An Influx of the Northern Hawk Owl in Thunder Bay District

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During the past 25 years, I have travelled extensively throughout Thunder Bay District in search of birds, and, although references (Godfrey 1986, Duncan and Duncan 1998) indicate that this entire area is within the breeding range of the Northern Hawk Owl (*Surnia ulula*), I have rarely encountered this species during the breeding season.

This situation changed, however, about six years ago, with two back-to-back invasions of this species, and during the spring and summer of 2001, we had an unprecedented number of breeding season reports. In this article, I describe eight nests that I found from 1998 to 2001, with some observations on the habitat and behaviour of the Northern Hawk Owl, and brief comments on the 2002 breeding season.

Historical Perspective

The only information available from prior to the 1980s comes from anecdotal reports in the newsletter of the Thunder Bay Field Naturalists (TBFN) and related publications by TBFN members. In the early 1900s, the Northern Hawk Owl was frequently seen in fall migration (Dear 1940), but it would appear that this species then became quite uncommon. In the two decades from 1939 to 1958, this owl was listed in the TBFN News Letter in only nine years, with no more than one or two reports per year.

There was a hawk owl "invasion" into the southern parts of northwestern Ontario in the winter of 1958-59 (Allin 1959), and birds were frequently seen thereafter through 1963. Reports then dropped off again, with no sightings reported in 11 of the next 24 years. Reports picked up a bit from 1988 to 1992, all in the migration and winter seasons. There were only two reports from 1993 to 1995.

Nesting records are few. Lionel S. Dear, on the basis of 30 years' observations in the first half of the twentieth century, considered the Northern Hawk Owl a "very rare summer resident" in the vicinity of the Lakehead (Dear 1940). There are only four previous breeding records in Thunder Bay District: one in O'Connor Township, west of Thunder Bay, in 1926 (Dear 1940); one from Auden, east of Lake Nipigon, in 1957 (Allin 1959); one at Hemlo near Marathon in 1958 or 1959 (P. van Kerkoerle, pers. comm.); and one about 8 km north of Geraldton in 1972 (D. Elder, pers. comm.).

Dave Elder (pers. comm.) found the latter nest, north of Geraldton, on 21 May 1972, in an

area that had been burned a couple of years before (i.e., the Greta Lake Fire). The burn was still fairly open, with early successional grasses, shrubs and raspberries (*Rubus* sp.) as ground cover. The nest was in a hollow in the top of a fire-killed birch (*Betula* sp.) about 6 m tall. Elder saw one adult fly to the nest stub, and then another adult emerged from the nest.

There were no breeding records of the Northern Hawk Owl in Thunder Bay District during Ontario's first breeding bird atlas, which spanned the 5-year period 1981-85 (Weir 1987).

The Current Influx

The first sign that this species might be increasing in numbers in our area came when one was seen at the Thunder Cape Bird Observatory on 13 September 1996, only the second for Thunder Cape in its six year history. There were frequent sightings from various locations that fall, and two were tallied on the Thunder Bay Christmas Bird Count, 26 December, only the seventh time the species had been recorded in 56 years of CBCs.

The next summer, 1997, Brian Moore spotted a hawk owl in June near Black Sturgeon Lake, and a subsequent visit yielded a group of recently fledged young in addition to one parent (Figure 1).

The next spring, 1998, I found two nests in the same area, 3.5 km apart. One of them was only 2.5 km from the previous year's breeding site. One (#1998-1; see Table 1) was on the top of a broken-off birch (*B. papyrifera*) stub (Figures 2 and 3); the other (#1998-2) was in a burned-out cavity in the side of a Balsam Poplar (*Populus balsamifera*) (Figures 4 and 5). Hawk owls were scarce for the next two years, but during the fall and winter of 2000-2001, there were numerous sightings of hawk owls in the vicinity of Thunder Bay, and birds on territory were seen starting in late winter. I concentrated my search for breeding pairs in two areas where birds seemed to be the most dependable: the area near Black Sturgeon Lake where the 1998 nests had been found; and logging clear-cuts north and west of Raith, about an hour's drive northwest of Thunder Bay. In the Black Sturgeon area, I found two nests (#2001-3 and #2001-5), only 2 km apart (Figures 6 to 9). They were at the same place as the 1998 nests, but in different trees. One of the nests (#2001-5) was in clear view of a 1998 nest tree (#1998-2). In the Raith area, I found three nests, two of them (#2001-1 and #2001-2) only 4.5 km apart (Figures 10 to 13), with the other (#2001-4) 13 km to the west, on the south shore of Muskeg Lake (Figures 14 and 15).

In addition, I checked out a tip from a Nipigon MNR employee who had seen a hawk owl in a clear cut at Shook Lake, south of Black Sturgeon Lake, and I found a nest (#2001-6) there also.

Figure 1: Two juvenile Northern Hawk Owls, family #1997-1, panting in the mid-day heat, Black Sturgeon area, 29 June 1997. Photo by *Nicholas G. Escott.*

Figure 2: Nest tree for Northern Hawk Owl nest #1998-1, Black Sturgeon area, 3 May 1998. The nest is in the top of the tall stub in the centre background. Photo by *Nicholas G. Escott.*

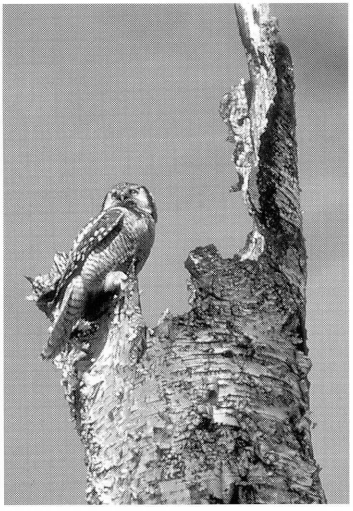

Figure 3: Male at nest #1998-1, 3 May 1998. It has just given a prey item to the female, which is hidden in the top of the stub. Photo by *Nicholas G. Escott.*

Figure 4: Nest tree for Northern Hawk Owl nest #1998-2, Black Sturgeon area, 3 May 1998. The nest cavity is halfway up the right hand tree of the twin trees in the centre of the picture. Photo by *Nicholas G. Escott.*

Figure 5: Pair at nest #1998-2, 3 May 1998. The male has brought prey to the female, which is sitting in the shadows, probably on recently hatched young. Photo by *Nicholas G. Escott.*

Figure 6: Nest tree for Northern Hawk Owl #2001-3, Black Sturgeon area, 18 June 2001. The nest cavity is in the side of the tree, just above the horizon in the background. Photo by *Nicholas G. Escott.*

Figure 7: Juvenile Northern Hawk Owl in nest cavity #2001-3, 18 June 2001. Photo by *Nicholas G. Escott.*

Figure 8: Nest tree for Northern Hawk Owl nest #2001-5, Black Sturgeon area, 18 June 2001. The nest cavity is half way up the trunk, where a large branch had previously broken off. Photo by *Nicholas G. Escott.*

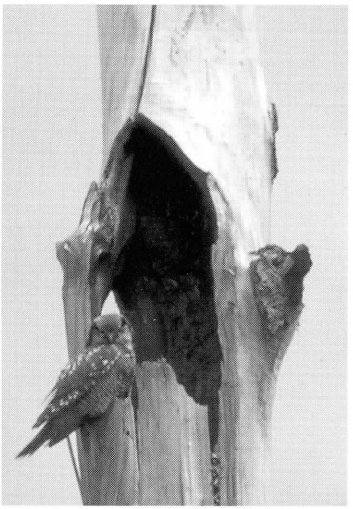

Figure 9: Male at nest #2001-5, 18 June 2001. Several juveniles had already left the nest; any remaining were hidden from view in the cavity. Photo by *Nicholas G. Escott.*

Figure 10: Nest tree for Northern Hawk Owl nest #2001-1, near Raith, 27 April 2001. The nest cavity is an enlarged old woodpecker hole, near the top of the stub. Photo by *Nicholas G. Escott.*

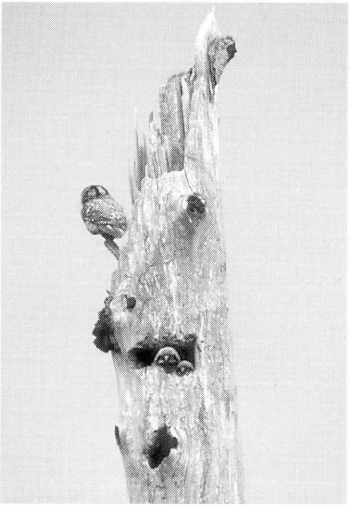

Figure 11: Female and juvenile at nest #2001-1, 19 June 2001. At least one juvenile had already left the nest. Photo by *Nicholas G. Escott.*

Figure 12: Nest tree for Northern Hawk Owl nest #2001-2, near Raith, 28 April 2001. The nest is in the top of the broken-off birch tree in the centre of the picture. Photo by *Nicholas G. Escott.*

Figure 13: Female on nest #2001-2, 28 April 2001. Only her tail can be seen sticking out from the top of the tree trunk. Photo by *Nicholas G. Escott.*

Figure 14: Nest tree for Northern Hawk Owl nest #2001-4, near Raith at Muskeg Lake, 16 May 2001. The nest cavity is in the tall stub just right of centre, on the back side near the top where the remaining large branch originates. Photo by *Nicholas G. Escott.*

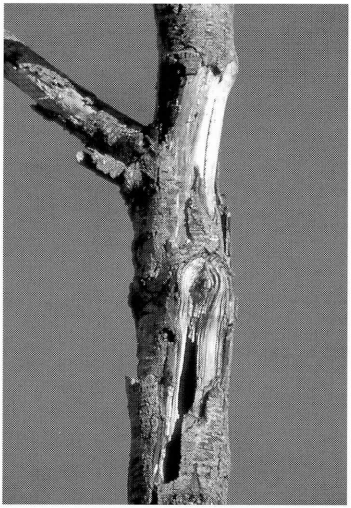

Figure 15: Nest cavity for #2001-4, where a large branch had broken off. The female entered and exited through the upper part of the hole, with some difficulty. Photo by *David Welbourne.*

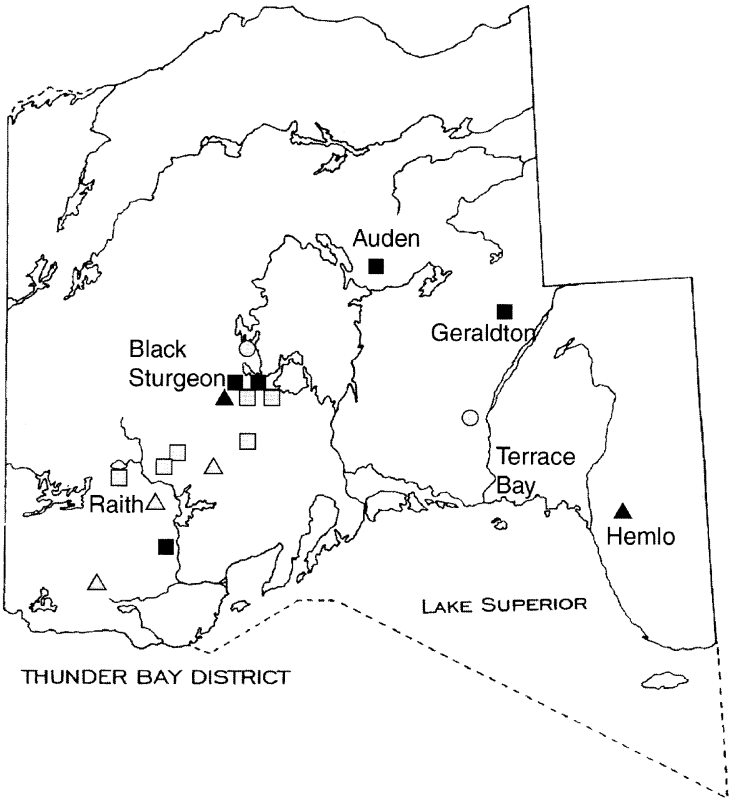

Figure 16: Map of Thunder Bay District showing locations of 2001 (grey symbols) and pre-2001 (black symbols) breeding records for the Northern Hawk Owl. Squares are nests, triangles are family groups, and circles are single birds seen during the breeding season. See text for details.

Following is a chronology of the visits to each nest site:

Family 1997-1, Black Sturgeon
June 29 one adult hunting; 3 juveniles calling, barely able to fly

Nest # 1998-1, Black Sturgeon
April 10 female on nest calling (heard only); male hunting, brought vole
April 19 female seen on nest; male heard ululating nearby
May 3 female on nest; male hunting, brought vole; both called
May 18 4 juveniles in nest; no adults seen (1700h)

Nest #1998-2, Black Sturgeon
April 19 male ululating
May 3 female on nest; male ululated, brought prey; both called
May 18 3 juveniles in nest, 2 on the ground; male brought food to female

Nest #2001-1, Raith
April 1 pair seen: male hunting, female sedentary in top of birch tree
April 13 male hunting
April 15 male hunting
April 25 male hunting; female left nest to receive food item
April 27 male and female seen
May 17 female left nest to receive food from male, who ululated once
June 5 male hunting; female brought cached food item and fed young in nest
June 19 2 juveniles in nest, one on the ground; female loafing, hunting

Nest #2001-2, Raith
April 27 male seen, hunting
April 28 male ululated once; female sitting on nest, left once to receive food
May 17 female seen on nest
June 4 no birds seen
June 19 no birds seen

Nest #2001-3, Black Sturgeon
May 10 female on nest; male brought food item
June 6 male hunting; female left nest to bring food item back
June 18 1 juvenile in nest; adult nearby

Nest #2001-4, Muskeg Lake, near Raith
May 16 male hunting and loafing; female left nest once to stretch and defecate
May 17 no birds seen
June 4 female seen and calling near nest; 2 juveniles seen in nest (probably more)
June 19 no birds seen

Nest #2001-5, Black Sturgeon
June 6 male brought food to perched female; she called and took food to nest
June 18 at least 3 juveniles on ground, 1 could barely fly; female feeding them and visiting nest with food; male brought food items to female

Nest #2001-6, Shook Lake
June 9 female calling, feeding juveniles on ground and in nest; male brought food

Table 1: Comparison of nest site locations for the eight Northern Hawk Owl nests.

Nest #	Date found	Height (m)	Type of tree	Location in tree	Outcome
1998-1	10 April 1998	13	White Birch stub	Burned-out top	4+ young
1998-2	3 May 1998	10	Balsam Poplar	Hole burned in side	5 young
2001-1	25 April 2001	10	Trembling Aspen (*P. tremuloides*)	Old woodpecker hole	3+ young
2001-2	28 April 2001	18	White Birch stub	Broken-off top	failed
2001-3	10 May 2001	5	Balsam Poplar	Hole burned in side	1+ young
2001-4	16 May 2001	25	Trembling Aspen	Hole in side	2+ young
2001-5	6 June 2001	10	Trembling Aspen	Hole burned in side	3+ young
2001-6	9 June 2001	10	poplar/aspen	Old woodpecker hole	2+ young

In addition to the nests described above, Northern Hawk Owls were seen by several observers in other locations during the 2001 breeding season (Figure 16). In July, family groups of fledged young were found 75 km up Highway 527; near Marks Lake west of Thunder Bay; and southeast of Raith in Abitibi block 3. Also, individual birds were seen during the breeding season at Gull Bay on Lake Nipigon, and north of Terrace Bay.

Observations on Behaviour

The males did most or all of the hunting, particularly once the female was sitting on eggs. While incubating the eggs, the female would usually leave the nest to receive a food item from the male at a nearby tree or stub, and return to the nest several minutes later. After the young had hatched, the male usually brought the food to the nest. Nearly all the prey items I observed were voles, probably meadow voles (*Microtus pennsylvanicus*). Juveniles would start leaving the nest one by one before they could fly, and were usually sitting on the ground, or had climbed up a short stick or branch, where they would wait for the female to feed them. Often, the male would bring a food item and cache it on a stub or near the top of a live conifer. The female would go and retrieve it later.

Vocalizations

The most common call was a raspy *burrrrrr-WHEEP*, the first part lower-pitched and drawn out, the second part short, emphatic, and higher pitched. Both adults gave this call, apparently as a means of communication. The male would often announce his presence with this call when he returned with food. The young gave the same call, but higher pitched, in and out of the nest, calling back and forth with the female, probably for food. This call is so characteristic that I was able to locate a new pair by hearing the sound before I saw any birds. I believe this is the alarm or screeching call described as *screeeeee-yip*

(Duncan and Duncan 1998), but the birds did not seem to be alarmed by my presence and carried on their usual activities while giving this call.

Sometimes the male would give a clear tremulous low-pitched whistle reminiscent of the hoot of the Boreal Owl (*Aegolius funereus*). This was the "ululation", or display call, of the male. Males were usually loafing on a high exposed perch close to the nest when they ululated, and seemed oblivious to my presence. One male sang with a vole in his mouth.

Females uttered a definite alarm call when I unwittingly came too close to a juvenile on the ground. This was a series of staccato single notes *quik quik quik*. One bird gave this call when a Bald Eagle (*Haliaeetus leucocephalus*) flew over. Another female, who was perched near the nest, gave the alarm call when she saw two male Northern Harriers (*Circus cyaneus*) circling above. Suddenly, the male appeared and circled up, buteo-fashion, to meet the hawks, whereupon he started diving at them until they had drifted away from the area.

Two other types of calls were heard once only. The first was a series of one-syllable squeaks uttered by one member of a pair, probably the male, with his mouth wide open. He was hunting some distance from his nest, when he came in sight of the female of the neighbouring pair, which was perched near her nest and giving the screeching call. He left without a confrontation. The most peculiar vocalization was a twittering, reminiscent of the Chimney Swift (*Chaetura pelagica*), given by a female while hunting near the nest; at least one juvenile was on the ground at the time, while the others were still in the nest.

The Habitat

Several features seem to be common to all nest sites. First, the situation of the nest was in a large standing dead tree with a suitable cavity. The cavities were of various types, and at variable heights (Table 1), but all were in fairly large dead trees.

Second, the nests were located in open areas with a graminoid ground cover that supported a large vole population. In this part of northern Ontario, such open areas are the result of logging operations. But tree harvesting alone is not sufficient to produce appropriate habitat, since "weed" tree and shrub species regenerate quickly. An additional insult is required: either fire or herbicide. Herbicide is used by the forest industry on tree-planted areas because it kills fast-growing broadleaf species, thus releasing the planted conifers from competition. In addition, it allows grasses and sedges to grow. Fire has a similar effect on regenerating vegetation, but, unfortunately for the foresters, it kills the planted trees also. The area west of Black Sturgeon Lake, which produced at

least five hawk owl nests over the 1997-2001 period, was logged in 1990-91 and re-planted, but then was burned by a wild fire in 1996. It was planted again and parts were sprayed with herbicide in 1996-97. The Shook Lake hawk owl nest was in an area that was harvested in 1989-90, and was hit by a wild fire in 1996. It was subsequently re-planted and herbicided. The nests in the Raith area were in sites that had been logged and herbicided, but not burned.

Third, all nests were in quiet undisturbed areas with little human activity. The nest that failed was near a logging road that was quiet until May when a new tree harvesting operation started just up the road. I do not know why the birds deserted this site, but the constant noise and dust made by the machines and pulp trucks may have been a factor.

Prior to forest harvesting operations in Thunder Bay District, what was the natural habitat of the Northern Hawk Owl? Graminoid fens are the only natural grassy areas here, but I have never seen a hawk owl in the summer in such habitat. Perhaps the rodent population is too low, and/or there are no suitable nest sites. Or perhaps these areas are too wet, although one of the birds seen in the summer of 2001 was hunting in a wet marshy area.

A single forest fire might produce suitable habitat; two of the hawk owl sightings were in recent burns, but I was not able to find a nest in these areas. In these burns, most trees are still standing and the understorey usually grows back thickly within a year, but in some areas the ground cover is left more open.

The year 2002

Hawk owls remained common in the Thunder Bay area over the winter of 2001-2002, with peak numbers recorded in mid-March (e.g., 26 counted over the weekend of 16-17 March in two different areas). Numbers gradually dropped off after that, but a few individuals stayed into the breeding season.

Four nests were found in May, three additional recently fledged family groups (one with six juveniles) were found in June and July,

and adult birds were seen at several other locations. All 2002 nests were in logging cutovers, some of which had been treated with herbicide, while the others were in more recent cuts with little ground cover. Three of the nests were in the tops of broken-off birch (2) and Trembling Aspen (1) stubs, and one was in a cavity in the side of a tall dead aspen. All four nests and two of the family groups were located close to Highway 527 (the Armstrong Highway), between 25 km and 80 km north of the Trans-Canada Highway (Highway 11/17). The other family group was at the site of nest #2001-1 near Raith.

It is apparent from these observations that the Northern Hawk Owl has maintained a strong breeding presence in the southern part of Thunder Bay District in 2002.

Acknowledgements

Brian Moore's sighting in June 1997 started me on the search for hawk owl nests, and Margaret Carruthers spotted the Shook Lake owl and provided background information on the Black Sturgeon and Shook Lake harvesting and regeneration operations, and fire history. I wish to thank them both particularly, and also Dave Elder and Peter van Kerkoerle for their breeding records, and Matt Hindle, Ryan Polson, Rob Swainson, and George Williams for their sightings during the summer of 2001. Thanks also to David Welbourne for his hawk owl sightings and photographs, and for finding one of the 2002 nests. George Holborn, Brian Moore and Barry Atkinson contributed some 2002 sightings.

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