

Articles

Northern Forest Owl Survey: Red Lake

by

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Introduction

One group of birds that has not been well surveyed or monitored in the past has been the owls. This is especially true in boreal forest habitats, where access adds to the difficulty. At the present time, given the interest and concern regarding the conservation and sustainability of natural resources, efforts are being made by resource managers, in cooperation with conservation-oriented groups and companies, to determine population levels of owls and other organisms. Such surveys and monitoring programs can be used to determine presence or absence, population abundance, and distribution of selected species (Palmer 1987).

Owls pose special problems for monitoring programs. Accessibility, willingness of the species to respond to the survey methods being employed, environmental conditions, and time of year, are some examples of variables that may affect the survey results. Species that are rare, uncommon or whose habits are such that specialized survey techniques must be implemented, may create a more difficult situation to assess. The latter description is one that characterizes the Great Gray Owl (*Strix nebulosa*), a species of conservation interest in the boreal forest. It has been described as having a secretive nature (Bull and Henjum

1990), as the title of one publication; "Phantom of the Northern Forest" (Nero 1980), would imply. Although the Great Gray Owl's hunting habits are usually crepuscular, it also hunts nocturnally and is sometimes seen in broad daylight (Bull and Duncan 1993).

The Great Gray Owl was until recently designated as vulnerable in Canada (COSEWIC) and is presently designated as rare in Ontario (Ontario Ministry of Natural Resources). With these designations and the owl's unknown status in northwestern Ontario, a nocturnal audio survey was conducted in 1993 with the primary objective of determining presence/absence along specified routes. Another objective of the survey was to define a time frame during which optimal responses from Great Gray Owls would be achieved. Where possible, survey data were subsequently used to identify and protect Great Gray Owl habitat in managed areas on the Pakwash and Patricia Forest Units in the Red Lake area of northwestern Ontario. The success of the initial 1993 survey resulted in an expansion of the survey in 1994 and 1995.

Periodic sightings of Great Gray Owls, at all times of the year, occur in the Red Lake area. Until 1993, nests of this species had not been officially documented in the Red Lake area. However, a nest with young is known to

have occurred in the mid-1980s near Overnight Lake (Brett Hopkins, pers. comm.).

Study Area and Methodology

The study area is located approximately 40 km southwest of the town of Red Lake. The area is situated just south of the 51st parallel in the Hudson Bay drainage basin. Thin soils over bedrock, intermixed with scattered clay and silt deposits, have resulted in vegetation types dominated by boreal forest, bogs and fens. The predominant cover species are Black Spruce (*Picea mariana*) and Jack Pine (*Pinus banksiana*). Hardwoods, White Birch (*Betula papyrifera*)/Trembling Aspen (*Populus tremuloides*), are frequently found on deeper well drained soils within the coniferous forests. The landscape is generally flat to weakly broken (OMNR 1981).

The survey technique used has been described in Czerwinski (1995) and Duncan and Duncan (1991). It involves driving a specified route and stopping at measured intervals (0.8 km) along that route to play a pre-recorded call of a Boreal Owl (*Aegolius funereus*) and a Great Gray Owl. All owls seen or heard are documented. The direction from which any owls respond was recorded using a compass.

The rationale for employing the calls in the order described is to induce as many owls to respond as possible. Playing the call of a physically smaller owl first may reduce apprehension from other owls in the area, allowing a better response (Smith 1987).

Routes chosen were: a) adjacent to areas that were allocated for timber cutting in the upcoming year, or b) through areas that were perceived to be

high potential Great Gray Owl habitat. These high potential areas were thought to exist in close proximity to wetlands containing Tamarack (*Larix laricina*), as in southeastern Manitoba where Great Gray Owls show a preference for Tamarack bogs (Servos 1986). The timing of the survey restricts route options, as roads without snow cover during the late winter/early spring period (March/April) are scarce.

Weather conditions for the surveys were selected on the basis of wind speed (low), temperature (warmer than -10°C) and cloud cover (clear skies). Smith (1987) notes that the single most important weather variable negatively affecting response to song playback is wind. This was readily apparent, and as a result, the majority of surveys were completed on nights where wind speed was between 0 and 8 mph. Surveys continued until the interference from Wood Frogs (*Rana sylvatica*) and Spring Peepers (*Hyla crucifer*) was so great that it drowned out all other sounds. Surveys were generally discontinued in the first week of May.

In the days following the nocturnal audio surveys, ground searches for active nests were performed at sites where a response from a Great Gray Owl had been heard. The search method involved combing an area where a response had been heard using the compass bearing recorded during the survey (OMNR 1993).

Results

Ten routes (260 stations) were surveyed in 1993, 32 routes (676 stations) in 1994, and 27 routes (543 stations) in 1995. Great Gray Owl weekly mean response per station surveyed (all years) is depicted in Figure 1. This figure

WEEKLY MEAN RESPONSE PER STATION GREAT GRAY OWLS 1993 - 1995

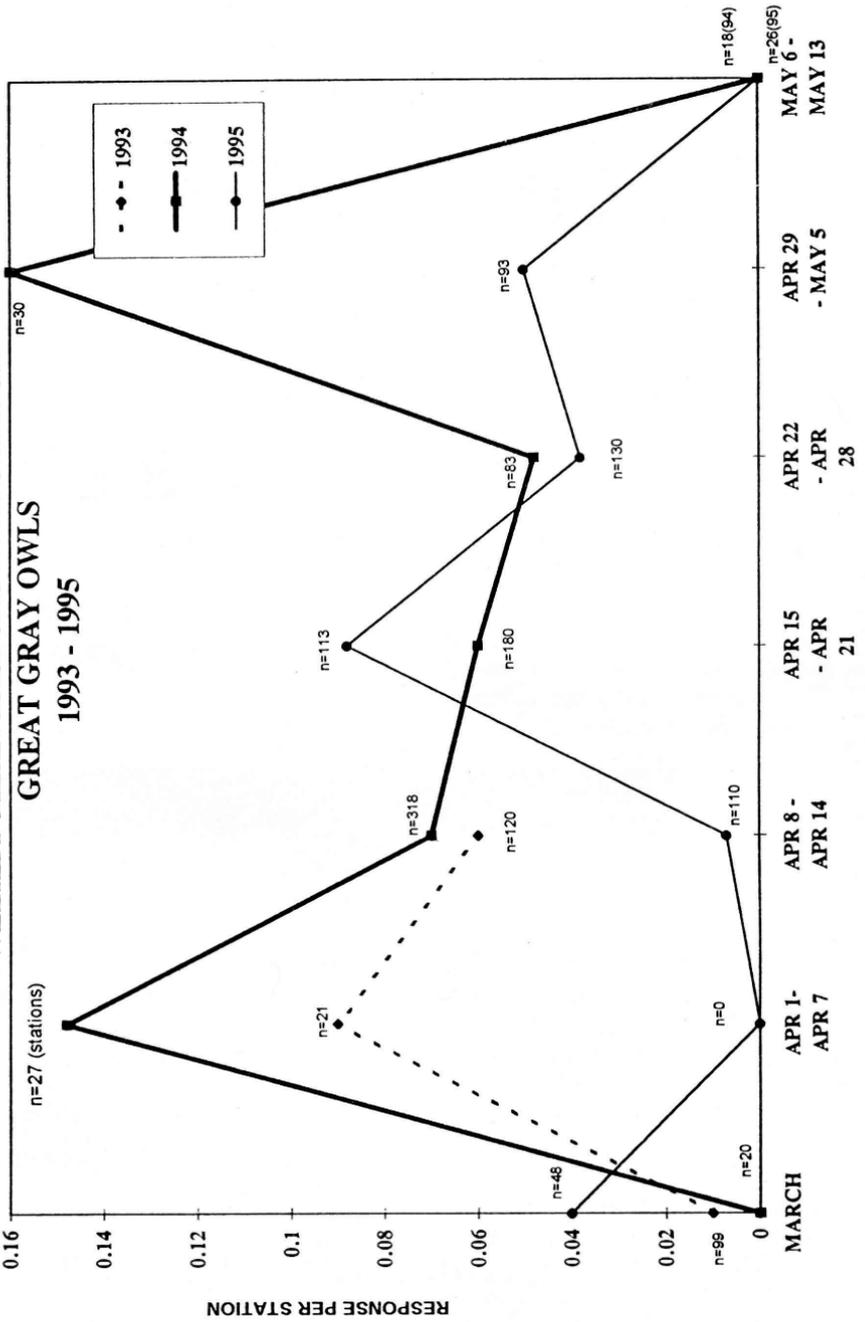


Figure 1

TOTAL WEEKLY RESPONSE
1993 - 1995

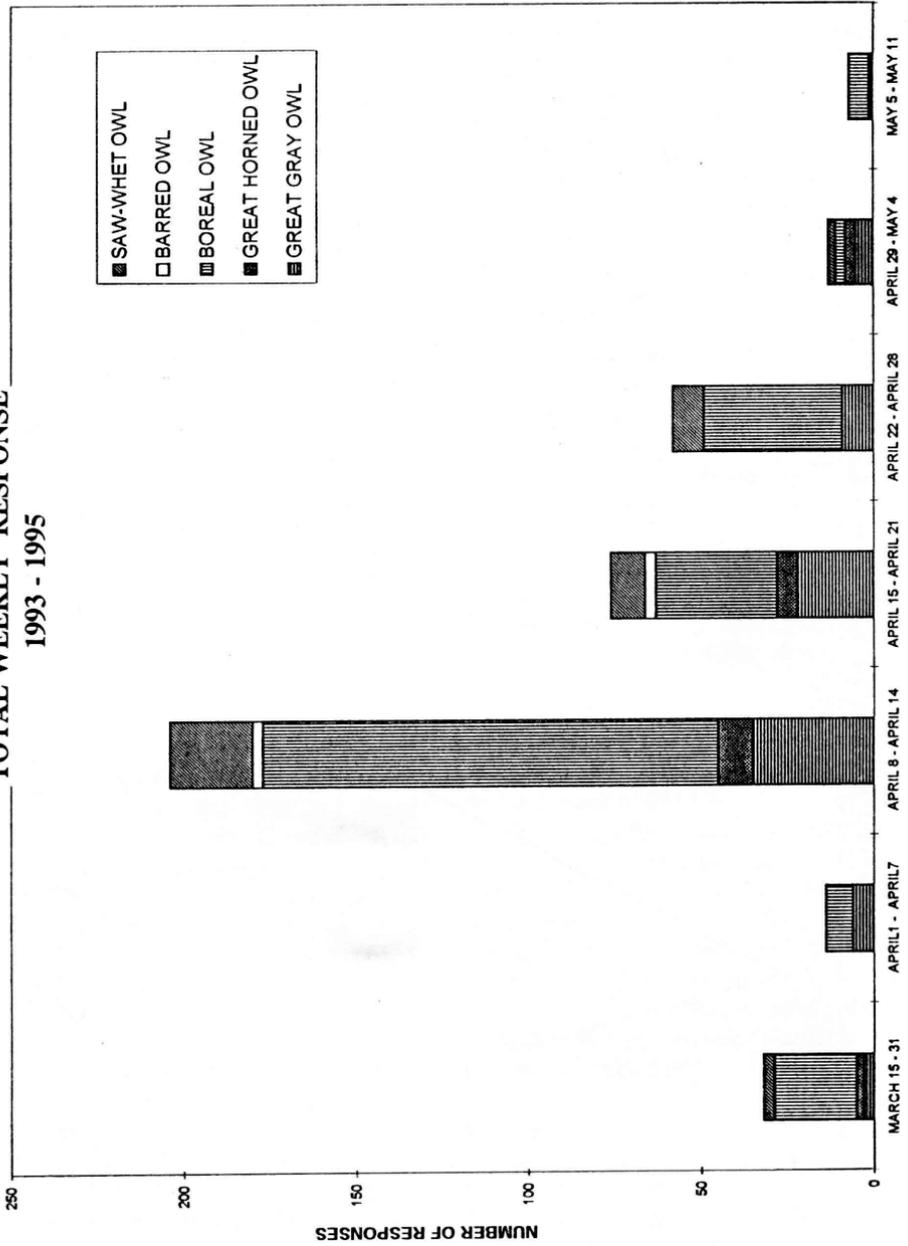


Figure 2

exhibits a varying rate of response over the survey period. Five species of owl (Great Gray Owl, Boreal Owl, Northern Saw-whet Owl (*Aegolius acadicus*), Great Horned Owl (*Bubo virginianus*), Barred Owl (*Strix varia*)) responded a total of 414 times over the three survey years. Figure 2 shows the total weekly response for all owls in all years. The figure shows a declining rate of response over the survey period.

In 1993, a solitary Northern Hawk Owl (*Surnia ulula*) was observed feeding young at a nest cavity in Balsam Poplar (*Populus balsamifera*) within the study area. An unidentified owl, displaying hunting habits of an Asio owl, either Short-eared (*Asio flammeus*) or Long-eared (*Asio otus*), was viewed just prior to the start of a survey route in 1995.

Of special interest were the other wildlife species heard during the surveys. Timber Wolves (*Canis lupus*) appeared to howl in response to the recordings. The extensive drumming of Ruffed Grouse (*Bonasa umbellus*) was heard late into the night and geese were often heard on their trek northwards. In late April, the arrival of Common Snipe (*Gallinago gallinago*) in the study area caused some confusion with less experienced surveyors, as its call is quite similar to that of the Boreal Owl. On a number of occasions, Boreal and other larger unidentified owls silently dropped in for a close inspection of their investigators, causing them to quickly drop their heads when a shadowy figure appeared at very close range!

Responses that proved to be from nesting pairs of Great Gray Owls occurred before 14 April (31 March, 5 April, 13 April) in 1993, and 21 April

(12 April, 20 April) in 1994. Although some of these nests were discovered later in April (25-29), the compass bearings of the responding Great Gray Owls, recorded at the time of the survey, were comparable to the search direction to the nest taken from the same survey station.

Discussion

At this time we have not isolated an "optimal survey window" as our results show that Great Gray Owls respond with a high degree of variability throughout the survey period (Figure 1). This variance could be a result of survey effort, weather conditions, abundance and/or an individual's response pattern. Although the response rate from all owls shows a weak decreasing pattern towards the end of the survey period (Figure 2), the same variables may affect response.

The mean date of clutch initiation for Great Gray Owls in southeastern Manitoba is 5 April (Bull and Duncan 1993). After this date, Great Gray Owls may not defend their territory as strongly (J. Duncan, pers. comm.). This may result in fewer responses to an audio call-back survey. Most responses, later proven to have originated from nesting pairs, occurred earlier in the survey period. Responses heard later in the survey period may have been produced by: non-breeding birds, males defending their territory (perhaps a distance from the nest), or courting birds that had not yet paired.

It was assumed that the mean clutch initiation date in Red Lake would approximate that of southeastern Manitoba. Efforts will continue to define the mean clutch initiation date for our study area. Once determined, this date

YEAR	NEST HABITAT DESCRIPTION	NEST TREE	NEST DESCRIPTION	NEST HT (metres)	REPRODUCTIVE SUCCESS
1993 * RL01	Black spruce/jack pine and poplar mixed wood (100yrs)	Dead poplar	stick nest in main crotch of tree	20	2 Fledglings adult female & two fledglings banded
1993** RL02	Jack pine/poplar/black spruce mixed wood ('91 blowdown)	Dead poplar	depression in top of broken off snag (tree snapped in half)	5.6	2 Fledglings 1 chick found dead at bottom of nest two fledglings banded
1993 RL03	Black spruce/jack pine mix	Dead poplar	depression at top of broken off snag (top half of tree snapped off)	10+	2 Fledglings adult female & two fledglings banded
1993 RL04	Mixed wood ('91 blowdown)	Live jack pine	stick nest in main crotch of tree	18+	Nest failed 1 egg found at the base of the nest tree adult female banded
1993 RL05	Mixed wood ('91 blowdown)	Dead poplar	depression at top of broken off snag	6	unknown
1994 RL06	Jack pine/black spruce mix	Dead jack pine	witches broom at top of tree	7.6	2 fledglings banded adult male
1994 * RL07	Mixed wood	Dead jack pine	witches broom at top of tree	8.6	unknown (at least 2 fledglings) banded 2 fledglings

* RL01 nest tree fell over in 1994. Pair relocated to RL07.

** RL02 vacant in 1994. Re-occupied in 1995.

Table 1: Great Gray Owl nests discovered in the Red Lake District 1993-1994.

YEAR	NEST LOCATION AND HABITAT	NEST TREE	NEST DESCRIPTION	NEST HT (metres)	REPRODUCTIVE SUCCESS
1964	Cochrane Mature Aspen	unknown	unknown	unknown	2 Fledglings
1976	Thunder Bay Poplar/white birch/jack pine	Live poplar	stick nest in crotch of tree	20 - 25	unknown 1 young observed in the nest
1977	Kenora Aspen stand	Live poplar	stick nest in main crotch of tree	20	unknown 1 young observed in the nest
1980	Moosonee Tamarack/black spruce fen	Live tamarack	man-made stick nest placed at the top of the tree	5	unknown 3 eggs in the clutch

Table 2: Accounts of historical nest records for Great Gray Owls in Ontario.
From: the Ontario Nest Records Scheme, Royal Ontario Museum.

may assist us to focus our efforts in order to increase the probability of receiving responses from nesting pairs and therefore document additional nests. In Red Lake, we are somewhat later than southern Manitoba in heralding the arrival of spring. Most roads in this area are not available to survey due to snow cover before 10 April. Assuming that the clutch initiation date (southeastern Manitoba) of 5 April is accurate for our area, when we receive a response from a paired female, there may be a good chance it will be sitting on a nest.

Nest Searches

The observations recorded during the 1993 nocturnal survey resulted in the discovery of four Great Gray Owl nests (Table 1). In all, five nests were discovered in 1993. In 1994, two new nests were found. A nest first documented in 1993 was re-occupied in 1995. All nests have been documented with the Ontario Nest Records Scheme (O.N.R.S.) at the Royal Ontario Museum, Toronto.

Three of the seven nests observed were located in the depression of a poplar snag. A severe windstorm in July 1991 resulted in the blowdown of 165,000 ha of forest (including a large part of the study area), flattening trees and snapping them off at mid-height. The result of this storm has made available additional nest sites from which Great Gray Owls can choose.

Historical Nest Records

Prior to the location of seven active Great Gray Owl nests in the Red Lake area, only four nests were on record for Ontario (Table 2). Family groups of Great Gray Owls were reported in three

blocks during the Ontario Breeding Bird Atlas Project (Prevett 1987), but no nests were found. Following the atlas, one adult and three fledgling Great Gray Owls were observed in Algonquin Provincial Park in 1989 (Forbes et al. 1992), but a nest was not located.

Conclusions

This survey garnered a great deal of response from five owl species, and once standardized, may well be an effective tool for monitoring long-term trends of specific owl species. For our purposes, this survey has proven to be effective in locating Great Gray Owl nests. We hope survey efforts will continue in order to achieve a better understanding of suitable Great Gray Owl nesting habitat.

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