The Ontario Great Gray Owl Invasion of 1983–84: Habitat, behaviour, food, health, age, and sex

by
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The following article is a summary of observations made during the 1983–84 invasion of Great Gray Owls in Ontario, with dates and locations of birds. Because of the general nature and short length of most reports I could seldom make correlations between different types of information; and obvious gaps result because no further data were provided. However, some very useful observations were recorded.

Perch sites

Deciduous trees (50) were noted as perch sites more frequently than coniferous trees (16). This may reflect the higher availability of the former, or the increased visibility of owls among bare branches. However, it may be that hunting owls select perches in deciduous trees for easier manoeuvrability and better acoustics (R. W. Nero, pers. comm.).

Owls seemed to make little effort to conceal themselves. They were noted perched on bare branches in trees 105 times, usually well out on branches, and almost as often in even less concealing situations. These included dead trees (32), utility poles (24), fence posts (13), overhead wires (9), snags (8), the tops of bushes (8), buildings of various sorts (6), stumps (2), guard rails (1), and stop signs (1).

Low perches were favoured over high sites. Small trees or bushes (21) were noted more often than tall trees (4); heights of perches were below 5m 12 times, between 5 and 10m ten times, and above 10m only three times. Utility poles and wires, fence posts, and stumps (62) could also be considered low perches. These low perches probably facilitated the location of prey by sound (Norberg 1987). On a couple of occasions, owls were noted flying closer to a place where they ultimately dropped to the ground, apparently getting closer to and locating the sound source more precisely.

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Only a few (4) observers specifically stated that birds perched near a road, but obviously those owls seen on utility poles, etc. (35) were also near roads. Some birds (12) were also noted near houses. There seems to have been considerable individual variation in the approachability of birds. Some observers commented that they were able to walk very close, while others noted that birds were very wary of humans. Unfortunately I could not correlate this behaviour with sex, age, or any other factor. Approachability may be increased when birds are hungry (Nero 1980, 1986), although few of the Great Gray Owls involved in the 1983–84 invasion were thought to be starving (see below). Birds may just have been preoccupied with something under the snow (Nero 1980), but this behaviour was not noted by the observers that were able to approach closely.

In three instances owls perched above bird feeders and on three occasions perched right on the feeders. Only one observer suggested that these owls were seeking small birds for food, but did not provide any specific observations to support this view. However, another observer noted that other birds flew close to an owl and were not bothered. Although the owls might have taken birds if they could, they were more likely seeking rodents attracted to spilled seed at the feeders (Nero 1980).

Habitats

Habitats occupied by the owls were divided into three general types: open (87), at the edge of open and wooded (80), and wooded (54). However, the distinction among the habitat types was not always clear, and results must be interpreted cautiously. For example, some observers indicated that the birds were at the edge of a road or were in fields, but gave no indication of whether the adjacent habitat was wooded or open. Likewise, observations in wooded areas usually did not specify whether adjacent habitats might have been different. There were relatively few observations of birds in wooded situations, compared to others where there was at least some type of opening. This may be very much biased by the ease of observation in the open, and those owls in wooded areas, in most instances, may have been near the edge of the woods.

Where specified, mixed deciduous/coniferous woodlands (42) were the wooded habitats in which Great Gray Owls were most often observed. This may also be biased by the fact that the majority of observations were made in regions of the province where mixed forests predominate. Deciduous woods (19) were utilized to about the same extent as coniferous woods (15). Swamp woodlands (29) were favoured slightly more than dry woods (20).

Among the open habitats, or open areas at the edge of woodlands, fields of various types

(100) greatly predominated over road edges (27), residential areas (14), marshes (10), ponds or rivers (5), young pine plantations (5), farmyards (4), beaver meadows (2), or "bogs" (1). Among the fields, abandoned and/or shrubby fields (31) were used slightly more than agricultural fields (28), but some of the latter were described only as open and may have had some shrubs as well. Scattered trees or utility poles would also have been a feature of most such agricultural fields. Unfortunately, 40 other fields were not further described.

Overall there does not seem to be any clear indication of a preferred habitat. The owls probably hunted largely in open areas, but had nearby woodlands for roosting or cover, and were less often seen there. However, almost any type of open area was used for hunting in proportion to its availability and according to the wariness of the individual birds or the availability of food.

Few Great Gray Owls were seen in urban areas during the 1983–84 invasion. One was observed in downtown Sault Ste. Marie, Regional Municipality of Sault Ste. Marie, in January 1984 perched on a building; this was the only owl noted in a place where trees, lawns, or fields were lacking. Another bird at Sault Ste. Marie was observed on a balcony railing, but details regarding the adjacent habitat were not provided. Four Great Gray Owl sightings were made in Orillia, Simcoe Co., but pay have referred to the same bird seen at different times and places. Gravenhurst, Muskoka District, and Lagoon City, Simcoe Co., also had single sightings.

Hunting methods

There were ten observations of birds plunging head downward into snow, as described by Nero (1980). Seven of these were recorded by one observer, who noted that the snow was about 45cm deep. Another noted that the snow was soft at the spot where this head first plunging occurred. Other observers noted holes in the snow that were presumably made by the owls, but did not actually see the birds hunting, or provide information on snow depth or firmness. The larger size of the Great Gray Owl and this particular head first plunging behaviour permit this owl to take prey in as much as 50cm of snow (Duncan 1987) and are thought to give them an advantage over the smaller Boreal Owl (*Aegolius funereus*) and Northern Hawk-Owl (*Surnia ulala*) in the Boreal forest in winter (Nero 1980).

Plunging into snow feet first was noted on fewer occasions (6). Perhaps this hunting technique was under-recorded because it was the more expected type of activity. No snow depths were given for situations where the feet first hunting method occurred. Only one observer noted a bird hovering (about 7m above the snow), although this is fairly typical hunting behaviour in more open

situations (Nero 1980).

On eight occasions observers noted that birds carried food (in the beak) to a perch to eat it. There is no indication that such food carrying was associated with courtship, and distances flown were not specified. Only one report of prey being consumed on the ground was received. Swallowing prey whole is the Great Gray Owl's usual feeding procedure, but only three people noted this behaviour. One person saw an item as small as a mole being torn apart for consumption, but an intact Star-nosed Mole (*Condylura cristata*) was found in one of the stomachs (see below). The distance from perch to capture site was noted on only nine occasions and varied from 5 to 15m, all relatively short distances.

Food

Most observers said that birds were "hunting", but gave no more specific indication of what that involved. One person watched an owl for several hours without seeing any hunting activity, while another saw as many as seven "mice" caught in one hour. Two squirrels (sp?) were observed to "play" in the same tree as an owl, while the bird just watched!

Most observers noted mice or voles (28) being taken by the owls, and such items constituted the bulk of the food found in the stomach contents examined (Table 1). Two people had sufficiently good looks at prey to identify them as Star-nosed Moles. Both Star-nosed and Hairy-tailed Moles (*Parascalops breweri*) were identified in stomach contents. This is perhaps not surprising, since moles are much the same size and colouration as the owls' usual prey. A small white animal was seen taken, which the observer suggested was either a young Snowshoe Hare (*Lepus americanus*), or an Ermine (Short-tailed Weasel, *Mustela erminea*). Since the observation was made on 3 January this prey would likely have been a weasel. Great Gray Owls have been known to take weasels (Brunton and Reynolds 1984), but this seems to be a rather unusual item.

One observer (Simcoe Co.) indicated that an owl was eating a "rabbit", and another (Peterborough area) a cottontail. These were both probably Eastern Cottontails (*Sylvilagus floridanus*). Cottontails are much larger than the usual prey taken by Great Gray Owls (Norberg 1987), and may have been road kills that were subsequently picked up by the owls. Scavenging behaviour has been noted (Nero 1980), and during the 1983–84 invasion one was seen feeding on a Beaver (*Castor canadensis*) carcass near a house (trappers?). Stomach contents from one owl also suggested scavenging, as it contained feathers, a leg, and lower mandible of what appeared to be a white, immature domestic chicken.

What may be more surprising is that the remains of 12 Meadow Voles (*Microtus pennsylvanicus*) can

Table 1: Contents of Great Gray Owl stomachs (9) and pellets (1) from the winter of 1983–84 in Ontario.

Location	Date	Age	Sex	Contents
Cochrane Dist.	20 Nov.	-	-	2 Masked Shrews (*Sorex cinereus*)
Cochrane Dist.	25 Nov.	-	-	4 Meadow Voles (*Microtus pennsylvanicus*)
Cochrane Dist.	30 Nov.	-	-	empty
Timiskaming Dist.	14 Nov.	-	-	1 Masked Shrew (*Sorex cinereus*), 1 Star-nosed Mole (*Condylura cristata*)
Timiskaming Dist.	— Dec.	Ad.	F	6 Meadow Voles (*Microtus pennsylvanicus*)
Timiskaming Dist.	11 Jan.	Ad.	F	12 Meadow Voles (*Microtus pennsylvanicus*)
Sudbury Dist.	— Nov.	-	F	8 Meadow Voles (*Microtus pennsylvanicus*)
Muskoka Dist.	20 Dec.	Ad.	M	1 young chicken (part)
Simcoe Co.	12 Jan.	Ad.	F	1 Hairy-tailed Mole (*Parascalops breweri*)
Simcoe Co.	11 Feb.	Ad.	F	1 Meadow Vole (*Microtus pennsylvanicus*) (pellet)

be accommodated in a single owl stomach (Table 1). However, the crania of all skulls were crushed and most smaller bones such as ribs seemed to have vanished.

An observer reported that an owl swooped at a domestic cat. Whether this behaviour actually constituted hunting for food (for a larger than usual prey item although the size of the cat was not specified) or an aggressive response was not clear. One owl attacked a blond-haired person (with no hat) at night. This may have been a mistaken attempt by a hungry owl to get food, for there seems little reason for an aggressive response to a human in mid-winter. Another owl was observed feeding on voles that were disturbed by someone ploughing snow from his driveway with a truck. The bird apparently caught six voles in a very short time, some within 3m of the truck. One bird was found eating a still-warm Northern Goshawk (*Accipiter gentilis*)! Unfortunately, there was no indication of how the owl had acquired this prey item, and it may have been scavenged.

Weather

Birds were seen in all types of conditions from completely overcast to full sun, and at temperatures ranging from -20°C to +20°C. Most observers noted that

winds were light or calm, as seems more usual (Nero 1980), but sometimes winds were recorded at speeds of 15 to 20km per hour. Snow depths ranged from none to 60cm. Some owls were present in the same area for a month or more and experienced all types of weather. There is no way to correlate various activities with any particular weather pattern, given the few observations provided.

Health of birds/mortality

More than 90 observers remarked that birds appeared healthy and alert. Unless a bird was obviously almost dead nobody looking at a "free flying" or perched bird ever suggested that it appeared to be in poor condition. Poor condition may have been possible to diagnose only in the hand, but the overwhelming evidence is that most birds were healthy everywhere they were seen. Of 23 examined in the hand, 18 were considered to be in good condition. One bird appeared to have a damaged eye, but was still alive and apparently healthy when seen on 11 April 1984. One person was tested for rabies after being attacked by an owl. No cause for the attack was suggested and tests were negative. While food shortages may have driven the owls from their normal haunts, they were obviously able to find areas of food abundance.

There were 51 Great Gray Owl deaths noted during the 1983–84 invasion. Road kills (18) were the largest single reported cause of mortality. Three others were listed as road kills or possible starvation. Since they were found near the road, they had probably been kit by cars also. The second largest cause of death was from shooting (9) and we can speculate that more birds were shot that were never reported. Other causes of death included traps (3), natural injuries (3), window kill (1), train (1), and hitting a wire (1). A couple of owls were found hanging in the crotch of trees, but whether they were initially caught there or fell there in weakened condition is not known. One bird was reported hanging by its feet from a "telephone" wire; no cause of death was suggested. Starvation was not implicated as a significant cause of mortality.

Owls were seen being harassed by American Crows (*Corvus brachyrhynchos*) on two occasions, by Blue Jays (*Cyanocitta cristata*) once, and by an American Kestrel (*Falco sparverius*) once. Although such harassment can be serious (Nero 1980), in one instance two crows "dive bombing" an owl did not even cause it to fly. It is unlikely that such harassment had any serious effect on the bird's health.

Plumage and moult

With a sample of only five adult birds, one missing one wing and two others missing part of their flight feathers, little can be said about moult. There was no consistent pattern of feather replacement of flight feathers, each bird having a distinct pattern of

new and old feathers in each wing. There was even a different moult pattern observed on the right and left wing of each bird. Among primary flight feathers there seemed to be two classes of feathers: new, and worn (probably one year old). Among the secondaries, however, there were usually three distinct classes: new, worn, and very worn and faded, suggesting that some had been retained for two years.

Sex and age

Few observers ventured to indicate the sex of the owls. Nineteen were thought to be female and eight male. Twelve dead birds were sexed by dissection, and ten of these were females, suggesting that the higher number of observed females was a real phenomenon. This is consistent with findings elsewhere that indicate that males tend to be much more sedentary than females (Duncan 1987; Hildén and Solonen 1987).

On the other hand, the age of birds (by plumage) was more frequently noted, and the overwhelming majority were adults (36) rather than immature birds (6). If most birds had been immature, one might have concluded that the young of a very successful breeding year were wandering or were forced by resident adults from natal areas because of competition for food or space. Movement of more juveniles than adults may be the usual situation during invasions (Hildén 1974). However, the strong showing by adults suggests that food stress was a more likely cause of the movement, as there is good evidence that young are probably the first to leave an area in times of food stress (Duncan 1987). The small number of young also suggests that 1983 may have been a poor year in terms of nesting success, with few young produced. This is a normal situation during a period of low food supply (Nero 1980), further indicating that food stress was likely a major cause of the movement.

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