

The 1995-1997 Great Gray Owl Invasions in the Peterborough Area

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Introduction

The Great Gray Owl (*Strix nebulosa*) breeds in boreal forest from the west coast eastward to Ontario and Quebec (Prevett 1987, Morneau 1996). It makes periodic flights in winter to southern Canada and the northern United States, including southern Ontario (Bull and Duncan 1993). I gathered records of Great Gray Owls from a large area around Peterborough during winter invasions in 1978-79, 1983-84, 1995-96 and 1996-97, as well as during more isolated occurrences in January-April 1992 and January 1993. The region from which sightings were collected during the 1995-1997 invasions included all of Peterborough County, west to Lake Simcoe (and Thorah Island), the Kawartha Lakes, and north and eastward into Haliburton and Hastings Counties. This article describes how reports of sightings were obtained, the number of reported owls in each invasion, and some characteristics of the owls observed.

Methods

My information on the dates and locations of Great Gray Owls during these invasions was derived in part through a "communications

network" developed while writing a weekly column on all aspects of the natural world and our relations with it in the *Peterborough Examiner* for nearly forty years. Reports also came in during the 1995-1997 invasions after three newspapers (in Peterborough, Lindsay and Bancroft), TV and radio ran items, often with my phone number and pictures of the owls. In 1997, flyers requesting information about the owls were posted in corner stores and other locations within the area, as well.

Significant information was fed to me through local personnel of the Ontario Ministry of Natural Resources. Much information came from dead birds reported to the MNR office; some came from taxidermists. Tim Dyson, an experienced bird bander and taxidermist who specializes in raptors, undertook efforts to band a number of the owls, which also yielded valuable data.

As a result of previous experience, during the last two invasions I kept detailed reports, pinning people down to specific sites, which I recorded in some detail with dates, and on a map. Quite rightly, people ask how I know they were all Great Grays, and how I was able to tell

that these represented separate birds. The answers are not unequivocal. However, no identification errors were detected. The owls were almost all seen along roadsides in daylight and allowed close approach. Many mentioned the great facial disks and yellow eyes. Most callers were not declared "naturalists"; certainly few had ever seen any kind of owl before.

But how did I tell whether these were new birds, repeats, or the same which had moved on? It was not always possible. But a number of factors helped. Some birds kept recurring at the same locations, often daily, over weeks. In many cases, when investigated this proved to involve two, often a pair as determined by size differential, or even as many as five birds. Sometimes these were all found on one visit. In 1997, along one stretch of road when out attempting to band the owls, Tim Dyson saw no fewer than seven, with five in view at one time. Road kills and dates helped in an estimate of the number of owls at any one location.

Birds were sometimes captured for banding at the same place, and their recorded characteristics compared. An intuitive estimate of the size of winter territories quickly developed and events seemed to back this up. As a rule of thumb, birds found two or more kilometres apart were counted as different, once the invaders appeared to have settled down to a temporary stabili-

ty. Brunton and Pittaway (1971) noted that invading Great Gray Owls near Ottawa "set up definite home ranges" (one of which was approximately 112 acres), "and tended to stay within those boundaries".

No doubt there were unavoidable errors, but these were countered by presumed cases where multiples were not detected, and by the probability that many owls not visible from the car or roadside were missed. It became obvious that most sightings came from travelled routes. The estimate of numbers was almost certainly conservative.

Numbers of Owls

During the winter of 1978-79, I had records of 34 Great Gray Owls. Estimates of the total number of Great Grays in all of southern Ontario that winter ranged from 61 (Goodwin 1979) to at least 112 (Vickery and Yunick 1979). In 1983-84, my recorded sightings increased to 97 owls. James (1989a) noted that 407 Great Gray Owls were reported to the *American Birds* Ontario Region editor that winter, in a flight that "exceeded in numbers any previously-recorded movement" in eastern North America.

In the winter of 1995-96, we watched in astonishment as numbers climbed steadily to more than 330 different Great Gray Owls in my study area. Ridout (1996) later reported: "Great Gray Owl sight-

ings totalled >600 birds across s. Ontario during March. This conservative estimate places this past winter's s. invasion as likely the largest ever experienced in the province." In 1996-97, a completely unexpected 265 owls appeared here, as an "echo flight" occurred that was almost as large as the previous winter (Ridout 1997). We were astounded at the unprecedented response of those reporting during these invasions. My wife and I were overwhelmed. At the beginning, the phone never stopped ringing; we had to take it off the hook over supertime in order to eat!

The map that resulted from all this action showed a concentration of sites just south of the edge of the Shield (with more isolated sites along the north and south fringes). This distribution was probably partly because it included marginal lands with open areas suitable for rodent hunting, but not much unbroken forest, similar to the

habitat used by these owls near Ottawa reported by Brunton and Pittaway (1971). It also had a better road network and more people occupying all-year homes, thus more road traffic to provide sightings. A further, very significant factor was that it was where local media had the most effective coverage. The reporting pattern was in fact to a large degree an artifact of all this rather than an actual and impartial picture. We might assume that the total area and intensity of the invasion were much broader than I was able to record.

The occurrence of messages reporting different sightings, by month, for the invasions of 1995-96 and 1996-97, is presented in Table 1. The last report in the 1995-96 invasion was on 15 June, while a roadkill reported on 16 May was the last in the 1996-97 flight. As the latter bird had a worn tail, it may well have been a release from hospitalization.

The figures in Table 1 should be

Table 1: Occurrence of messages reporting Great Gray Owl sightings by month

Invasion	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total Messages
1995-96	1	3	2	2	44	271	86	11	5	425
1996-97	1	0	2	24	211	67	24	2	0	331

interpreted with caution, since callers would obviously report their initial sightings, but only rarely subsequent ones (let alone their last one), in spite of my requests that they do so. However, I learned to ask whether the report was the

caller's first, and quite often learned about previous sightings of the same or another bird.

It is hard to tell how many casualties there were since not all would be noticed or reported. At least 15% of recorded owls became

known traffic victims in 1995-96, with fewer reported the next winter. Twenty-seven dead Great Gray Owls were reported to the MNR from the district over the winter of 1996-97.

Age and Condition

Evidence of plumage in captured or injured birds, as well as observations in the field from 1995-96, tend to show that most were fledged in 1994. Was this a particularly good year for nest success in the north woods? It seems that immature birds may be the first to be forced out when food is in short supply, followed by females (Duncan 1987). Established males are most likely to remain behind. Those that stay back often die of starvation (Duncan and Hayward 1994). Plumages noted in 1997 showed that far more were rather older birds. Perhaps some were the same young birds that arrived in 1996 but a year older and wiser, occupying territories they found productive the previous season. Seven respondents noted that birds appeared at exactly the same place each year (even the same lookout posts). Probably others did not bother to report such a happening.

Most fatalities examined were in good physical condition. Only a small handful had died of starvation; this might have been allied to disease or ageing, since food seemed plentiful. Other information that might be secured from

such sources in future includes sex, age, breeding readiness, and variations in plumage.

Duration of Invasions

In view of the unexpected way that some owls lingered, even into June in 1996, there was widespread speculation as to whether some might stay to breed. Breeding has been known on some rare past occasions in southern Ontario (Forbes et al. 1992). A report surfaced in April 1997, when an owl was reported, that the caller had seen one in July 1996 in the same locality. But no hard evidence of summer occupation has surfaced. Few signs of awakening sexual activity were reported, but toward the end some owls appeared more closely paired, and there were two reports of interactive flight display, and also unusual hooting calls which may have been from this species. One owl was seen by Peter Burke turning "feet up" at an intruding individual on 29 March 1997.

Food

Great Gray Owls prey primarily on small mammals, especially rodents (James 1989b), and "voles (*Microtus* spp.) dominate their diets over most of their range" (Duncan and Hayward 1994). Such examination as we were able to do of food pellets and of the stomach contents of fatalities generally conformed to these findings, but also included some less usual prey.

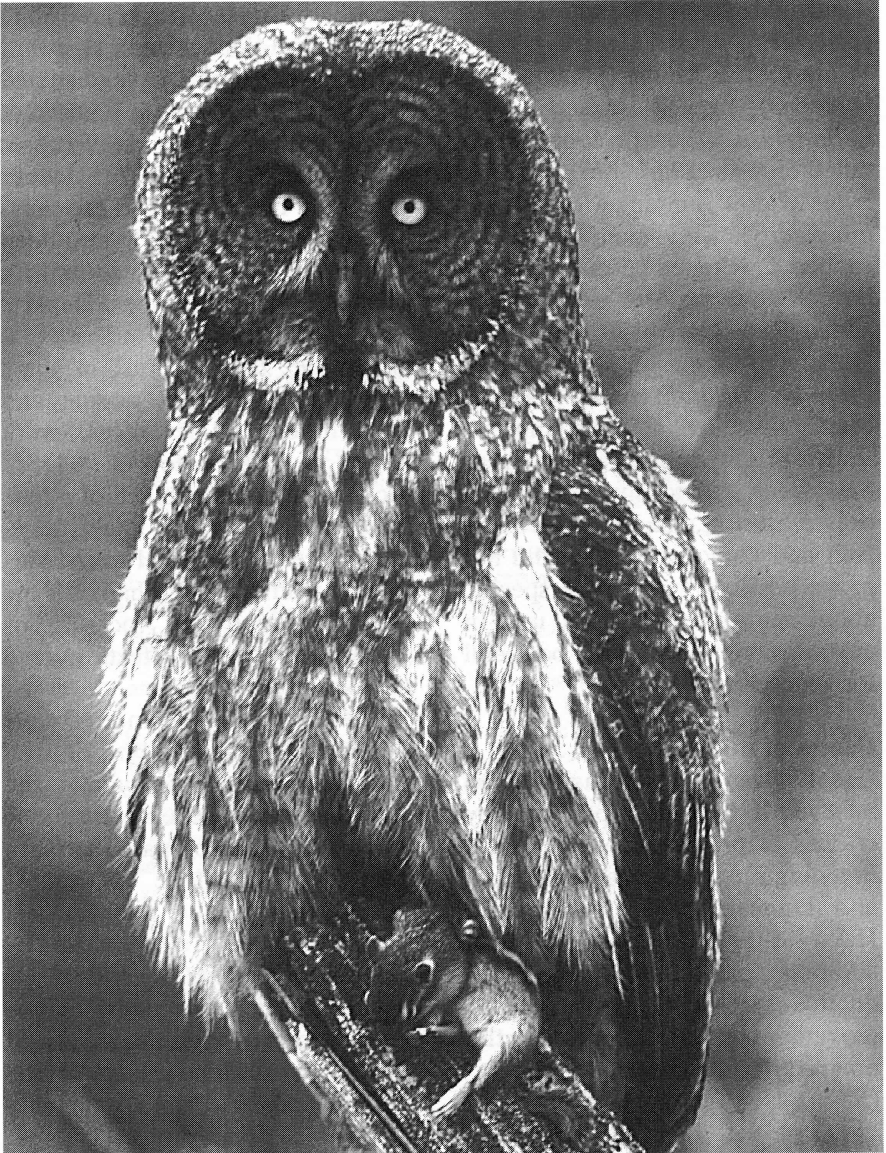


Figure 1: Great Gray Owl with Eastern Chipmunk, north of Kirkfield, 25 May 1996.
Photo by *Sam Barone*.

Two pellets and ten stomachs were examined. Those from birds

under treatment were ignored. Four stomachs were empty. The remain-

der yielded: 14 Meadow Voles (*Microtus pennsylvanicus*), one White-footed Mouse (*Peromyscus leucopus*), two Star-nosed Moles (*Condylura cristata*), four Short-tailed Shrews (*Blarina brevicauda*), two Meadow Jumping Mice (*Zapus hudsonius*), and even a Black-capped Chickadee (*Parus atricapillus*). Visual reports of captures added Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Chipmunk (*Tamias striatus*), and Ermine (*Mustela erminea*). While unusual, squirrels, chipmunks and weasels have been previously reported as prey (Brunton and Reynolds 1984, Bull and Duncan 1993). It did not prove possible to be more specific about seasonality of prey use. In any case, numbers were too small for generalization.

Causes of Invasions

Great Gray Owl invasions are believed to be caused primarily by crashes of prey populations in the breeding range (Duncan 1987, Bull and Duncan 1993, Duncan and Hayward 1994, Pittaway 1997). In addition, "particularly good reproductive success of owls prior to movements may accentuate the magnitude of their invasions" (Shuford and Desante 1979).

There has been frequent speculation that snow depth and crusting in the north would affect availability of food for these owls and result in southward flights (e.g., Shuford and Desante 1979, Kaufman 1997).

However, Robert Nero (1980) and Jim Duncan (Duncan and Hayward 1994) in Manitoba have disputed this assumption, pointing out that there are at times movements northward to places of deeper snow; and that these owls are capable of diving successfully into deep snow (45 cm) and even snow with substantially iced layers. Reports from northern Ontario indicate that in 1995-96, the icy crust in some areas was such that people and even moose (*Alces alces*) were forced to walk on top of it. Deep snow itself is not as much of a hazard to the owls as we might think, since mice often tunnel to the surface for ventilation. Perhaps it is the added difficulty in locating or reaching prey that affects overall success.

There is much we do not yet fully understand about this bird of mystery. We must look forward to the next invasion, whenever that may be, and be better prepared to learn from it. It should be an exciting experience.

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