Bay in regenerating trembling aspen, jack pine, and tall shrubs, approximately 17-23 years post-wildfire[26] (Foster 2014, 2015, 2020, 2021); whip-poor-wills were also found in regenerating clearcuts in the adjacent landscape (Farrell et al. 201). Although regenerating vegetation was dense, sandy forest access roads and landings provided

[26] depending on year of sampling

foraging habitat and roosting sites. Whip-poor-will were also observed near White River utilizing regenerating jack pine cutover on sandy soils. Whip-poor-will sometimes use gravel access roads for roosting, dust bathing, and foraging (Cink 2002; Sandilands 2010). Roosts are an important component of nesting habitat; males roost during the day in dense woods with thick leaf litter and a shrubby understory, either on the ground or a low branch (Sandilands 2010).

A recent radio telemetry study in central Ontario (Grahame et al. 2021) suggests that shrubland and deciduous forest are important as both nocturnal foraging and daytime roosting habitat for Whip-poor-wills in the Torrance Barrens population, while rock barrens and mixed forest are important for foraging. No rock barren ecosites were delineated in the AOI. As discussed in *4.1.5 Upland Non-forested Communities*, individual patches of rock barren in the AOI are generally small (i.e., <1 ha) and scattered throughout the study area, and are typically too small to be delineated individually in the FRI. The limited availability of rock barren may reduce the suitability of the SSA for Whip-poor-will, particularly if these open areas are important for nocturnal foraging. Eastern Whip-poor-will are at least partially tolerant of human-modified landscapes that provide open areas in an otherwise forested matrix such as pipelines and transmission line rights-of-way (Sandilands 2010), cutovers (Farrell et al. 2017), and pastures (Rand 2014). For example, they continue to use surrounding landscapes at the active mine near Rainy River (Harris 2021).

During the Joint Review Panel for the Marathon Copper Palladium Project[27], OMECP provided the following guidance for defining eastern-whip-poor-will habitat: Suitable breeding and foraging habitat for this species typically includes some combination of:

- Sparse (<25%) to moderate (25-75%) tree cover (e.g., deciduous, mixedwood, coniferous, treed wetlands) and open habitat (e.g., shrublands, fallow fields, regeneration following fires or clearcuts, rock and sand outcrops, shrubby wetlands);
- Sparse to moderate shrub and herbaceous cover; and
- Well-drained soils (e.g., sand, sandy-loam).

OMECP has more recently (M. Schott pers. comm. *in* Honsberger 2023) provided a landcover-based approach to modeling potential high quality (i.e., Category 1) eastern whip-poor-will nesting habitat that includes the following:

- selecting forest patches <60 years old from Forest Resource Inventory (FRI) landcover mapping;
- identifying the subset of “dry” ecosites as defined in Banton et al. (2009);
- identifying a further subset of forests with ≤ 70% canopy closure and an understory closure of ≤20%; and
- identifying the areas with the above characteristics that fell within 30 m of “open” habitat (e.g., clearcuts, treeless wetlands, and lakes).

As per the General Habitat Description for this species (OMNR 2013b), eastern-whip-poor will habitat is categorized as:

- Category 1: Nest and the area within 20 m of the nest
- Category 2: The area between 20 m and 10 m from the nest or centre of approximated defended territory

[27] https://iaac-aeic.gc.ca/050/documents/p54755/141782E.pdf

- Category 3: The area of suitable habitat between 170 m and 500 m of the nest or centre of approximated defended territory.

Category 1 habitat has the lowest tolerance to alteration, with Category 3 having the highest.

No validated MECP habitat models for eastern whip-poor-will exist for northern Ontario[28]. MECP has provided the following guidance in Table 1 largely based upon the provincial recovery strategy (OMECP 2019) and General Habitat Description for Eastern Whip-poor-will (OMNR 2013b).

Based on the ecosites identified in that guidance, potential breeding and foraging habitat for the GBR project area was derived and is presented in Figure 94.

[28] K. Green, MECP, pers. comm. May 7, 2024.

Table 5 of the Recovery Strategy for the Eastern Whip-poor-will (*Antrostomus vociferus*) in Ontario		**Potential EWPW Habitat Considerations**		
Components of Habitat Suitability	**Biophysical Attributes**	**Forest Resource Inventory (FRI) Considerations**		**Ecosites and Polygon Types for Consideration**
Regional context	Forests (e.g., deciduous, mixedwood, coniferous, treed wetlands) and open habitats (e.g., shrublands, fallow fields, regeneration following fires or clear-cuts, rock and sand outcrops; shrubby wetlands) form a mosaic			
Habitats suitable for both nesting and foraging	• Forests with sparse to moderate [xii] tree cover or open habitats. **and** • Sparse to moderate shrub and herbaceous cover. **and** • Well-drained soils (e.g., sand, sandy-loam) ○ Within an atlas square, includes all corresponding areas of 3 ha [xiii] or more.	Conifer, deciduous, mixedwood forest stands ≤60 years, that meet the following criteria: i. Very shallow, dry to fresh ecosites; ii. Dry, sandy ecosites; iii. Fresh sandy or dry to fresh coarse loam ecosites; iv. Sparse to moderate forest cover (e.g., canopy closure ≤ 75%); v. Sparse to moderate shrub and herbaceous ground cover (e.g., understory ≤ 50%).		FRI polygons classified as forest and identified as: • B011, B012, B014, B015, B016, B018, B019, B033, B034, B035, B037, B038, B039, B040, B041, B042, B043, B048, B049, B050, B052, B053, B054, B055, B056, B057, B058, B059
Habitats suitable for nesting only [must be adjacent to foraging habitats]	• Forests with a dense tree cover **and** • Sparse to moderate shrub and herbaceous cover **and** • Well-drained soils (e.g., sand, sandy-loam) ○ Within an atlas square, includes all corresponding areas up to 30 m on the interior side of the forest edge.	*Forested areas suitable for nesting **(A)** and open areas suitable for foraging **(B)** must be adjacent*	**(A)** Forested areas suitable for nesting, that meet the following criteria: i. Conifer, deciduous, mixedwood forest stands <60 years; a. Very shallow, dry to fresh ecosites; b. Dry, sandy ecosites; c. Fresh sandy or dry to fresh coarse loamy ecosites; d. Dense forest cover (e.g., canopy closure > 75%); e. Sparse to moderate shrub and herbaceous ground cover (e.g., understory ≤ 50%).	FRI polygons classified as forest and identified as: • B011, B012, B014, B015, B016, B018, B019, B033, B034, B035, B037, B038, B039, B040, B041, B042, B043, B048, B049, B050, B052, B053, B054, B055, B056, B057, B058, B059
Habitats suitable for foraging only [must be adjacent to nesting habitats]	• Forests with sparse tree cover or open habitats **and** • Dense shrub cover **and** • Soil drainage is deficient ○ Within an atlas square, includes all corresponding areas up to 1,250 m from the edge with suitable nesting habitat. **or** • Agricultural land with scattered shrubs or trees (e.g., hedgerows) that can be used as perches ○ Within an atlas square, includes all corresponding areas up to 1,250 m from the edge with suitable nesting habitat.		**(B)** Open areas suitable for foraging, that meet the following criteria: i. Bedrock and sand barren ecosites; ii. Conifer, deciduous, mixedwood forest stands 0 - 15 years[1] (e.g., recent cutovers and/or burns); a. Sparse forest cover (e.g., canopy closure ≤ 25%); iii. Field and shrub ecosites (e.g., meadow, sparse shrub, shrub, etc.); iv. Anthropogenic clearings (e.g., agricultural fields, aggregate pits, etc.); v. Linear features (e.g., roads, transmission lines, etc.); vi. Wetland ecosites (e.g., marsh, swamp, bog, fen, etc.); vii. Waterbodies (e.g., lakes, rivers, etc.).	FRI polygons classified as forest and identified as: • B001, B002, B008, B009, B029, B030, B031, B044, B045, B046, B060, B061, B062, B077, B078, B079, B093, B094, B095, B138, B139, B140, B141, B195, B196, B198, B199, B163, B164, B165, B179, B180, B181 FRI polygons classified as: • rock, grass and meadow, unclassified (e.g., linear features), open wetland, and water

[xii] Sparse: <25%; Moderate: 25-75%; Dense: > 75%

[xiii] Minimum territory size for the Eastern Whip-poor-will (Cink 2002).

[1] *a clear cut forest can become too dense for nesting or foraging within 10-15 years under optimal conditions (Recovery Strategy for Eastern Whip-poor-will in Ontario, MECP, 2019)*

Appendix 46. Common Nighthawk Habitat Model

Common nighthawk breeds throughout much of Ontario (Figure 1). However, given its declining populations in Canada and Ontario (COSEWIC 2018b), the relative abundance of breeding individuals at the GBR property is expected to be relatively low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

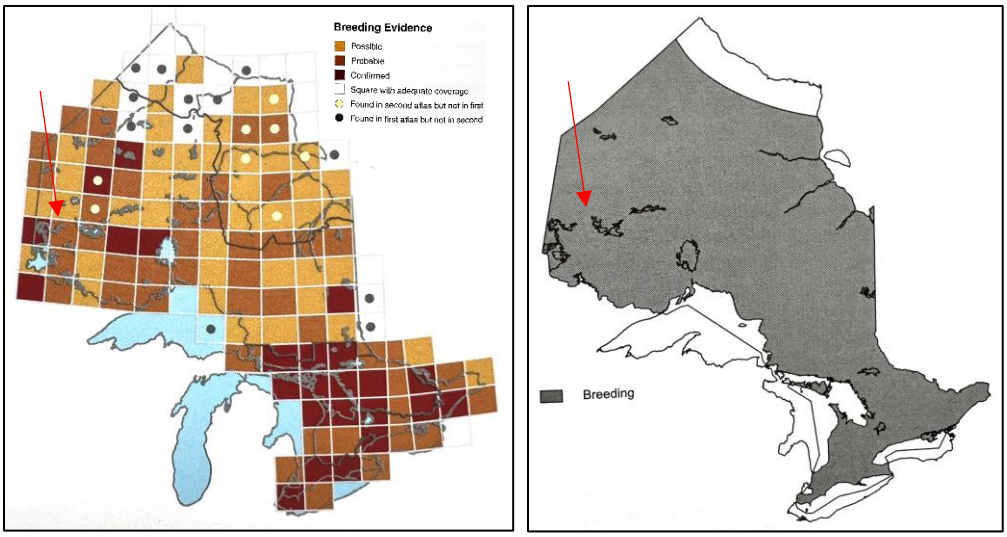


Figure 1. Breeding evidence of common nighthawk in northern Ontario, left (Cadman et al. 2007) and main breeding areas in Ontario (Sandilands 2005). GBR Project denoted by red arrow.

Common nighthawk nests in open habitats, forests, and anthropogenic habitats (COSEWIC 2018b; Environment Canada 2016). In predominantly forested landscapes, preferred breeding habitat includes rock outcrops, alvars, sand barrens, bogs, fens, and openings created by cutovers and wildfire, and transmission line rights-of way (COSEWIC 2018b; Foster et al. 2017; Sandilands 2010). In more open and developed landscapes, it will nest in grasslands, agricultural fields, gravel pits, prairies (Sandilands 2007, 2010). It will also nest on flat, graveled roofs in cities, at airports, and sometimes along railways and footpaths (Sandilands 2007). In a northwestern Ontario study, common nighthawk occupancy was lower in sites surrounded by landscapes with higher proportion of older (11-15 years old) clearcuts but was higher when the surrounding landscape had higher proportions of open wetland, potentially tied to the availability of insect prey (Farrell et al. 2019).

Breeding is almost exclusively in relatively open areas, with little overstory, understory, or ground cover (COSEWIC 2018b; Foster et al. 2017); they nest directly on the bare ground, litter, or moss. Nighthawks are crepuscular aerial insectivores, feeding at 1-100 m off the ground on a wide range of insects (Sandilands 2010). Common nighthawks show strong site fidelity and are strongly territorial, with estimates of home range sizes varying from approximately 4 to 40 ha (COSEWIC 2018b; Sandilands 2010).

No validated habitat models for common nighthawk exist for northern Ontario. Therefore, based on similar habitat preferences discussed above, the same habitat suitability model proposed for eastern whip-poor-will will be used for common nighthawk.

Appendix 47. Canada Warbler Habitat Model

The GBR Project lies near the centre of Canada warbler's breeding in Canada, but near the northern limit of its Ontario range (Figure 1). Given Canadian populations are declining (COSEWIC 2009; Environment Canada 2016b), the relative abundance of breeding individuals at the GBR property is expected to be relatively low, and potentially suitable breeding habitat is not expected to be fully occupied by this species.

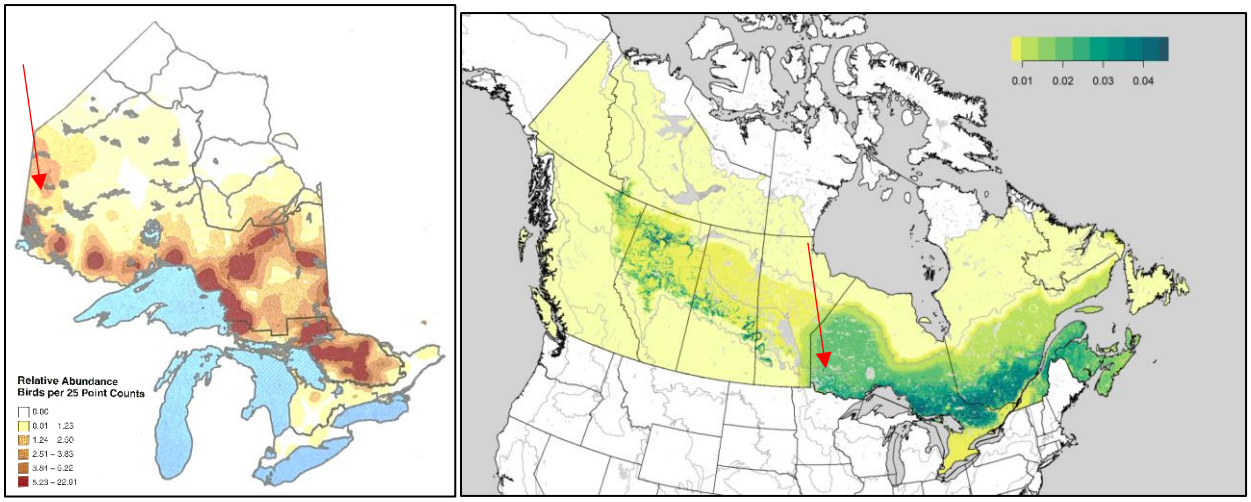


Figure 1. Relative abundance of Canada warbler in Ontario, left (Cadman et al. 2007) and average density of breeding males/ha of Canada warbler, right (BAMP 2020). Boreal Conservation Regions (BCRs) in grey outline; GBR Project denoted by red arrow.

Habitat associations for Canada warbler vary across its broad Canadian range (COSEWIC 2008; Environment Canada 2016b; Foster et al. 2017). For example, in Alberta, Canada warblers are commonly associated with older deciduous forest at the local scale, particularly near small, incised streams, and greater amounts of deciduous forest at the stand scale (Ball et al. 2016). In Alberta, Canada warbler is negatively associated with the amount of black spruce at the landscape scale (Ball et al. 2013 in Ball et al. 2016). In the Maritimes (BCR 14) Canada warbler typically breeds in wet deciduous and mixedwood forests, as well as moist seeps between areas of upland forest (Westwood et al. 2017). COSEWIC (2008, citing Conway 1999) states that Canada warbler is most common in mixed deciduous-coniferous forest with a well-developed shrub layer; this generally appears to be true in Ontario (Foster et al. 2017). Canada warblers nest on or near the ground, often concealed amongst downed logs and other coarse woody debris (McLaren 2007; COSEWIC 2008).

Canada warbler habitat along the north shore of Lake Superior was recently modelled using 374 georeferenced point counts (and 10 opportunistic observations) conducted by Northern Bioscience (Foster 2022). The location of singing male Canada warblers observed during the above surveys were overlain with current FRI data. Canada warblers were observed in 73 FRI stands during these surveys, of which most (77% of stands) were ecosites B055 Aspen-Birch Hardwood, B050 Pine-Black Spruce Conifer, and B052 Spruce-Fir Conifer. Ecosites B050 and B052 used by Canada warbler were conifer-dominated, but black spruce canopy cover in these stands was only 27% on average (range 0-60%), and hardwood (mainly white birch) had a mean canopy cover of 29% (range 20-50%). Other ecosites were used less frequently by Canada warbler, some of which (e.g., B134, B142) likely only represented a portion of their used home range (i.e., calling male may have been heard from the adjacent forest by the observer standing in the open meadow marsh or thicket swamp). In general, used stands were mature to overmature (i.e., least 100 years of age) with a tall (>15m) overstory. The overstory canopy was typically fairly open, averaging only 50% cover, which often allowed a dense shrub understory (that Canada warbler prefer) to develop in the sunlit gaps.

Based on extensive modelling using data from 1000s of point counts, the Boreal Avian Modelling Project (BAMP 2020) derived the following habitat association (Figure 2) for Canada warbler breeding habitat in Bird Conservation Region 8 (BCR 8): Boreal Softwood Shield, which broadly overlaps the GBR Project (Figure 51).

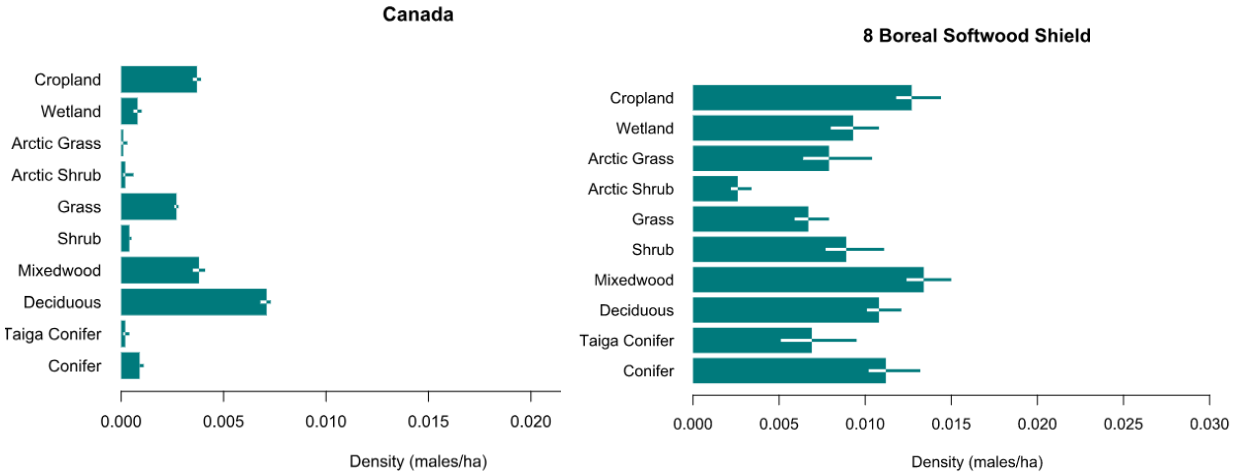


Figure 2. Estimated Canada warbler breeding density for different land cover classes in Canada (left) and Boreal Softwood Shield (BCR 8) (Source: https://borealbirds.github.io/species/CAWA).

The Canada-wide model aligned relatively well with published breeding habitat preferences discussed above, with Canada warblers most abundant in deciduous and mixedwood forests. However, BAMP modelling for BCR 8 suggests that Canada warblers are expected to be at least as abundant in cropland and conifer forests than deciduous forests. Predicted densities of Canada warbler are very low, which may help explain the BCR 8 model results. It appears the BAMP habitat associations from BCR 8 are of limited value in predicting Canada warbler density at the Project site.

Canada warblers were observed on plots or opportunistically at approximately 30 locations at or near the GBR Project site in 2023-2024. Stand characteristics within 100 m of the Canada warbler observations are summarized in Table 1. Most Canada warbler observations were in or near aspen-birch hardwoods (i.e., Ecosites B040, B055, B070, B088, B0104, B119) with varying soils and moisture regimes. Pine - black spruce conifer ecosites were also used (i.e., B012, B050, B065, B083, B099), typically if they had at least 20% canopy cover of white birch and/ trembling aspen. Stands were generally at least 40 years of age with mean overstory tree heights of at least 10 m. Other ecosites were used less frequently by Canada warbler, some of which (e.g., B097, B128) likely only represented a portion of their used home range calling male may have been heard from the adjacent forest by the observer standing in another ecosite. Overstory canopy closure and stocking were variable in preferred and used stands. Potentially suitable habitat based on modeling with these ecosites is presented in Figure 94.

Table 1. Characteristics of stands within 100 m of Canada warblers observed in 2023-2024 at or near the GBR Project.

Ecosite	Overstory Species Composition	Age (yrs)	Ht (m)	Canopy Closure (%)	Overstory Stocking
B012	$SB_{70}BW_{10}BF_{10}PJ_{10}$	91	12.0	45	0.4
B012	$SB_{80}BW_{10}PO_{10}$	71	13.0	30	0.5
B040	$BW_{50}PJ_{30}SB_{10}BF_{10}$	47	11.6	100	1.0
B049	$SB_{70}PJ_{20}BW_{10}$	76	14.0	60	0.6
B050	$PJ_{30}PO_{30}SB_{30}BW_{10}$	101	18.0	40	0.7
B050	$PJ_{50}BW_{30}PO_{20}$	40	8.0	65	0.6
B050	$PJ_{50}PO_{30}BW_{10}SB_{10}$	40	11.0	75	0.7
B050	$SB_{50}BW_{20}BF_{20}PO_{10}$	76	14.0	60	0.6
B050	$SB_{50}BW_{20}SW_{20}PO_{10}$	76	15.0	40	0.6
B050	$SB_{60}PJ_{20}PO_{20}$	101	18.0	65	0.8
B055	$BW_{30}PJ_{30}SB_{20}PO_{20}$	40	11.0	80	0.8
B055	$BW_{30}SB_{30}PO_{20}SW_{10}PB_{10}$	76	18.0	50	0.7
B055	$BW_{30}SB_{30}SW_{20}PO_{20}$	76	18.0	60	0.6
B055	$BW_{40}PO_{30}SB_{20}BF_{10}$	66	17.0	80	0.9
B055	$PO_{40}SB_{30}BW_{20}SW_{10}$	71	21.0	65	0.6
B055	$PO_{50}PJ_{30}SB_{10}BF_{10}$	40	12.0	90	0.9
B055	$PO_{60}BW_{20}PJ_{10}SB_{10}$	40	12.0	90	0.8
B055	$PO_{60}BW_{20}PJ_{10}SB_{10}$	40	12.0	90	0.8
B055	$PO_{60}BW_{20}PJ_{10}SB_{10}$	40	12.0	90	0.8
B055	$PO_{60}BW_{20}SB_{10}PJ_{10}$	40	13.0	85	0.8
B055	$PO_{60}PJ_{40}$	40	12.0	80	0.8
B055	$PO_{90}PJ_{10}$	51	20.0	80	0.8
B055	$PO_{90}PJ_{10}$	51	20.0	80	0.8
B055	PO_{100}	5	0.0	0	0.0
B055	PO_{100}	5	0.0	0	0.0
B055	$Pt_{70}Bf_{10}Sb_{10}Bw_{10}$	61	18.0	60	0.7
B055	$Pt_{70}Bf_{10}Sb_{10}Bw_{10}$	61	18.0	60	0.7
B055	$Pt_{80}Bf_{10}Sb_{10}$	61	18.0	60	0.7
B065	$PO_{70}SB_{10}PJ_{10}BW_{10}$	51	15.0	90	0.9
B065	$PO_{70}SB_{10}PJ_{10}BW_{10}$	51	15.0	90	0.9
B065	$Sb_{40}Bw_{30}Bf_{20}Pt_{10}$	81	11.0	50	0.5
B065	$Sb_{50}Bw_{20}Pt_{20}Bf_{10}$	61	10.0	50	0.5
B065	$Sb_{50}Bw_{20}Pt_{20}Bf_{10}$	61	10.0	50	0.5
B065	$SB_{60}BW_{20}PO_{10}PB_{10}$	66	16.0	80	0.8
B070	$Bw_{50}Sb_{20}Pt_{20}Bf_{10}$	81	15.0	60	0.5
B070	$PO_{60}BW_{20}BF_{20}$	40	12.0	90	0.6
B083	$Pj_{40}Sb_{30}Pt_{30}$	49	13.2	70	1.1
B088	$Pt_{50}Bw_{30}Bf_{10}Pb_{10}$	81	22.0	50	0.5
B088	$Pt_{50}Bw_{30}Bf_{10}Sb_{10}$	81	21.0	40	0.4
B088	$Pt_{50}Bw_{30}Bf_{10}Sb_{10}$	81	21.0	40	0.4
B088	$Pt_{50}Bw_{30}Bf_{10}Sb_{10}$	81	21.0	40	0.4
B088	$Pt_{50}Bw_{30}Bf_{10}Sb_{10}$	81	21.0	40	0.4
B097	$PR_{80}PJ_{20}$	24	4.0	70	0.7
B099	$SB_{30}BW_{30}SW_{30}PO_{10}$	76	16.0	50	0.5
B099	Sb_{100}	5	0.0	0	0.0
B101	$LA_{30}SB_{30}BF_{20}BW_{10}SW_{10}$	43	15.1	90	0.8

Ecosite	Overstory Species Composition	Age (yrs)	Ht (m)	Canopy Closure (%)	Overstory Stocking
B101	$SW_{60}BW_{20}SB_{20}$	81	19.0	25	0.2
B104	$BW_{30}PO_{30}SB_{30}BF_{10}$	61	15.0	70	0.7
B104	$BW_{30}SB_{30}PO_{20}SW_{10}BF_{10}$	71	17.0	65	0.6
B104	$BW_{30}SW_{30}PO_{20}SB_{20}$	91	18.0	50	0.5
B104	$BW_{40}PO_{20}SW_{20}SB_{20}$	76	18.0	70	0.7
B104	$BW_{40}SW_{30}PO_{20}BF_{10}$	66	17.0	60	0.6
B104	$BW_{40}SW_{30}PO_{20}BF_{10}$	66	17.0	60	0.6
B104	$BW_{80}SW_{20}$	68	18.6	70	0.9
B104	$PO_{30}SB_{30}BW_{30}BF_{10}$	71	19.0	70	0.7
B104	$PO_{50}SB_{40}BW_{10}$	66	20.0	60	0.6
B104	$PO_{50}SW_{20}SB_{20}BW_{10}$	81	22.0	40	0.7
B104	$PO_{80}SW_{20}$	49	17.9	90	0.9
B104	PO_{100}	86	23.0	10	1.0
B104	$Pt_{60}Bw_{20}Sb_{20}$	51	20.0	80	0.8
B114	$Sb_{50}Pt_{30}Sw_{10}Bw_{10}$	111	12.0	20	0.7
B114	$SB_{70}BW_{20}LA_{10}$	71	11.0	60	0.6
B114	$SB_{70}PO_{20}SW_{10}$	91	14.0	65	0.6
B114	$SB_{90}PO_{10}$	81	13.0	15	0.6
B119	$PO_{40}SB_{30}BF_{20}BW_{10}$	81	18.0	50	0.6
B128	$SB_{60}LA_{20}PB_{10}BF_{10}$	91	12.0	50	0.5

Appendix 48. Eastern Wood-pewee Habitat Model

The GBR Project lies near the northern limit of the breeding range of eastern wood-pewee in Ontario (Figure 1) and, given it is a declining species, the relative abundance of breeding individuals is expected to be very low. Potentially suitable breeding habitat at the GPR project site is not expected to be fully occupied by this species.

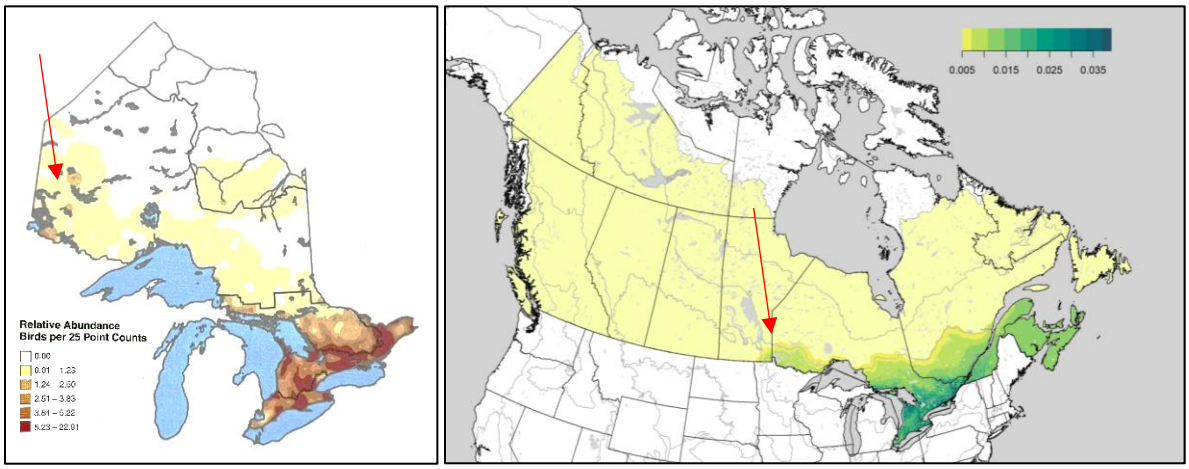


Figure 1. Relative abundance of eastern wood-pewee in Ontario, left (Cadman et al. 2007) and average density of breeding males/ha of eastern wood-pewee, right (BAMP 2020). Boreal Conservation Regions (BCRs) in grey outline; GBR Project denoted by red arrow.

Across its range, including Ontario, eastern wood-pewees typically breed in deciduous and mixed woods forest (COSEWIC 2012; Watt et al. 2018; ECCC 2023; McLaren 2007). The eastern wood-pewee is an obligate aerial insectivore, foraging on small flying insects either by hawking or by sallying forth from a suitable perch to catch perched insects (Hartung and Brawn 2005). It typically forages in the lower 0-15 m of the canopy but may avoid the shrub layer if dense (Hartung and Brawn 2005). As a result, eastern wood-pewees are typically found along forest edges or clearings, or open forests with a tall canopy (ECCC 2023; Falconer 2010; Reidy et al. 2014). This species is often associated with forests dominated by sugar maple, elm, and oak (COSEWIC 2012), species that are rare or absent at the GBR property. Forests are often intermediate age or mature (COSEWIC 2012), which is likely correlated with a more open understory in such tolerant hardwood forests. Habitat structure (i.e., opening in which to forage) may occasionally be more important than tree species, as eastern wood-pewees will also be found in conifer plantations in southern Ontario (Falconer 2010) and treed swamps in Nova Scotia (Brazner and MacKinnon 2020). The size of forest patches does not appear to be an important factor in habitat selection (COSEWIC 2012 and references therein).

Based on extensive modelling using data from 1000s of point counts, the Boreal Avian Modelling Project (BAMP 2021) derived the following habitat association (Figure 2) for eastern wood-pewee breeding habitat in Canada as a whole as well as BCR 8: Boreal Softwood Shield, which broadly overlaps the GBR Project (Figure 51).

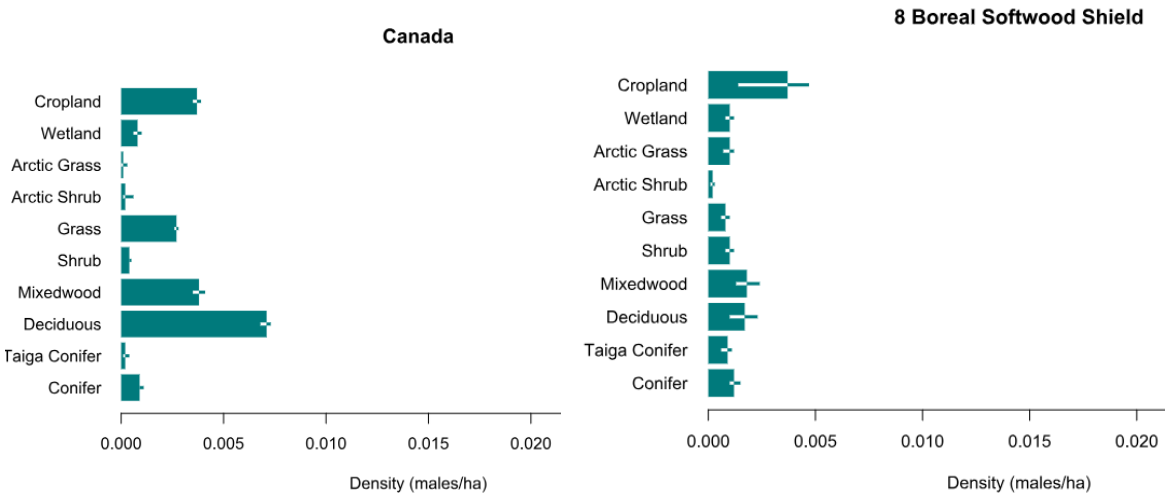


Figure 2. Estimated eastern wood-pewee breeding density for different land cover classes in Canada (left) and Boreal Softwood Shield (BCR 8) (Source: https://borealbirds.github.io/species/EAWP).

The Canada-wide model aligned fairly well with published breeding habitat preferences discussed above, with deciduous and mixedwood forests. However, BAMP modelling suggests that eastern wood-pewee are expected to be as more abundant in cropland than deciduous or mixedwood forests in BCR 8 (Figure 2). Predicted densities of eastern wood-pewee are very low, which may help explain the BCR 8 model results. It appears the BAMP habitat associations from BCR 8 is of limited value in predicting eastern wood-pewee density at the Project site.

OMNR (D'Eon and Watt 1994) developed a qualitative forest habitat suitability matrix for wildlife species in northeastern Ontario based on literature review and expert opinion. Eastern wood-pewee was identified as preferring mature and old growth tolerant hardwood mixedwood and sugar maple/yellow birch forests (Site Types 15,16) but also using other mixedwood and hardwoods (Site Types 3, 7). Given the lack of sugar maples, yellow birch, and tolerant hardwoods in the Red Lake area, this model is of limited utility for the GBR Project.

No validated habitat models for eastern wood-pewee exist for northwestern Ontario. Therefore, based on the habitat preferences discussed above, the following habitat suitability model is proposed for this species in the GBR AOI. Potential habitat for eastern wood-pewee would have the following characteristics:

- Preferred habitat consists of
    - Deciduous upland forest or hardwood swamp (B016-018, B040-042, B055-B058, B070-B075, B088-091, B104-107, B119-124, B130-B133) or
    - Mixedwood ecosites (B015, B019, B027, B028, B39, B043, B054 B059, B069, B076, B087, B092, B103, B108, B118, B125) and
    - with a stand age of 40+ years
- Used habitat consists of
    - Conifer-dominated upland forest (B012-015, B023-027, B033-B38, B048-B054, B064-068, B081-086, B097-102, B113-B11) and
    - a stand age of 40+ years

See Figure 99 for results of habitat modeling at the GBR property for eastern wood-pewee.

Appendix 49. Evening Grosbeak Habitat Model

The GBR Project lies within the main breeding range of evening grosbeak in Canada (Figure 1). Population densities are generally low, even in the core breeding range due to the irruptive behaviour of this species (COSEWIC 2016a). Therefore, the relative abundance of breeding individuals at the GBR property is expected to be low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

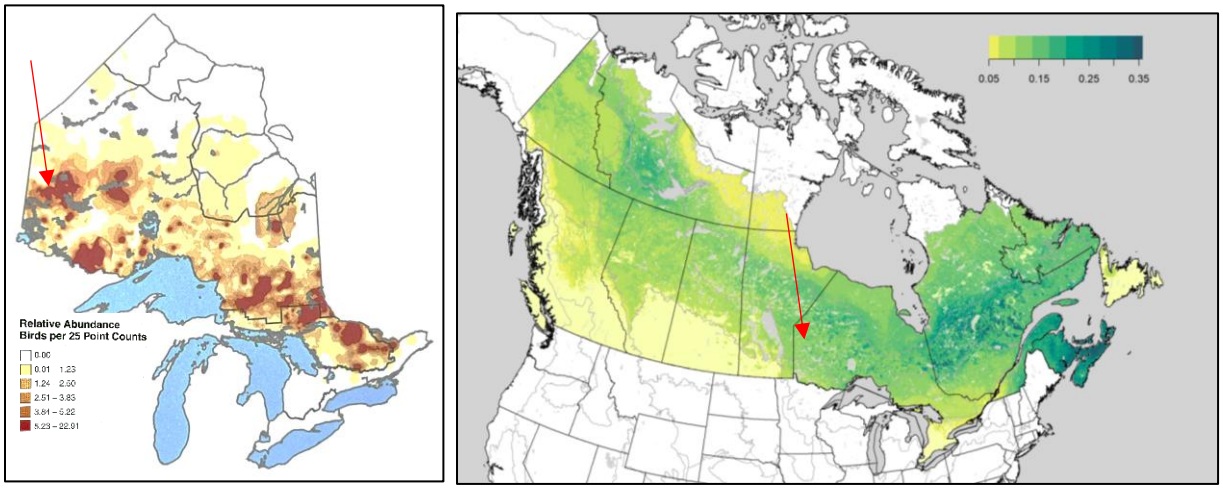


Figure 1. Relative abundance of evening grosbeak in Ontario, left (Cadman et al. 2007) and average density of breeding males/ha, right (BAMP 2020). Boreal Conservation Regions (BCRs) in grey outline; GBR Project denoted by red arrow.

In Ontario, evening grosbeaks breed primarily in open, mature mixedwood forests with a high proportion of balsam fir and white spruce (Cadman et al. 2007). Their distribution and abundance vary across their broad range (Figure 1), as this species moves large distances in response to the availability of food sources, particularly outbreaks of spruce budworm, its main food source during the breeding season (COSEWIC 2016a). No recent spruce budworm outbreaks are reported from the Project area (MNRF 2023) nor were any observed during 2022-2023 fieldwork. Evening grosbeaks are socially monogamous and not territorial during the breeding season (Cornell Lab of Ornithology 2019; COSEWIC 2016a). They are also nomadic during the winter in response to cone, berry, and seed crops.

OMNR (D'Eon and Watt 1994) developed a qualitative forest habitat suitability matrix for wildlife species in northeastern Ontario based on literature review and expert opinion. Evening grosbeak was identified as using all site types, from the young forest (40+ years) through to and including old growth.

Based on extensive modelling using data from 1000s of point counts, the Boreal Avian Modelling Project (BAMP 2021) derived the following habitat association (Figure 2) for evening grosbeak breeding habitat in Canada as a whole as well as BCR 8: Boreal Softwood Shield, which broadly overlaps the GBR Project (Figure 51).

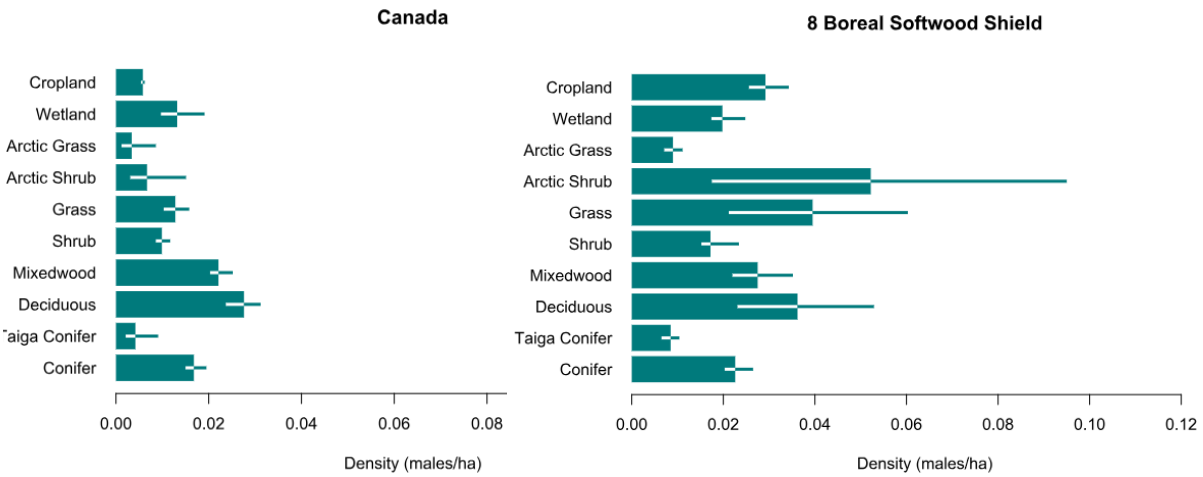


Figure 2. Estimated evening grosbeak breeding density for different land cover classes in Canada (left) and Boreal Softwood Shield (BCR 8) (Source: https://borealbirds.github.io/species/EVGR).

The Canada-wide model aligned fairly well with published breeding habitat preferences discussed above, with evening grosbeak most abundant in deciduous and mixedwood forests, followed by conifer forests and wetlands. However, BAMP modelling for BCR 8 suggests that evening grosbeaks are expected to be abundant in arctic shrub (lacking at Project area), grass, and cropland land cover classes, in addition to deciduous forest. Predicted densities of evening grosbeak are low, which may help explain the BCR 8 model results. It appears the BAMP habitat associations from BCR 8 are of limited value in predicting evening grosbeak density at the Project site.

No validated habitat models for evening grosbeak exist for northern Ontario. Given the BAMP habitat associations, published habitat preferences, and likely food sources (i.e., conifer trees for spruce budworm, deciduous trees and tall shrubs for mast), all forested ecosites older than 40 years of age at the Project site are considered potentially suitable habitat for evening grosbeak.

See Figure 100 for results of habitat modeling at the GBR property for evening grosbeak.

Appendix 50. Olive-sided Flycatcher Habitat Model

The GBR Project lies near the centre of the breeding range of olive-sided flycatcher in Canada (Figure 1). Population densities are generally low (Figure 2), even in the core breeding range, and the species is declining. Therefore, the relative abundance of breeding individuals at the GBR property is expected to be low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

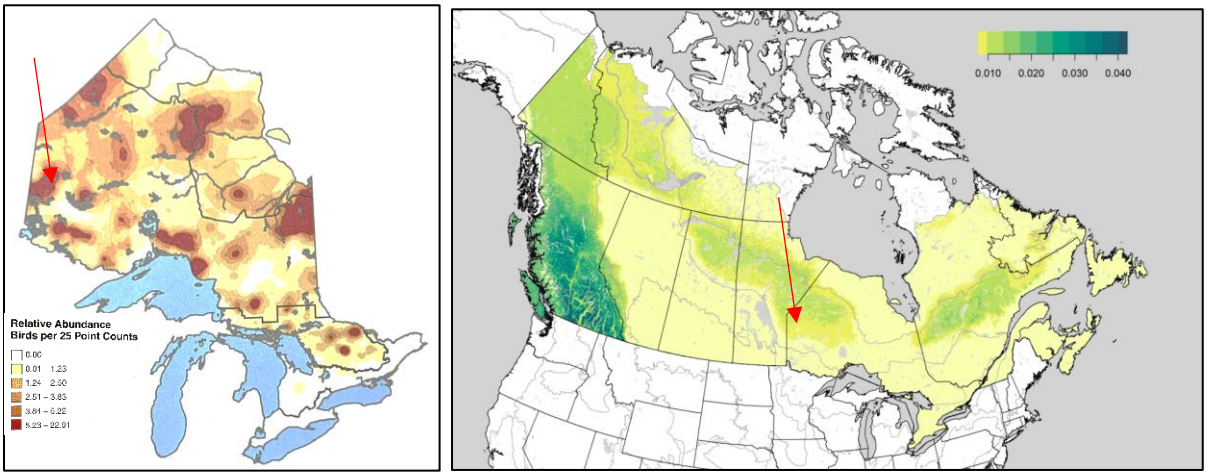


Figure 1. Relative abundance of olive-sided flycatcher in Ontario, left (Cadman et al. 2007) and average density of breeding males/ha of olive-sided flycatcher, right (BAMP 2020). Boreal Conservation Regions (BCRs) in grey outline; GBR Project denoted by red arrow.

Breeding habitat for olive-sided flycatchers consists of bogs, fens, and other peatlands, as well as riparian zones, cutovers, and burns (Chesky 2007; COSEWIC 2007; Environment Canada 2016d; Foster et al. 2017). At least in western North America, this species may have historically depended on post-fire habitats, with abundant snags and extensive open areas (Hutto 1995). At the landscape level in Quebec, olive-sided flycatchers selected mixed forest stands, forest edges, and recent clear-cuts (Anctil et al. 2017). Living or dead (snags) perches are critical habitat components for this species, which is an obligate aerial insectivore, hawking capture bees, wasps, beetles, dragonflies and other flying insects in open areas after sallying forth from a suitable perch (COSEWIC 2007; Foster et al. 2017). Suitable habitat in Ontario is often conifer forest edge (Chesky 2007), especially sparse black spruce on organic soils; however, the structural component (i.e., perches adjacent to open areas for foraging, appear more important that tree species age, height, or species composition (Foster et al. 2017).

Based on extensive modelling using data from 1000s of point counts, the Boreal Avian Modelling Project (BAMP 2021) derived the following habitat association (Figure 2) for olive-sided flycatcher breeding habitat in Canada as a whole as well as BCR 8: Boreal Softwood Shield, which broadly overlaps the GBR Project (Figure 51).

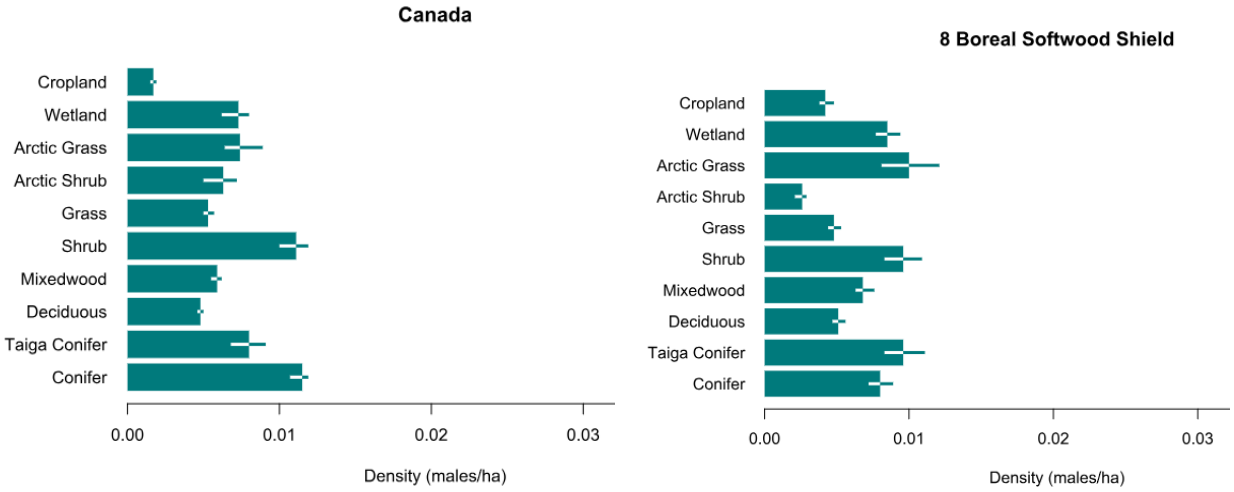


Figure 2. Estimated olive-sided flycatcher breeding density for different land cover classes in Canada (left) and Boreal Softwood Shield (BCR 8) (Source: https://borealbirds.github.io/species/OSFL).

Whereas the Canada-wide model aligned fairly well with published breeding habitat preferences discussed above, the BAMP model for BCR 8 showed less distinct differences in estimated olive-sided flycatcher density among land cover classes, and Arctic Grass land cover class is lacking in the Red Lake area. According to the BCR 8 BAMP model, wetland, shrub, and (taiga) conifer land cover classes are the most likely to support breeding rusty blackbird in the at the GBR Project.

OMNR (D'Eon and Watt 1994) developed a qualitative forest habitat suitability matrix for wildlife species in northeastern Ontario based on literature review and expert opinion. Olive-sided flycatcher was identified as preferring mature and old growth forests of dominated by back spruce (Site Types 5, 8, 11, 12), but also using similar-aged jack pine forests and those on very shallow soils (Site Types 1, 2, 4), as well as edges of bogs and lowland conifers.

Habitat modelling for olive-sided flycatcher was presented in the recently approved environmental assessment for the East-West Tie (EWT) Transmission Project (Nextbridge 2018), which is also located in northwestern Ontario. Suitable olive sided flycatcher breeding habitat was based on:

- mature and late successional coniferous or mixedwood forest according to the forest units and onset ages of 60-80 years depending on forest; and
- 50 m on either side of coniferous or mixedwood forest over 39 years of age (i.e., immature or older) and adjacent to wetlands and waterbodies (excluding Lake Superior due to its large size) as identified in FRI data and in the MNRF waterbody data set, burns less than 25 years old, and cutblocks.

The EWT habitat model is not directly applicable to the GBR Project since it is based on northeastern Ontario *forest units* rather than provincial boreal *ecosites* but supports the importance of mixedwood and conifer-dominated forests, often in association with adjacent open habitats.

Given the literature and models discussed above, all mixedwood and conifer forest ecosites at the GBR Project site are considered potentially suitable habitat for olive-sided flycatcher. In addition, several open wetland, shrub-dominated, and sparsely treed upland ecosites are also considered potentially suitable habitat as many provide tall shrubs and/or dead standing trees for perches in otherwise open habitat and may provide suitable foraging habitat during the breeding season for this species. The following habitat suitability model is therefore proposed for this species in the GBR AOI. Potential habitat for olive-sided flycatchers would have the following characteristics:

- Preferred habitat consists of

  - Conifer-dominated upland forest (B012-015, B023-027, B033-B38, B048-B054, B064-068, B081-086, B097-102, B113-B11) or
  - Conifer-dominated forested, treed, or semi-treed wetland (B126-B129, B136-137, B222-224)

    and
  - with a standage of 60+ years

    and
  - and within 100 m of waterbody, major watercourse (e.g., Dixie Creek or other double-line in OHN), open wetland, cutover/wildfire less than 25 years old, or anthropogenic opening e.g., gravel pit, transmission line

    or
  - cutover/wildfire less than 25 years old[29];

    or
  - rock barren, talus, or historic/raised beach (B007, B163-168)

- Used habitat consists of
  - Forested and treed ecosites as above with stand age of 60+ years and within 50 m of a small watercourse mapped as a single line in the Ontario Hydrological Network, or
  - Mixedwood ecosites (B015, B019, B027, B028, B39, B043, B054 B059, B069, B076, B087, B092, B103, B108, B118, B125) with a stand age of 60+ years and within 100 m of mapped waterbody, watercourse, open wetland, or cutover/wildfire less than 25 years old, or anthropogenic opening e.g., gravel pit, transmission line.

The spatial requirements of the olive-sided flycatcher habitat model were not followed in order to be precautionary given the relative abundance of unmapped disturbance on the GBR property from early exploration, forestry, and other anthropogenic disturbance.

See Figure 101 for the results of habitat modeling at the GBR property for olive-sided flycatcher.

[29] Wildlife naturally have skip patches and abundant snags; cutovers are required to have similar residual retention (OMNR 2014a)

Appendix 51. Rusty Blackbird Habitat Model

The GBR Project lies outside the core breeding range of rusty blackbirds in Ontario, with the main breeding abundance much farther north (Figure 1). Population densities are generally low, even in the core breeding range (Avery 2020). Therefore, the relative abundance of breeding individuals at the GBR property is expected to be very low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

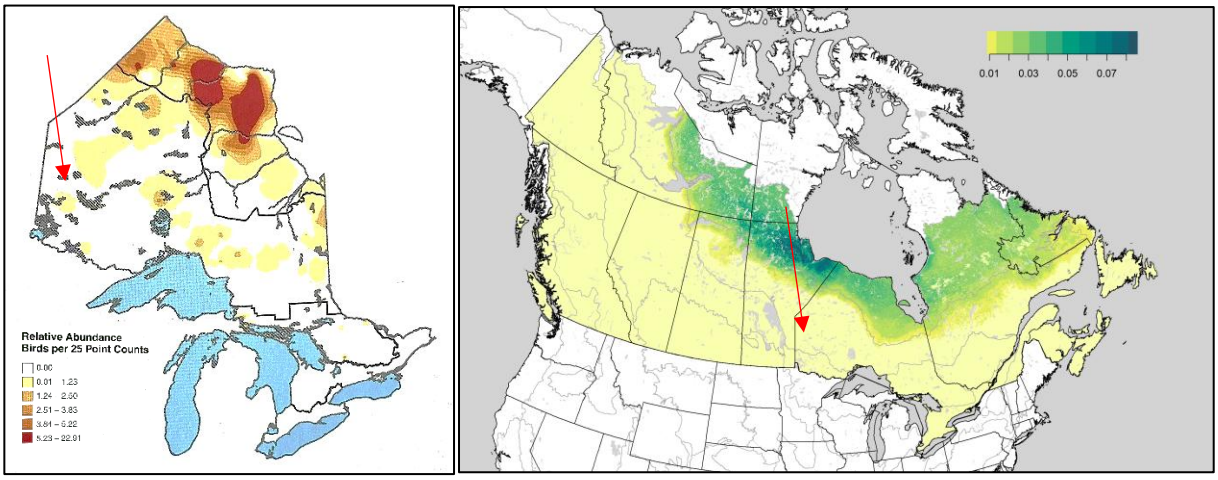


Figure 1. Relative abundance of rusty blackbird in Ontario, left (Cadman et al. 2007) and average density of breeding males/ha of rusty blackbird, right (BAMP 2020). Boreal Conservation Regions (BCRs) in grey outline; GBR Project denoted by red arrow.

Rusty blackbird breeding habitat consists of forested wetlands including conifer swamps, fens, bogs, muskeg, beaver ponds, and other wet opening in forests (COSEWIC 2017; Environment Canada 2015). They may also use alder and willow thickets in the far north of Ontario (Francis 2017) and remnant riparian forest adjacent to regenerating cutovers (COSEWIC 2006). Nests are primarily located in conifers close to waterbodies (less than 30m away) particularly in black spruce in Canada and Alaska although though they can also be found in deciduous trees (Avery 1995; Matsuoka et al. 2010). Home ranges of approximately 38 ± 13 ha have been reported (Powell et al. 2010). Nests in smaller diameter spruce trees (i.e., less than 8 cm DBH) had lower predation rates, as did those in spruce less than 11 m in height, likely due to increased rates of predation by red squirrels in larger, cone-bearing trees (Matsuoka et al. 2010). Smaller trees and shrubs near water were associated with higher nest productivity.

Based on extensive modelling using data from 1000s of point counts, the Boreal Avian Modelling Project (BAMP 2021) derived the following habitat association (Figure 2) for rusty blackbird breeding habitat in Canada as well as BCR 8: Boreal Softwood Shield, which broadly overlaps the GBR Project (Figure 51).

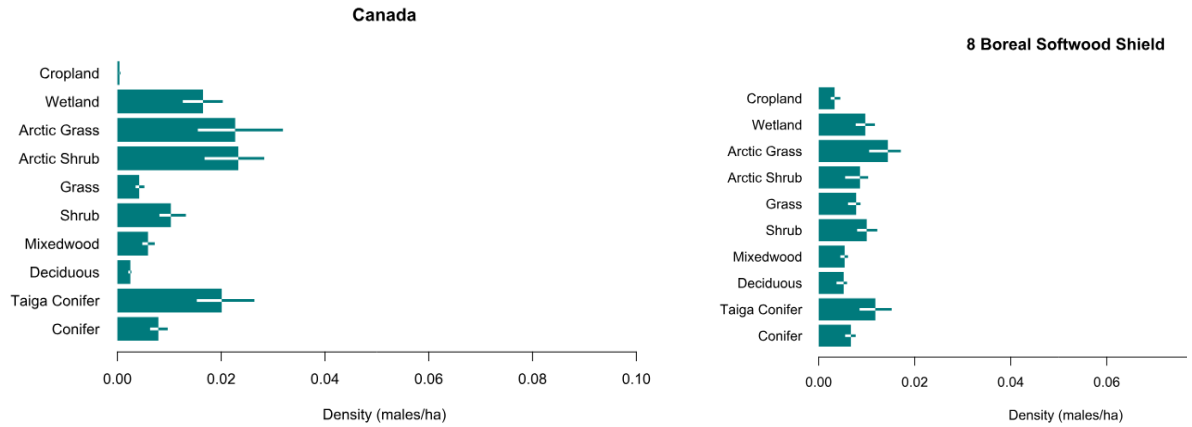


Figure 2. Estimated rusty blackbird breeding density for different land cover classes in Canada (left) and Boreal Softwood Shield (BCR 8) (Source: https://borealbirds.github.io/species/RUBL).

Whereas the Canada-wide model aligned fairly well with published breeding habitat preferences discussed above, the BAMP model for BCR 8 showed less distinct differences in estimated blackbird density among land cover classes, perhaps due to lower sample sizes in BCR outside its core breeding range. Arctic Grass and Arctic Shrub are lacking in the Red Lake area; wetland, taiga conifer, and shrub land cover classes are the most likely to support breeding rusty blackbird in the at the GBR Project

No appropriate habitat models for rusty blackbird exist for northern Ontario. Therefore, based on the habitat preferences discussed above, the following habitat suitability model is proposed for rusty blackbird in the GBR AOI. Potential habitat for rusty blackbird would have the following characteristics:

- Preferred habitat consists of
    - conifer-dominated swamps i.e., B127, B0128, B129, B222, B223, B224 or
    - conifer-dominated (sparse) treed bog or treed fen i.e., B126, B136, B137, or
    - organic or mineral thicket swamp i.e., B134, B135, and
    - dominant trees less than 11 m in height.
- Used habitat consists of
    - ecosites listed above with dominant trees greater than 11 m in height.

See Figure 102 for results of habitat modeling at the GBR property for rusty blackbird.

Appendix 52. Short-eared Owl Habitat Model

The GBR Project lies outside the three main areas of breeding for yellow rail in Ontario: 1) Hudson's Bay and James Bay coasts, 2) Rainy River area, and 3) southern and central Ontario (Figure 1). Population densities are generally low, and this species is declining nationally and in Ontario (COSEWIC 2021). Therefore, the relative abundance of breeding individuals at the GBR property is expected to be very low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

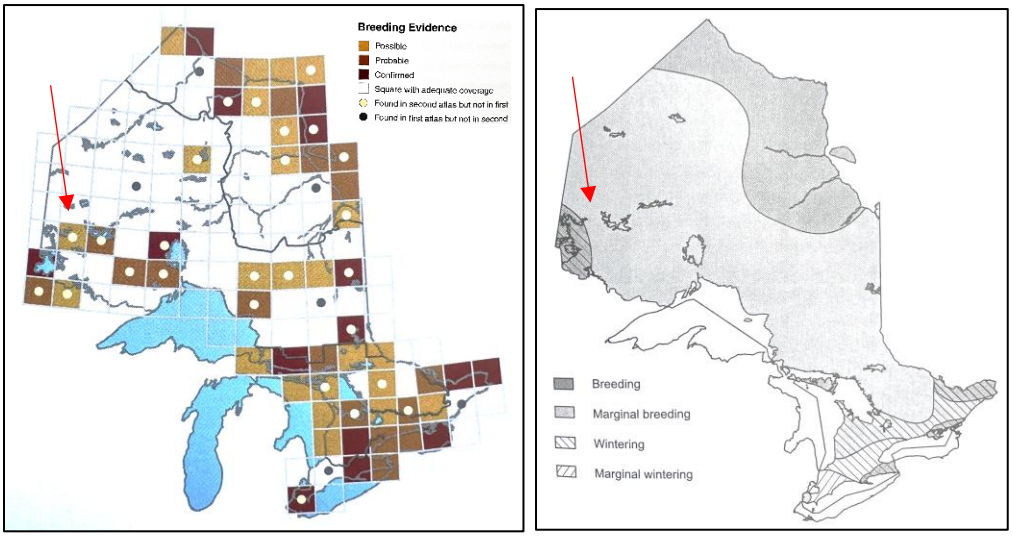


Figure 1. Breeding evidence of short-eared owl in northern Ontario, left (Cadman et al. 2007) and main breeding areas in Ontario (Sandilands 2005). GBR Project denoted by red arrow.

Only two e-Bird records are located within 20 km of the project Site (Figure 2). Both records are from T. Neidenbach during the migration period. One was near Bruce Lake at the abandoned Griffith Mine by T. Neidenbach on April 28, 1995, and the other was west of Pakwash Lake on October 17, 2020. These are the only records near the Project in Birds Canada's Nature Counts online tool as well (Figure 3). There are no iNaturalist records for this species within 100 km of the Project.

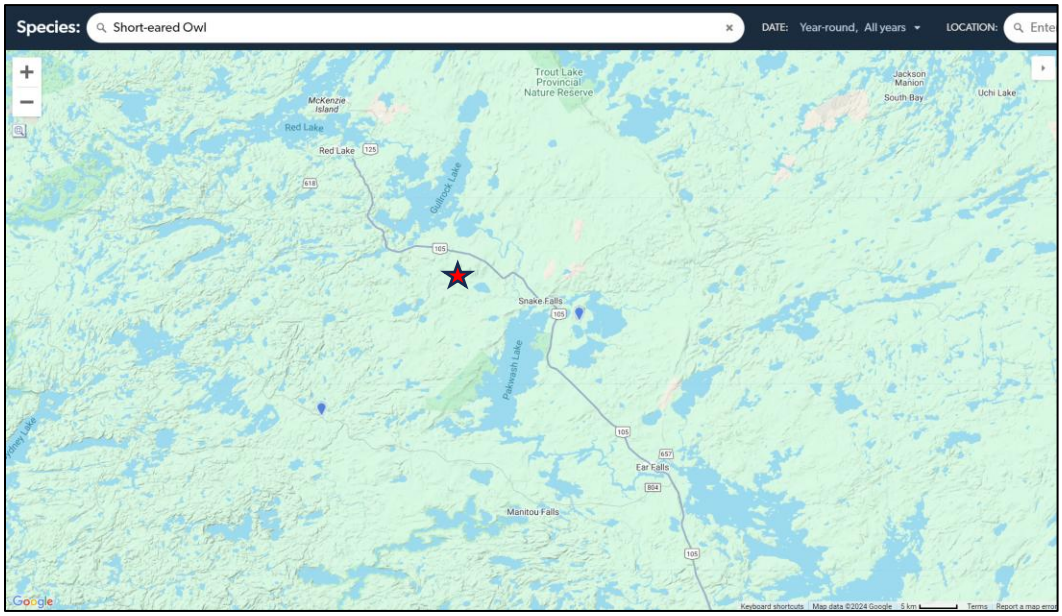


Figure 2. eBird observations as of October 2024 within 20 km of the GBR project site (star).

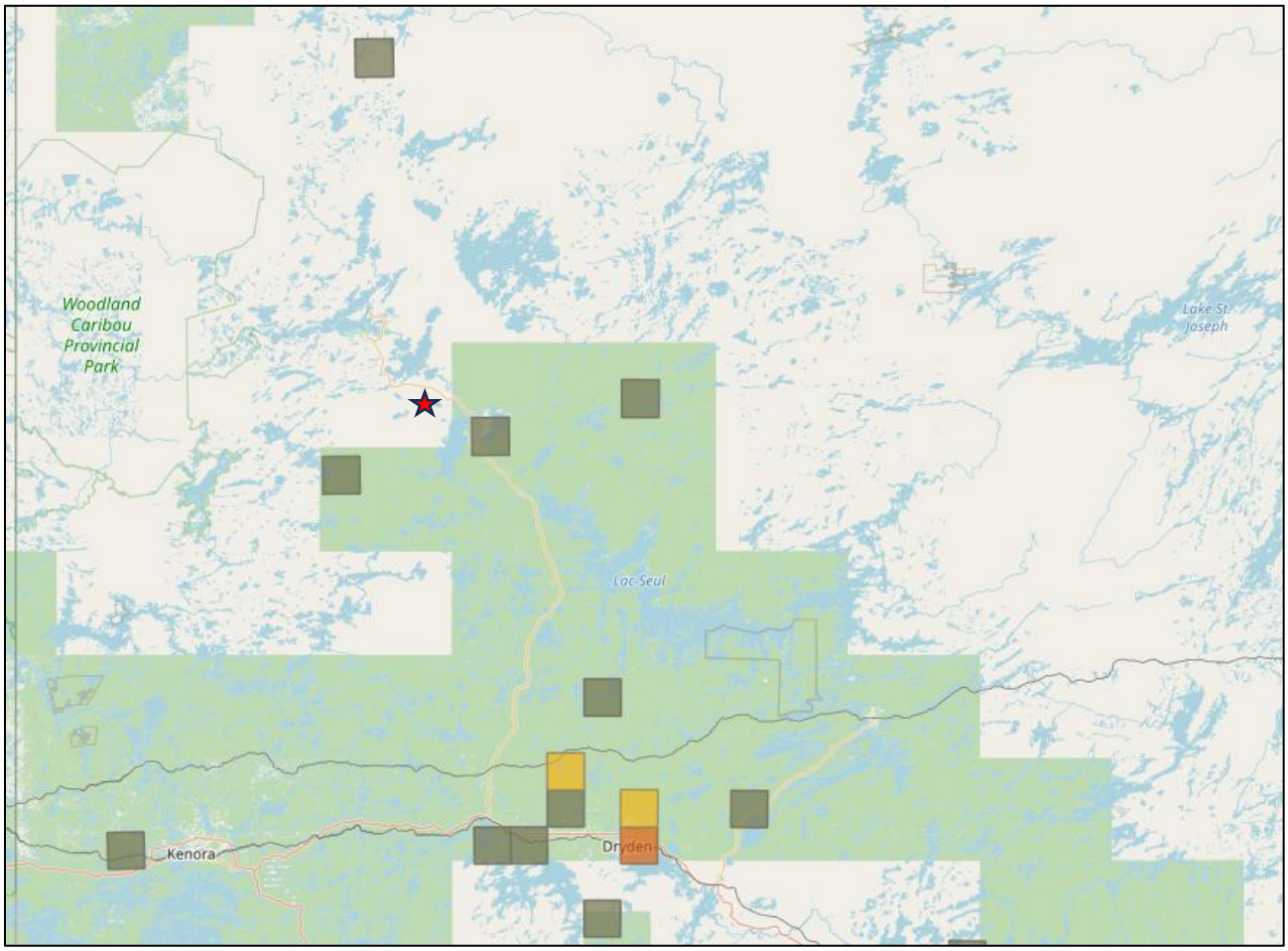


Figure 3. Short-eared owl observations near the GBR Project (star) from Nature Counts (https://naturecounts.ca/nc/default/explore.jsp#map)

Short-eared owls nest in large open areas such as tundra, large bogs and fens, marshes, clearcuts, and grassy fields including airports and inactive or abandoned farmland (Austen et al. 1994; COSEWIC 2021; Gabhauer 2007; Peck and James 1983; Sandilands 2010; Wiggins et al. 2006). It avoids extensive forested areas (Sandilands 2010). Nests are almost exclusively on the ground, typically near a clump of tall vegetation that provides cover (Wiggins et al. 2006), and often on hummocks or small knolls if in otherwise wet areas (e.g., marshes, peatlands) (Sandilands 2010). Hunting may occur day or night and consists of flying low (0.3 to 5 m height) above open habitat, occasionally hovering or hunting from perches. Short-eared owls forage primarily on microtine rodents particularly meadow voles and/or lemmings, which are associated with suitable breeding habitat (COSEWIC 2021; Sandilands 2010). Large areas (e.g., 75-100 ha) of suitable habitat are potentially required for breeding (Ausen et al. 1994; Sandilands 2010). Territories are defended and may range from approximately 20 ha to 100 ha, and larger when prey is scarce (Sandilands 2010). Habitat during migration is believed to be similar to breeding habitat, although minimum size may be less important.

No validated habitat models for short-eared owl exist for northern Ontario. Therefore, based on the habitat preferences discussed above, the following suitability model is proposed for short-eared owl in the GBR AOI. Potential breeding or migratory stopover habitat for short-eared owls would have the following characteristics:

- Preferred habitat consists of

  - fields (B029, B044, B060, B077, B093, B109), meadows (B008, B020, B030, B045, B061, B078), B094, B110), graminoid-dominated fens (i.e., B139, B140, B141), meadow marshes (B142, B143, B144), and/or open shore fens (B146), and
  - contiguous area of suitable ecosites is >20 ha.
- Used habitat consists of
  - Upland graminoid-dominated upland or wetland ecosites as above and
  - contiguous area of any size.

See Figure 104 for results of habitat modeling at the GBR property for short-eared owl.

Appendix 53. Yellow Rail Habitat Model

The GBR Project lies outside the three main areas of breeding for yellow rail in Ontario: 1) Hudson's Bay and James Bay coasts, 2) Rainy River area, and 3) southern and central Ontario (Tozer 2007) (Figure 1). Population densities are generally low, even in the core breeding range. Therefore, the relative abundance of breeding individuals at the GBR property is expected to be very low and potentially suitable breeding habitat is not expected to be fully occupied by this species.

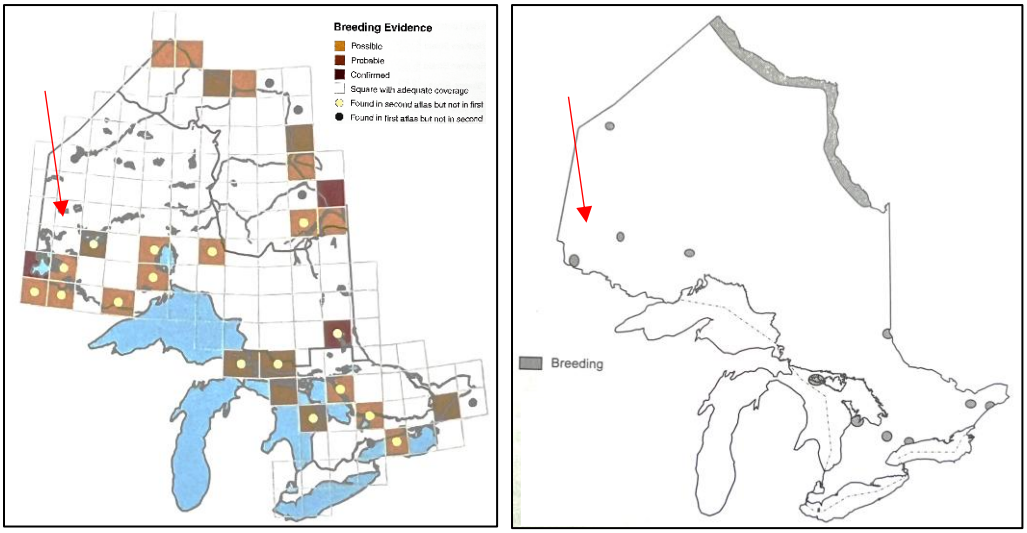


Figure 1. Breeding evidence of yellow rail in northern Ontario, left (Cadman et al. 2007) and main breeding areas in Ontario (Sandilands 2005). GBR Project denoted by red arrow.

Yellow rail breeding habitat in Ontario consists of large graminoid wetlands (Sandilands 2010; Tozer 2007). Staging habitat is believed to be similar to breeding habitat, although minimum size may be less important.

No validated habitat models for yellow rail exist for northern Ontario. Therefore, based on the habitat preferences discussed above, the following habitat suitability model is proposed for yellow rail in the GBR AOI. Potential habitat for yellow rail would have the following characteristics:

- Preferred habitat consists of
  - graminoid-dominated fens (i.e., B139, B140, B141), meadow marshes (B142, B143, B144), open shore fens (B146), and shallow marshes (B148, B149), and
  - contiguous area of suitable ecosites is >20 ha.
- Used habitat consists of
  - graminoid-dominated wetland ecosites as above and
  - contiguous area of any size.

See Figure 104 for the results of habitat modeling at the GBR property for yellow rail.