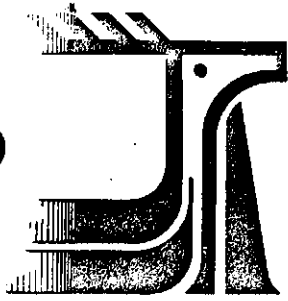


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Committee
on the Status
of Endangered
Wildlife
in Canada

Comité sur le
statut des espèces
menacées
de disparition
au Canada

Ottawa, Ont. K1A 0H3
(819) 997-4991

**STATUS REPORT ON THE NORTHERN HAWK OWL
SURNIA ULULA**

BY



PATRICIA A. DUNCAN

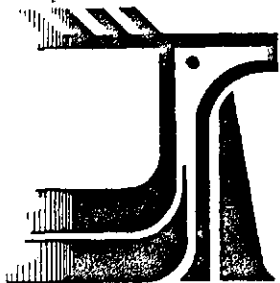
STATUS ASSIGNED IN 1992
NO DESIGNATION REQUIRED

REASON: NO DEMONSTRATED THREAT TO THE POPULATION IN THE MAIN PART OF THE SPECIES' RANGE. NO DEMONSTRATED CONTINUED DECLINE ALTHOUGH HISTORICALLY IT HAS NO DOUBT BEEN REDUCED IN NUMBERS.

OCCURRENCE: ALBERTA, BRITISH COLUMBIA, NEW BRUNSWICK, NEWFOUNDLAND, NORTHWEST TERRITORIES, ONTARIO, QUEBEC, SASKATCHEWAN, YUKON TERRITORY

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STATUS REPORT ON THE NORTHERN HAWK OWL
SURNIA ULULA

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PATRICIA A. DUNCAN

BOX 201
CRAVEN, SASKATCHEWAN
SOG OWO

STATUS ASSIGNED IN 1992
NO DESIGNATION REQUIRED

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A. ABSTRACT

The Northern Hawk Owl (Surnia ulula) is widely distributed across the boreal forest region of Canada. Since it normally breeds in remote areas, experiences cyclic population fluctuations, and has always occurred at low densities, determining the population status and trends of this species is extremely difficult. Anecdotal evidence suggests that recent periodic invasions southward have consisted of fewer individuals compared to those of the 1800's and early 1900's, and that over the long-term, there has been a decrease in the numbers of Hawk Owls in Canada. Recent population trends are unknown.

The Hawk Owl is vulnerable to shooting, accidental trapping along trap-lines, and perhaps to habitat loss in some portions of its range. These factors are probably not detrimental to the Canadian population. The majority of the population likely occurs in the Forest and Barren region of the Boreal Forest. These areas are virtually free of commercial logging. Recognizing the lack of knowledge of the basic biology of the Hawk Owl, it is recommended that this species be placed "Not in any category."

B. NORTH AMERICAN BREEDING DISTRIBUTION

1. Current North American Breeding Distribution.

"Breeds in North America from the limit of trees in western and central Alaska, central Yukon, northwestern and central Mackenzie, southern Keewatin, northern Manitoba, northern Ontario, northern Quebec, central Labrador, and Newfoundland south to south-coastal Alaska, southern British Columbia, south-central Alberta, central Saskatchewan, southern Manitoba, northern Minnesota (and perhaps rarely northern Wisconsin), northern Michigan, south-central Ontario, southern Quebec, and New Brunswick." (Johnsgard 1988) (Fig. 1). Bent (1938) noted that it may have bred in Montana (Madison River and Summit), northern Idaho (Stanley Butte), Minnesota (Isle Royale) and northern Michigan. Terres (1982) reported the Hawk Owl as casual in summer to Idaho and Montana.

Johnsgard (1988) described its' wintering range in North America as irregularly extending southward to southern Canada and northern Minnesota, and casually to western Oregon, Idaho, Montana, South Dakota, Iowa, Wisconsin, southern Michigan, northern Ohio, Pennsylvania and New Jersey. Terres (1982) added that the Hawk Owl is a casual winter visitor to Washington, northeast North Dakota, Illinois and Connecticut. Bent (1938) included rare winter visits to Massachusetts, Rhode Island, Long Island and western New York. He also noted a Hawk Owl as far

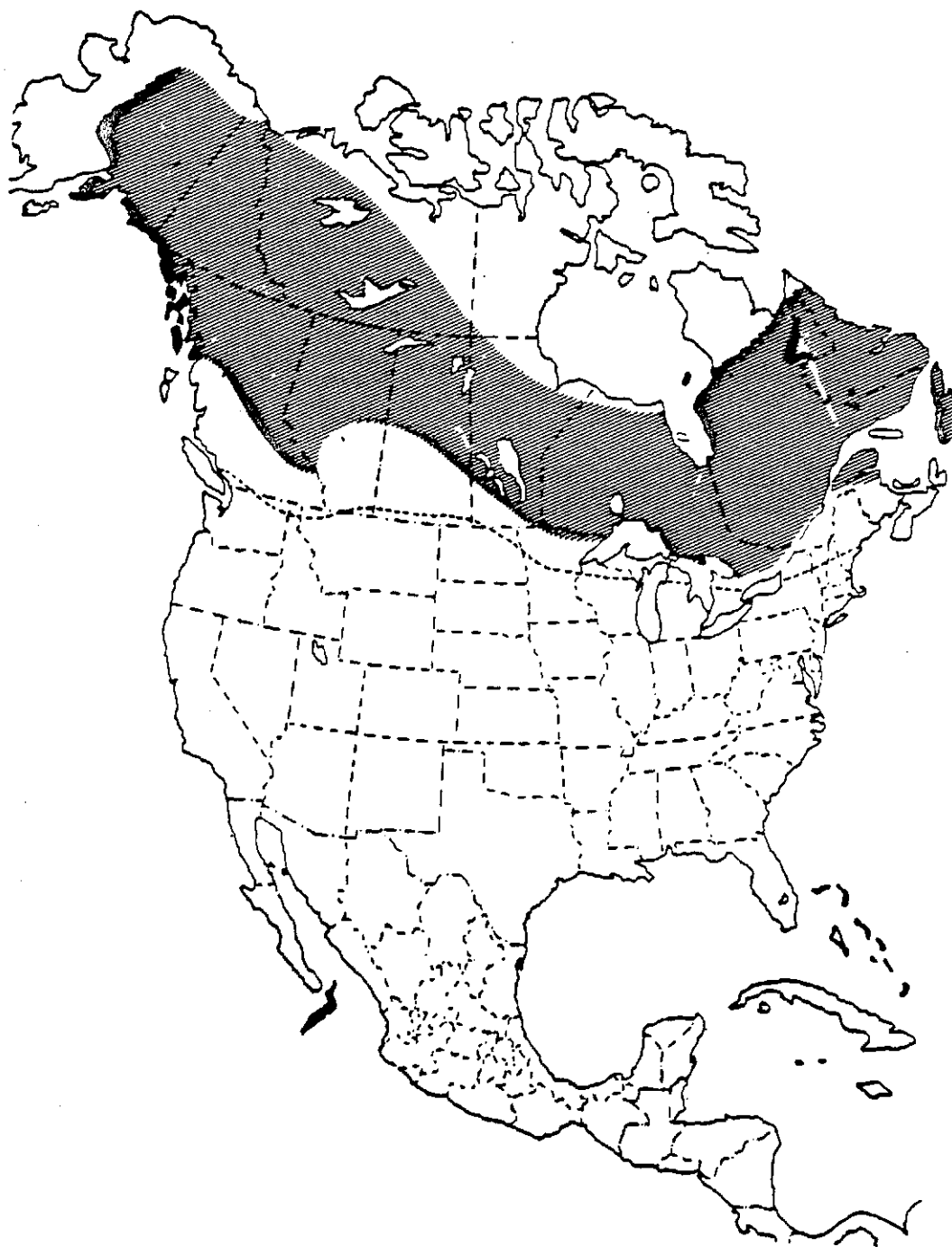


Fig. 1. North American breeding distribution of the Northern Hawk Owl. The dashes indicate usual southern limits of wintering vagrants. (From Johnsgard 1988)

south as Raymond, Nebraska in November 1891, where it was shot. The A.O.U. Checklist (1957) included Raymond, Nebraska as part of the casual winter range of the Hawk Owl. Usually, it rarely extends beyond the northern United States.

2. Canadian Breeding Distribution

The breeding distribution of the Northern Hawk Owl is described by Godfrey (1986) as:

"Breeds (north to tree limit) from northern Yukon (Lapierre House, Old Crow); northwestern and central Mackenzie (Mackenzie Delta, Anderson River, Great Slave Lake); northern Saskatchewan (Lake Athabasca); northern Manitoba; northern Ontario; northern Quebec (Kuujuuaq, Hutte Sauvage Lake); central Labrador (Okak, Udjuktok Bay), and Newfoundland south locally to southern British Columbia (Atlin, Peace River region, south to Tod Mountain, situated 40 km northeast of Kamloops, and Manning Provincial Park); south-central Alberta (near Banff, probably Red Deer); central-eastern Saskatchewan (Hudson Bay Junction); southern Manitoba (Riverton, Kalevala near Mulvihill); Ontario (Sutton Ridges, Thunder Bay, Parry Sound, Ottawa, perhaps Cameron); southern Quebec (Lochaber, Gaspé Peninsula); and New Brunswick (rarely: Tabusintac)." (Fig. 2).

A more detailed description of Canadian Hawk Owl breeding records (Fig. 3 and Table 1) was compiled from published accounts and personal communications. These are grouped by province and territory and presented below:



Fig. 2. Canadian breeding distribution of the Northern Hawk Owl. (Godfrey 1986)

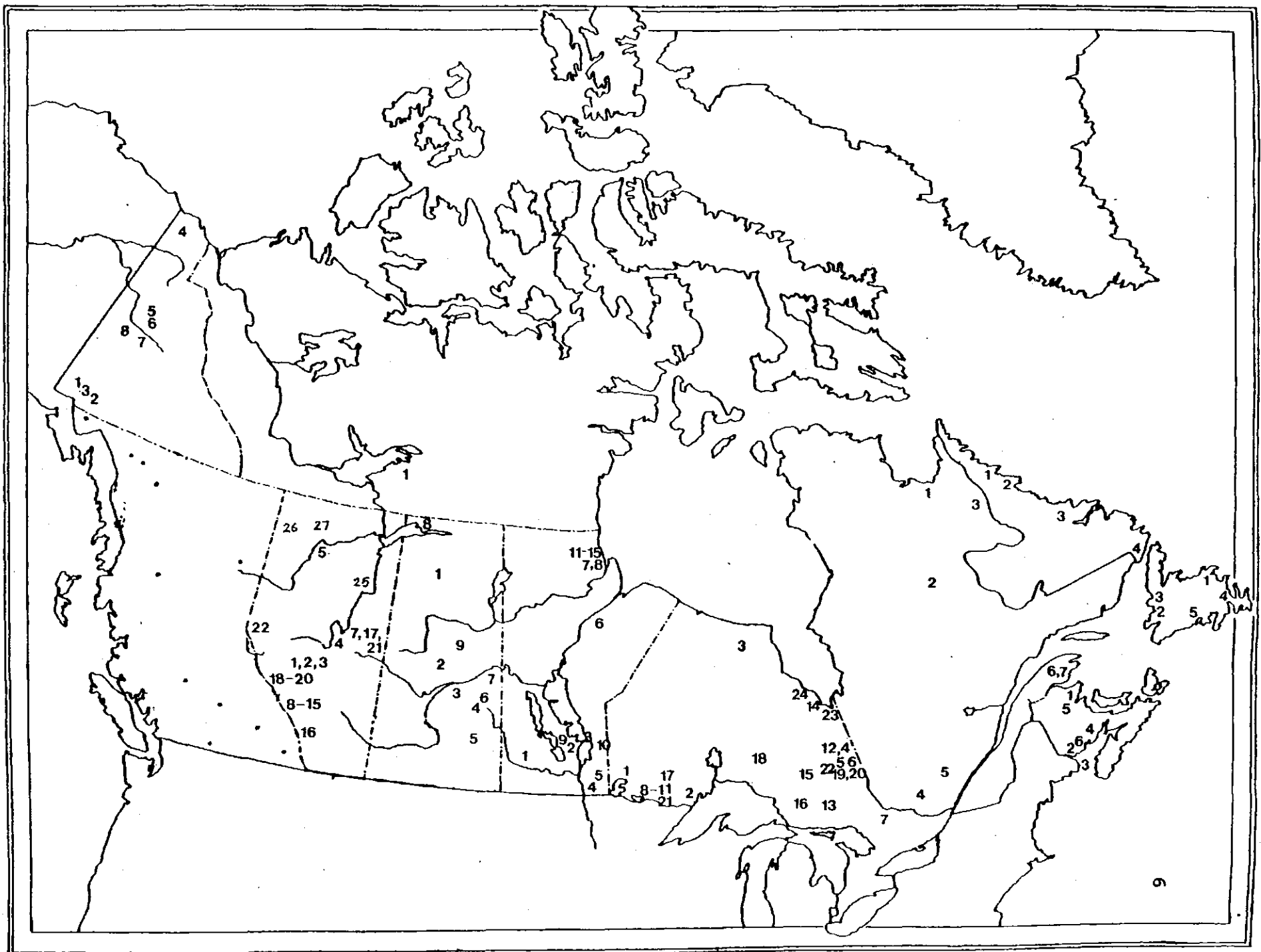


Fig. 3 Canadian Hawk Owl breeding records

Table 1. Canadian Hawk Owl breeding records (numbers correspond to numbers in Fig. 3).

Yukon

1. Kluane Lake, 6 nests 1988-1990 (C. Rohner, pers. comm.)
2. Jarvis River 1988 (C. Rohner, pers. comm.)
3. Dezadeash Lake 1990 (C. Rohner, pers. comm.)
4. Firth Valley 1974 (D. Mossop, pers. comm.)
5. Dempster 1980 (D. Mossop, pers. comm.)
6. Dempster 1981 (D. Mossop, pers. comm.)
7. Klondike Valley 1980 (D. Mossop, pers. comm.)
8. Klondike Road 1981 (D. Mossop, pers. comm.)
9. Pickhandle 1991 (D. Mossop, pers. comm.)

Northwest Territories

1. Gagnon Lake 1962 (Scotter and Erickson 1963)

British Columbia

- 16 breeding records (Campbell et al. 1988)

Alberta

- 1, 2 & 3: Belvedere (Henderson 1919)
4. Partridge Lake 1988 (C. Seburn, pers. comm.)
5. Wadlin Lake 1990 (C. Seburn, pers. comm.)
6. Suncor-Inc. Lease # 86 West 1987 (C. Seburn, pers. comm.)
7. MacKay 1975 (R. Gehlert, pers. comm.)
8. Banff National Park 1975 (Pinel et al. 1991)
9. Banff National Park 1976 (Pinel et al. 1991)
10. Banff National Park 1977 (Pinel et al. 1991)
11. Banff National Park 1978 (Pinel et al. 1991)
12. Banff National Park 1972 (Pinel et al. 1991)
13. Storm Mt. Lodge, Banff National Park (Pinel et al. 1991)
14. Lake Louise, Banff National Park (Pinel et al. 1991)
15. Crowfoot Glacier, Banff National Park (Pinel et al. 1991)
16. Water Valley (Calgary) 1980 (D. Collister, pers. comm.)
17. MacKay 1971 (Pinel et al. 1991)
18. Edson 1974 (Pinel et al. 1991)
19. Chip Lake 1977 (Pinel et al. 1991)
20. Mayerthorpe 1974 (Pinel et al. 1991)
21. MacKay 1975 (Pinel et al. 1991)
22. Little Kakwa River 1978 (Pinel et al. 1991)
23. Syncrude Lease 1975 (Pinel et al. 1991)
24. Syncrude Lease (second area) 1975 (Pinel et al. 1991)
- 25-27. The Atlas of Breeding Birds of Alberta (Semenchuk 1992)

Table 1 continued

Saskatchewan

1. Cree Lake 1964 (Davis 1966)
2. Weyakwin 1987 (Jensen 1988)
3. Waitville 1969 (Hunter 1969)
4. Somme 1920 (C.S. Houston, pers. comm.)
5. Ituna 1963 (Shulver 1965)
6. Hudson Bay Junction 1923 (Mitchell 1924)
7. Carrot River 1977 (C.S. Houston, pers. comm.)
8. Fond du Lac 1885 (Nero 1963)
9. Lac la Ronge 1978 (K. McKeever, pers. comm.)

Manitoba

1. Minnedosa 1891 (Raine 1892)
2. Riverton 1929 (Cartwright 1929)
3. Hecla Island 1977 (Taylor 1983)
4. Vassar 1980 (Gollop 1980)
5. Whitemouth Lake 1980 (Gollop 1980)
6. Gillam 1989 (Duncan and Duncan, unpubl. data)
7. Churchill 1989 (Seutin 1990)
8. Churchill 1989 (Seutin 1990)
9. Kalevala 1921 (Norman 1921)
10. Bissett 1988 (R. Nero, pers. comm.)
11. Churchill 1988 (P. Scott, pers. comm.)
12. Churchill 1988 (P. Scott, pers. comm.)
13. Churchill 1988 (P. Scott, pers. comm.)
14. Churchill 1988 (P. Scott, pers. comm.)
15. Churchill 1990 (Lang et al. 1991)

Ontario

1. Kenora (Peck and James 1983)
2. Thunder Bay 1972 (Peck and James 1983)
3. Kiruna Lake (Sutton Ridges) 1981 (Weir 1988)
4. Lake Abitibi 1925 (Todd 1963)
5. (Todd 1963)
6. (Todd 1963)
7. Mer Bleue 1963 (Smith 1970)
8. Cache Lake 1972 (S. Peruniak, pers. comm.)
9. Waurag River 1972 (S. Peruniak, pers. comm.)
10. Waurag River 1979 (S. Peruniak, pers. comm.)
11. Seahorse Lake 1981 (S. Peruniak, pers. comm.)
12. Lake Abitibi 1928 (Smith 1957)
13. Gogama 1981 (K. McKeever, pers. comm.)
14. Moosonee 1981 (K. McKeever, pers. comm.)
15. Kapuskasing 1981 (K. McKeever, pers. comm.)

Table 1 continued

16. Chapleau 1981 (K. McKeever, pers. comm.)
17. Ignace 1990 (K. McKeever, pers. comm.)
18. Longlac (Peck and James 1983)
19. Lake Abitibi (Peck and James 1983)
20. Lake Abitibi (Peck and James 1983)
21. Rainy River District (Peck and James 1983)
22. West of Lake Abitibi (Peck and James 1983)
23. Moose Factory area (Weir 1988)
24. North of Moosonee (Weir 1988)

Quebec

1. (Todd 1963)
2. (Todd 1963)
3. (Todd 1963)
4. Possible nest at Lochaber Bay (Smith 1922)
5. Lake Malin (Laurentides Wildlife Reserve) 1989
(M. Lepage, pers. comm.)
6. Gaspésian Park 1961 (Bagg and Emery 1961)
7. Eastern Gaspé 1949 (Ball 1954)

New Brunswick

1. Tabusintac 1925 (Harlow 1944)
2. Point Lepreau 1878 (Squires 1976)
3. Grand Manan (Squires 1976)
4. (B. Johnson, pers. comm.)
5. Miramichi River region 1986 (R. Walker, Maritimes Breeding
Bird Atlas, pers. comm.)
6. Point Wolfe River 1988 (R. Walker, Maritimes Breeding Bird
Atlas, pers. comm.)

Labrador

1. (Todd 1963)
2. (Todd 1963)
3. (Todd 1963)
4. (Todd 1963)

Newfoundland

1. NE of Stag Lake Provincial Park 1987 (J. Maunder, pers. comm.)
2. Grand Lake 1987 (J. Maunder, pers. comm.)
3. Nicholsville 1987 (J. Maunder, pers. comm.)
4. Big Gull Lake 1987 (J. Maunder, pers. comm.)
5. Bay d'Espoir Highway 1988 (The Bullbird 1988)

Yukon

Hawk Owls are fairly common in southwestern Yukon along the Alaska Highway between Whitehorse and the Boundary to Alaska, and occur up to the timberline at 1000 m above sea level along the Haines Road near the Chilkat Pass (Christoph Rohner, pers. comm.). A population of Hawk Owls between Kluane Lake and Haines Junction is presently studied within the scope of a boreal forest ecosystem project (Krebs et al. 1991). Eight nests or fledged families have been found from 1988-1990, and the minimum breeding density averaged 2-4 pairs on an area of 100 km² (Rohner et al., in prep.). Nesting pairs have also been found near Dawson City, Stewart Crossing and on the Dempster Highway. They have been observed regularly southeast of Teslin during winter, and in the MacPass area (Yukon/Northwest Territories border) in the fall (Norman Barichello, pers. comm.). Dave Mossop (pers. comm.) reported six nests between 1974 and 1991. He added that observations of adults vary from year to year, and they are "definitely not uncommon."

Northwest Territories

North of Great Slave Lake the species is considered rare but occasionally abundant. It is more common south and west of Great Slave Lake. It also occurs in the Mackenzie Valley where it is occasionally seen or accidentally trapped (Robert Bromley, pers. comm.). A nest was recorded at Gagnon Lake in 1962 (Scotter and Erickson 1963).

British Columbia

In British Columbia, the Hawk Owl has been sighted in summer on a few occasions in the extreme north at the Yukon-British Columbia boundary (Guiguet 1960). In this province it appears to be uncommon, even in winter, with only a few widely spaced records. Brooks and Swarth (1925) thought that the Hawk Owl probably had a wide distribution throughout the province, "though reported but from a few points." Campbell et al. (1990) reported the Hawk Owl as an uncommon resident in the northern interior; probably local and rare at higher elevations in the southern interior; irregular transient and very rare winter visitor in the south; casual on the northern mainland coast; and very rare on the southwest coast including southern Vancouver Island. There are 16 breeding records for the province, three representing actual nests and the others of flightless young.

Alberta

In Alberta, Henderson (1919) stated that Hawk Owls nested quite commonly near Belvedere. In 1919, he documented three nests within 6-8 km of each other. Frank L. Farley, Camrose, Alberta (In Bent 1938) reported: "The hawk owl has become exceedingly rare during the past 25 years. The winter of 1896-97 witnessed a real invasion of these owls into central Alberta, when in one days drive I counted as many as 30 of the birds as they hunted over the prairie, or perched on the tops of trees and haystacks watching for mice." Semenchuk (1992)

reported the Hawk Owl to be uncommon and widely dispersed in suitable habitat. According to Doug Collister (pers. comm.), the Hawk Owl seems to be irregularly cyclical, and northwest of Calgary the species can be rare or non-occurring for 10 years and then occur in good numbers. Three breeding records were documented in the Alberta Breeding Bird Atlas (Carolyn Seburn, pers. comm.); one in 1988 at Partridge Lake, northeast of Barrhead; Wadlin Lake in 1990; and Suncor Inc. Lease # 86 West in 1987. Robert Gehlert (pers. comm.) found a nest north of MacKay in 1975. He has banded Hawk Owls for the last 20 years 130-160 km west of Edmonton in the Nojack-Niton-Peers area. He noted a decrease in numbers of Hawk Owls in his study area over the last 10 years. Pinel et al. (1991) reported 17 nests for Alberta from 1971-1978, and Doug Collister (pers. comm.) documented a nest near Calgary in 1980. Semenchuk (1992) reported 36 breeding records for Alberta from 1987-1991, 8 of which are confirmed, 4 probable, and 24 possible.

Saskatchewan

Paul James (pers. comm.) felt that the Hawk Owl is much rarer than the Great Gray Owl (Strix nebulosa). Hooper (1992) reported the Hawk Owl as an irregular permanent resident in the east-central region of Saskatchewan. They are found in forests and bluffs from Somme to Hudson Bay and northward, travelling south in winter to Reserve and Norquay. Alan Smith (pers. comm.) reported three confirmed breeding records for the province, two

probable breeding records, and nine possible breeding records. He also reported two individuals as spring transients and 50 as winter residents. C. Stuart Houston (pers. comm.) reported two nests for the province; one at Somme in 1920 and another at Carrot River in 1977. Other nests were located at Cree Lake in 1964 (Davis 1966), Waitville in 1969 (Hunter 1969), Ituna in 1963 (Shulver 1965), Hudson Bay Junction in 1923 (Mitchell 1924), Fond du Lac in 1885 (Nero 1963), and Lac la Ronge in 1978 (Kay McKeever, pers. comm.).

Manitoba

The southernmost breeding records for the Hawk Owl are Vassar and Whitemouth Lake (Gollop 1980). The northernmost records were at Churchill (Seutin 1990, Lang *et al.* 1991, Peter Scott, pers. comm.); another northern nest was recorded near Gillam in 1989 (Duncan and Duncan, unpubl. data). Chartier (1988) reported the Hawk Owl as being "extremely rare" in the Churchill area. Gillespie and Kendeigh (1982) found Hawk Owls present at Herriot Creek, 26 km southwest of Churchill. Fisher (1893) found the Hawk Owl to be quite common in some winters in Manitoba. Norman (1921) found the Hawk Owl to be by far the most common owl, at least in northern Manitoba. Nests have been found at Minnedosa (Raine 1892), Kalevala (Norman 1921), Riverton (Cartwright 1929) and Hecla Island (Taylor 1983). A juvenile Hawk Owl was found near Bissett in June 1988, representing another nest record for the province (Robert Nero, pers. comm.).

Ontario

McIlwraith (1894) regarded the Hawk Owl as a rare winter visitor in southern Ontario, being more common in the north. Smith's (1970) record of nesting Hawk Owls at the Mer Bleue near Ottawa in 1963 was the first definite breeding record for the Ottawa area and for southern Ontario. Previous breeding records for Ontario were all from more northern areas (Smith 1970). Weir reported four confirmed, three possible, and three probable breeding records, and Peck and James (1983) reported an additional seven nest records for the province. Todd (1963) stated that the first nest found was at Lake Abitibi in 1925, with two other nests close by (no years given). Shirley Peruniak (pers. comm.) reported four nests for the Quetico Provincial Park area, and Smith (1957) reported a nest at Lake Abitibi in 1928. Kay McKeever (pers. comm.) provided six breeding records as a result of receiving juvenile birds from these areas to the Owl Rehabilitation Research Foundation. The species is nowhere a common bird, even in the core of its Ontario range (Weir 1988).

Quebec

Smith (1922) documented a possible breeding record for Hawk Owls at Lochaber Bay, Papineau County, approximately 25 km northeast of the Mer Bleue nest-site. He observed and collected a pair of Hawk Owls he believed to be breeding (no nest was found). Todd (1963) reported three other nests, but did not give details. Fisher (1893) found the Hawk Owl to be quite common in

some winters in the vicinity of Quebec city and Montreal. There was a possible nest in 1973 at Lake Rimouski in the Rimouski Park, and in 1989 an adult was observed with three young at Lake Malin in the Laurentides Wildlife Reserve (Michel Lepage, pers. comm.). Nests were also documented in Gaspésian Park in 1961 (Bagg and Emery 1961) and in Eastern Gaspé in 1949 (Ball 1954); no details were given.

In the Quebec City region, Hawk Owls are much less abundant than other owl species, and like the Snowy Owl in that they visit the area in the winter (Fortin et al. 1983). In the Quebec Méridional region, it was reported that Hawk Owls are rare nesting residents, and that they nest in all regions except Ungava (David 1981). For the Gaspé region, Bisson and Poulin (1982) described the Hawk Owl as a resident nester. Gendron and Gauthier (1984) reported that for the Saint-Laurent region, the Hawk Owl is a rare visitor, and that it is a possible nester but its status is unknown.

New Brunswick

Squires (1976) reported the Hawk Owl as a rare transient and winter resident, and a very rare summer resident. Most reports were from December and January. There was a nest documented at Tabusintac in 1925 (Harlow 1944), and a juvenile was taken at Point Lepreau in 1878. In 1963, two adults with three young were seen at Grand Manan (Squires 1976). Over the last 14 years, Harry Walker (pers. comm.) has had only three

records of the Hawk Owl; in 1983, 1986 and 1989. In 1986, a pair on territory was observed near the Miramichi River region, and in 1988 a family group of five young Hawk Owls was located on a ridge east of Dustin Brook, about 1 km north of the Point Wolfe River (Rob Walker, Maritimes Breeding Bird Atlas, pers. comm.) In 1905, however, Baird, Brewer and Ridgway (In Bent 1938) reported that a Mr. Dresser had observed the Hawk Owl in New Brunswick, "where he found it by no means uncommon."

Nova Scotia

McLaren (1985) thought the Hawk Owl was more common in early times (late 1800's), and it may have resided in the province year-round. In 1865, Downs (In McLaren 1985) said that it was "in some years very abundant in winter." In 1913, 15 were recorded around Halifax, representing the only notable invasion there in the present century (Tufts 1986). Tufts (1986) suggested that the Hawk Owl did not fare well after this due to increased human settlement. Fisher (1893) found the Hawk Owl to be quite common in some winters. Since 1960, there have only been nine sightings in the province, and there have been no reliable records of the species since 1982 (Ian McLaren, pers. comm.). According to Ian McLaren (pers. comm.), they are rare and have not appeared in Nova Scotia during recent periodic winter invasions.

Newfoundland and Labrador

Austin (1932) reported the Hawk Owl as a common permanent resident in the wooded portions of Newfoundland and Labrador. In 1926, trappers would see them almost daily during the winter along their traplines in the interior (Austin 1932). Mac Pitcher (pers. comm.) considers the Hawk Owl to be the rarest of the indigenous owls in Newfoundland, being more common in the west and a rarity in the east. Todd (1963) listed it as rare along the south coast of Newfoundland, and more common to the north with Okak apparently the northern limit. Wildlife staff in Labrador (as reported to Mac Pitcher) consider the Hawk Owl to be widespread and fairly common. In 1987, four family groups of Hawk Owls were discovered in Newfoundland in the Stephenville, Corner Brook and Deer Lake areas. All sightings were located in old cutover areas with young regrowth and old standing dead trees, with black spruce bogs nearby. This habitat type is vast in Newfoundland. It is believed that there has always been Hawk Owls in this area, but they went unnoticed as the area was poorly covered (The Bullbird 1987). In 1988, one adult and fledging Hawk Owl were seen in a burn on the Bay d'Espoir highway, 47.5 km south of the Trans Canada Highway (The Bullbird 1988).

3. U.S. Breeding

Although the breeding range of the Hawk Owl lies mainly north of the United States, there are some breeding records from the northeastern states into which the boreal forest extends.

Johnsgard (1988) stated that the Hawk Owl breeds in northern Minnesota, northern Michigan and rarely northern Wisconsin.

Barrows (1912) reported that a young Hawk Owl was taken from Isle Royale on 4 August 1905, and that an adult was seen nearby.

Roberts (1932) reported a nest at Delavan, Wisconsin, and Bernard and Klugow (1963) reported two nests in Douglas County, three km apart from each other.

In Minnesota, Green and Janssen (1975) reported: " After major invasions [of Hawk Owls] a few birds remain during the summer, and breeding has been reported in Norman County (1885) and Roseau County (1906 or 1907)." More recently, four nests have been documented: St. Louis County (Strnad 1963), Lake of the Woods County (Kehoe 1982), Aitkin County (Loch 1981) and Roseau County (Lane and Duncan 1987).

In Alaska, Armstrong (1980) reported the Hawk Owl as common in the southeast, uncommon to common (in winter) along the south coast, rare to uncommon (in winter) in the southwest, common centrally and uncommon in the west. It was not known to occur in the north, and breeding was not known to occur in the southeast or north. Kertell (1986) documented two nests in Denali National Park.

C. PROTECTION

In Canada, all raptors are protected by legislation drawn up by the individual provinces and territories between 1957 and 1967 (Hilton 1977). In the United States and Mexico, raptors

are protected by an agreement signed by the two countries on 10 March 1972 (Olendorff et al. 1980).

Unfortunately, protection can be difficult to enforce and raptors, including Hawk Owls, are still shot. Owls are also accidentally trapped on traplines. Such mortality is difficult to monitor as most of these events go unreported.

D. POPULATION SIZE AND TREND

Although the information available on population numbers over the last hundred years is largely anecdotal and sparse, it seems to imply that Hawk Owls have declined over many areas in which they were formerly abundant. Table 2 summarizes this information and Figure 4 shows recent information on the abundance of the Hawk Owl across Canada. Virtually nothing is known about current population size and recent trends. Large annual fluctuations make population trends almost impossible to quantify. Erskine (1977) stated that presumably Hawk Owls, as well as the Great Gray Owl (Strix nebulosa) and Boreal Owl (Aegolius funereus), have never existed at other than very low densities, and their low densities reflect their status as widely dispersed resident predators. Because of low densities, adequate raptor population data is hard to obtain (Newton 1976).

Table 2. Long-term population change estimates for the Northern Hawk Owl in Canada.

Location	Past	Recent
British Columbia	-seems to have declined in recent years -large numbers seen in late 1800's and 1900's have not been seen in recent years	-uncommon resident to rare
Alberta	-formerly quite common, its numbers have been considerably reduced -have become exceedingly rare during the past 25 years	-scarce resident, regular but thinly dispersed
Alaska	-most abundant bird of prey	-declines in numbers and reproduction
Sask.	-most common owl of the interior (resident all winter along the Sask.R.)	-very rare permanent resident in the north, very rare in the south
Manitoba	-most common owl in northern MB	-extremely rare in Churchill, rare south
Quebec	-common in some winters	
New Brunswick	-by no means uncommon	-rare transient & winter resident, very rare summer resident
Nova Scotia	-more common in late 1880's, very abundant in some years in winter	-rare; does not appear to travel here during recent winter invasions
Newfoundland & Labrador	-common permanent resident	-rarest of indigenous owls, widespread & common in Labrador

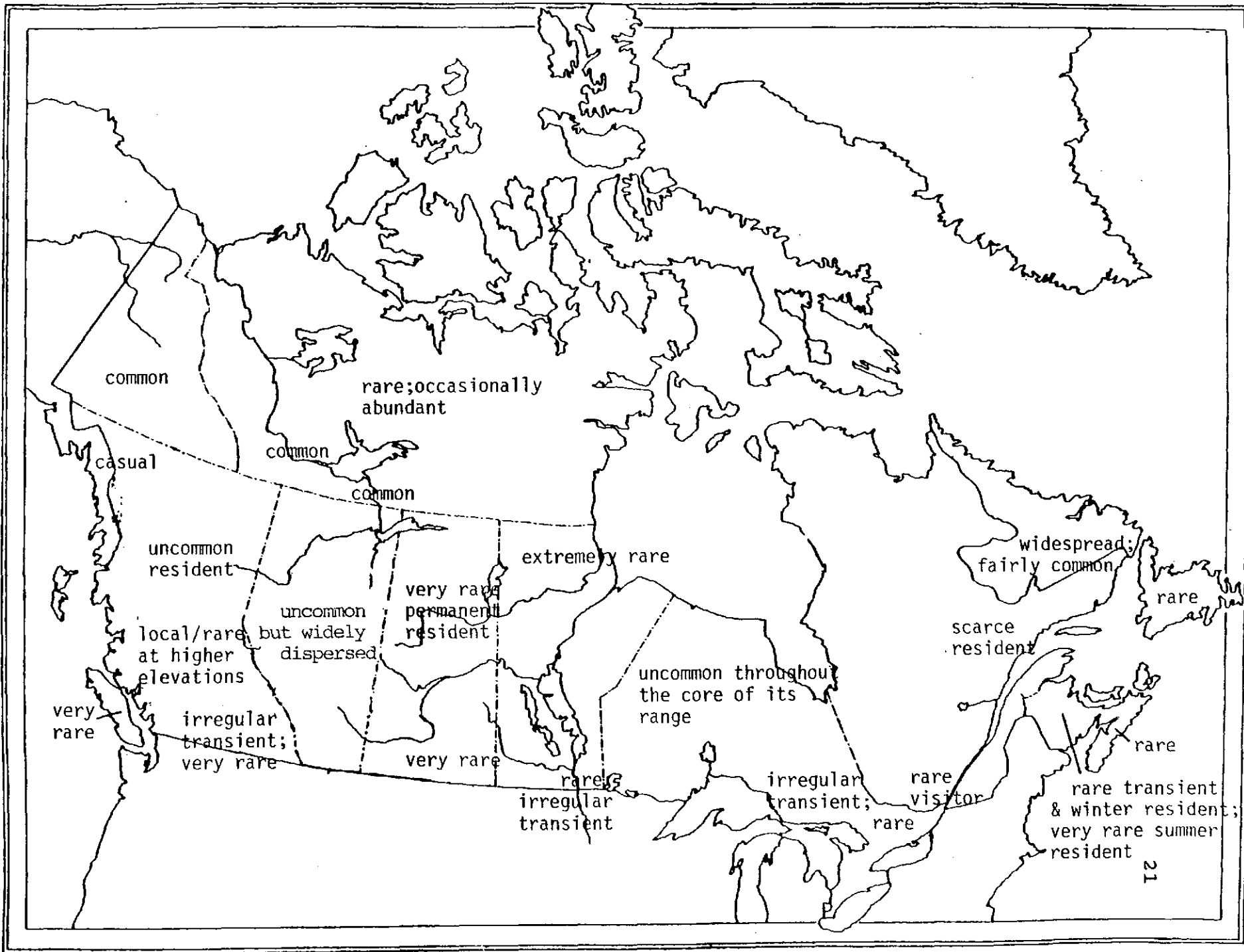


Fig. 4 Hawk Owl abundance across Canada based on most recent literature.

In British Columbia, Guiguet (1960) stated that the Hawk Owl seems to have declined in recent years. The large numbers recorded in invasion years in the late 1800's and early 1900's have not been seen in recent years. In Alberta, where Hawk Owls were formerly quite common, its numbers have been considerably reduced (Salt and Wilk 1966). Nelson (In McIlwraith 1894) and Ingersoll (1914) described the Hawk Owl in Alaska as being the most abundant resident bird of prey throughout the entire wooded region in the north. Here it is limited to spruce and pine forests of the interior, occurring along the open coasts of the Arctic and Bering seas as a straggler (Ingersoll 1914). Researchers have noted declines in Hawk Owl numbers and reproductive success in interior Alaska (Dixon 1938, Murie 1963). Walker (1974) described the Hawk Owl as becoming rare over most of its former haunts. The general opinion seems to be that populations have declined over the years.

Accounts of Hawk Owl population sizes and trends are anecdotal. "It is difficult if not impossible to assess the population status or trends of this species, as their breeding ranges are so far removed from most human population centres, and it would be almost impossible to census visually on the breeding areas anyway." (Johnsgard 1988). However, Fyfe (1976) reported what he believed to be a reasonably accurate picture of the status of most birds of prey populations in Canada (while recognizing the inadequacies of such a general survey). For the Hawk Owl, he stated that in the Maritimes, the population trend

is unknown, and relative abundance rare. For Ontario and southern Quebec, the trend was fluctuating, with relative abundance rare-low. The Prairie Provinces and British Columbia were also reported as fluctuating, with low-medium relative abundance.

Irruptions

In October and November 1884, hundreds of specimens were taken in northern New England (Barrows 1912). In Manitoba, Hawk Owls were very abundant in the fall/winter of 1884-85, with over 50 records (Thompson 1891). Fryklund (In Roberts 1932) reported "Hawk Owls more numerous than for 20 years" near Roseau, Minnesota in the fall/winter of 1926-27. In southern Ontario, there were over 100 reports from the 1962-63 invasion (Speirs 1985). The 1962-63 invasion of northern Minnesota also produced over 60 reports (Green 1963). Maine, New York and Wisconsin also noted unusually large numbers of Hawk Owls during the fall and winter of 1962-63, with a new high for Wisconsin (Bernard and Klugow 1963).

In Europe, the Hawk Owl has declined markedly in the past century, with more recent periodic invasions southward being fairly small scale as compared with earlier ones (Mikkola 1972). The Scandinavian population has diminished in numbers and is currently retreating northwards. In some areas of Europe (Livonia, Pomerania, Poland), it no longer occurs regularly (Voous 1988). "Irruption flights are known to have occurred in

both the Old and the New World, but these have been more extensive in North America than in Eurasia and more conspicuous in the nineteenth than in the twentieth century." (Voous 1988).

While Hawk Owl numbers fluctuate locally, the current overall Canadian population likely remains constant from year to year. In a given area, where there is suitable habitat and an adequate prey population, breeding may occur and local numbers of Hawk Owls may increase. "As a primarily myophagus, taiga-inhabiting species it shows impressive population fluctuations and erratic movements which can assume the character of irruptions." (Voous 1988). Johnsgard (1988) added, "...there are periodic changes in breeding densities and distributions, as local or regional rodent populations rise and crash, often at intervals of about 3-5 years." Given that voles, the principal prey of breeding Hawk Owls, are cyclical (Krebs and Myers 1974), a given area may not be suitable for nesting in subsequent years. The information available states that Hawk Owls emigrate (during fall/winter) from areas with food shortages into areas of higher prey abundance in order to survive and reproduce (Austin 1932, Hagen 1956, Guiguet 1960).

E. HABITAT

Throughout the Canadian boreal forest there are three major habitat types: 1. Forest and Barren 2. Predominantly Forest 3. Forest and Grassland (Fig. 5) (Rowe 1972). The more northern forest and barren region may be where the majority of

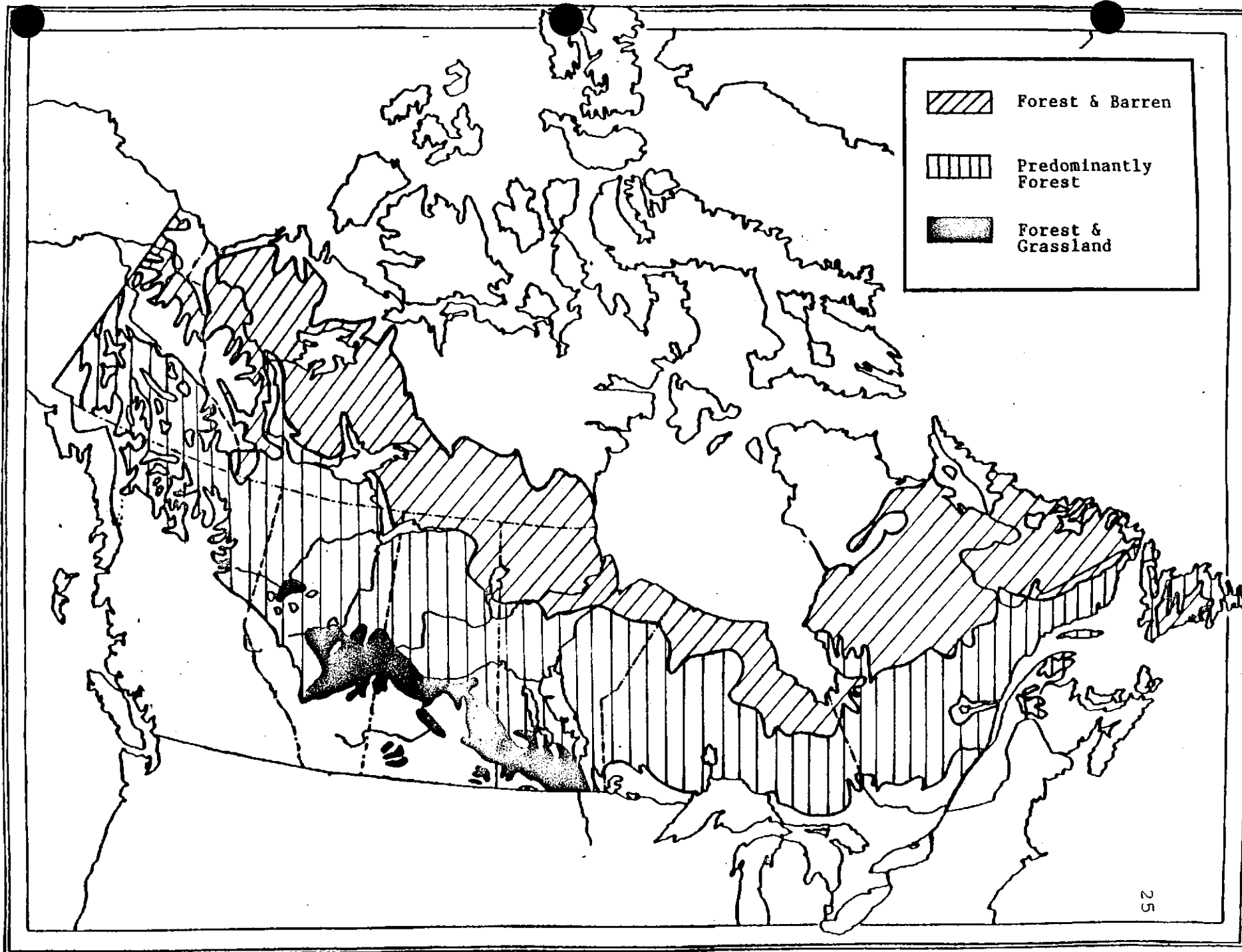


Fig. 5 The three major habitat types of the Boreal forest (From Rowe 1972)

the population occurs, with the other two more southern areas being important for its southward irruptions and occasional breeding. Rowe (1972) described the forest and barren region as having three main zones; the northwestern transition zone, the northeastern transition, and the Hudson Bay Lowlands. The northernmost edge of the northwestern transition zone consists of a pattern of tundra "barrens" and patches of stunted forest. The primary species include black and white spruce accompanied by alder and willow shrubs. Subject to frequent fires, climate extremes and thin soils, tree species in the area have reduced distribution, abundance and size. Bog, muskeg and barren rock mix with open stands of dwarfed trees, with better drained and sheltered areas having larger growth. Black spruce is dominant in all sites, accompanied with white birch and tamarack; the latter more abundant further north. In the east, the northeastern transition is a patchwork of lakes, rivers, bogs, swamps and muskeg with areas of upland barrens and forest. Closed forest stands are less common. In low areas, muskeg and bog stretches for miles. The Hudson Bay Lowlands are characterized by flat topography and poor drainage. Generally, it has a "subarctic" appearance due to the prominence of an open woodland of black spruce and tamarack in the muskegs and patterned fens (Rowe 1972). In general, this entire northern area fronting the tundra is characterized by open stunted forests interspersed with bogs and muskeg and areas where conditions allow for some species to attain good growth and height. This

habitat is ideal for Hawk Owls. Because Hawk Owls are predominantly visual predators, it therefore depends on forests where the trees are widely spaced. This may be a reason for its northern distribution and for its choice of regions at high elevations above sea level. Forests here are open and the coniferous trees are usually widely spaced and have typically narrow crowns, allowing good view of the forest floor (Norberg 1987). This northern transition zone may contain the majority of the population due to its structural characteristics. These northern areas are subject to naturally occurring burns which are usually left unchecked if far from human settlements. These burns may benefit Hawk Owls in that they are known to hunt in old burns (Voous 1988, Mikkola 1983). Burns occasionally benefit small mammals (principle prey of the Hawk Owl) or cause only temporary declines in their populations. Small mammals seem to survive forest fires well, under deep sphagnum moss cover, and populations recover quickly (Kelsall et al. 1977). Forestry practices are not a threat to these northern areas because the timber for the most part is non-commercial and not economical. In addition, the low wet landscape makes it virtually impossible to access these areas. Pruitt (1978) added, although extensive in North America, this area is not very important economically and consequently has been little studied.

When small mammal populations crash, Hawk Owls are forced to leave areas in the north and wander south in search of prey. In Europe, Mikkola (1983) stated that when vole

populations are normal, most Hawk Owls winter in the north, but after peak vole years remarkable southward invasions of owls may occur. It is known that Hawk Owls prey on a wider variety of species in the winter but the extent of this is unknown. When they do so, it is the more southern areas of the boreal forest they depend on for survival at this point. Rowe (1972) described the Predominantly Forest Section (Fig. 5) as having several more distinct habitat types, the major of these including the mixedwood and northern coniferous in the west, and the central plateau, northern clay, and Chibougamau-Natashquan in the east. The mixedwood area varies in proportion of trembling aspen and balsam poplar, white and Alaska birches, white spruce and balsam fir. Trembling aspen has the greatest areal coverage. Higher sandier areas consist of jack pine mixed with black spruce, with lower positions developing black spruce and tamarack muskeg. The northern coniferous section has reasonable tree growth, with closed forests in areas where soil depth is adequate. Black spruce is predominant, forming stands on the uplands where the soils are thin as well as in the poorly drained lowlands. It may be associated with jack pine and tamarack in these two positions. The clay belt is strongly characterized by "seemingly endless stretches of stands of black spruce which cover the gently rising uplands as well as the lowland flats, alternating in the latter position with extensive sedge fens and sphagnum-heath bogs." (Rowe 1972). Spruce-cedar swamps are extensive. In the central plateau, jack pine is prevalent in areas of extensive sand and

gravel deposits. Black spruce is developed in shallow swamps. Bog, muskeg and upland rock barren occur throughout. The Chibougamau-Natashquan area is a productive forest belt with black spruce dominating. The prominence of black spruce on peaty lowland sites and well-drained upland drift and rock, combined with the scarcity of white spruce and balsam fir, make for a limited variety of cover types (Rowe 1972). Overall, the Predominantly Forest Section consists of well developed, relatively closed forests, interspersed with wet swampy areas. Hawk Owls will occur throughout these areas during the year, and will breed even in the most southern areas if conditions are favourable. Forestry practices are considerable in these areas and burns are usually controlled when they occur in populated areas or areas of merchantable timber.

The southernmost edge of the boreal forest is designated as Forest and Grassland. In this area, trembling aspen is abundant with balsam poplar frequently present on moist lowlands (Rowe 1972). Although this habitat is not preferred by Hawk Owls, they irregularly wander into these areas during winter months in search of prey.

To have a clearer understanding of just how important each habitat type is to the Hawk Owl population, more information is needed on their movements, lifetime habitat requirements, and on principle prey species. However, based on habitat preferences and distribution, it is likely that the more northern forests (forest and barren regions) support the majority of the

population. Occasionally owls will stop and breed in more southern areas, and it has been suggested that these are younger, less experienced birds that have no site-fidelity to the north as yet (Kay McKeever, pers. comm.). Furthermore, the larger part of an invading population is thought to return to northern areas to breed (Kay McKeever and Robert Nero, pers. comm.).

Typical Breeding Habitat

Johnsgard (1988) described the typical breeding habitat of the Hawk Owl as open to moderately dense coniferous or mixed coniferous-deciduous forests bordering marshes or other open areas, such as those cleared by logging. Breeding habitat extends north to the tree line, including the taiga/tundra ecotone. In mountainous areas, it extends upward to timberline, sometimes as high as 2000 m elevation (Johnsgard 1988). Open hunting areas with suitable perches are favoured. These may be in the form of muskegs, dry ridges, stunted krummholz trees at the timberline, burned areas, clearings and swampy valleys or meadows. Areas with stumps, snags, or dead trees with bare branches serving as hunting perches are particularly favoured (Mikkola 1983, Cramp 1985, Voous 1988). Hawk Owls frequently perch on the topmost branch of trees or at the top of snags (Johnsgard 1988, pers. obs.). The dark, impenetrable spruce-fir forest is not preferred (Voous 1988).

Outside the breeding season, Hawk Owls are found in a wider variety of habitats. These include wooded farmlands and

sometimes prairie areas where they may perch on haystacks, posts, or any trees or bushes that may be available (Johnsgard 1988). During winter, they have been observed hunting in old burns and perched in large elms along rivers surrounded by agricultural land (Lane and Duncan 1987).

Essential Habitat

Given that open areas with suitable hunting perches are clearly preferred (Smith 1970, Jones 1987, Mikkola 1983), these areas are likely essential for Hawk Owls, especially during the breeding season. Hawk Owls hunt from high vantage points and swoop down on prey fast and low (Mikkola 1983). In addition, suitable nest-sites in the form of stumps or snags with natural cavities are essential for breeding.

Modified logging practices have the potential to enhance Hawk Owl habitat (Sonerud 1986). Smaller, well spaced clear-cuts may attract Hawk Owls to an area, as they prefer smaller open areas. If these areas have enough stumps and trees for hunting perches and nesting, they will offer year-round habitat. Hawk Owls were observed hunting in cutover areas throughout the year in southeastern Manitoba and adjacent northern Minnesota in years of high prey availability (pers. obs.). These areas were small cuts (5-10 hectares), with many suitable perches distributed throughout, from 3 to 10 years old. Gary Bortolotti (pers. comm.) has twice observed Hawk Owls using cuts 8-10 years old in north-central Saskatchewan. In Manitoba, Hawk Owls also hunt in

burned areas that are several years old (pers. obs.). In the Yukon, Christoph Rohner and Norman Barichello (pers. comm.) have observed Hawk Owls hunting in open spruce forest, burns, cutovers, marshland with shrubs, and at or near the treeline.

F. GENERAL BIOLOGY

Reproductive Biology

Although there is some information on Hawk Owl breeding behaviour (Henderson 1919, Bernard and Klugow 1963, Smith 1970, Lane and Duncan 1987), most of it is not detailed or thorough. Kertell's (1986) research in Alaska is perhaps the most detailed account of Hawk Owl nesting behaviour in North America. In contrast, much work has been done in Europe (Mikkola 1983, Huhtala et al. 1987, Leinonen 1978, Pulliainen 1978).

The breeding age of the Hawk Owl is unknown, but it likely breeds in its first year (Hagen 1956, Johnsgard 1988). It does not breed every year; breeding depends on food supply and there may be no breeding at all in years of prey scarcity (Hagen 1956). Lapland researchers reported that Hawk Owls only nest twice every four years in accordance with fluctuating vole and lemming populations (Semenov-Taishanski and Giljasov 1985). Although polygyny has not been documented for the Hawk Owl in North America, Sonerud et al. (1987) reported a polygynous male in southeast Norway. The secondary nest was unsuccessful.

Clutch size also depends on the availability of prey, and varies with the fluctuating prey base (Mikkola 1983,

Johnsgard 1988). Clutch size ranges from 3 to 13 eggs (Voous 1988). Survival to independence is unknown. Virtually no quantitative information is available on nest success or reasons for nest failure in Hawk Owls (Voous 1988).

The location of the nest-site close to open ground reflects the Hawk Owl's hunting methods (Mikkola 1972). Nest-sites are located in cavities in decayed trees, open decayed hollows where tree tops have broken off, and in vacant nests of woodpeckers, especially those with a clear view through the open forest (Lane and Duncan 1987, Duncan and Duncan unpubl. data). Bent (1938) also reported the rare use of stick-nests and cliffs. Wherever there is a suitable nest-site within or near an area of open ground, and if prey availability is adequate, successful breeding may occur. Based on radio-telemetry data from Norway, Hawk Owl home range size varied from 140-848 ha (Bjorn et al. 1987).

Information is not available on the reproductive rate or mortality of Hawk Owl populations. It appears to be somewhat r-selective and likely capable of reproducing rapidly when conditions are suitable (Hagen 1956). R-selective species are those that mature early, have larger broods and a shorter life-span. They characterize populations that live in fluctuating environments and are subject to frequent episodes of colonization (Andrewartha and Birch 1984). These may well be adaptations to an unpredictable environment in which the Hawk Owl has evolved. A high reproductive potential could theoretically mean that

populations are somewhat buffered against higher mortality by persecution. However, high clutches have only been found regularly in Europe, and nothing is known about age-specific mortality (Christoph Rohner, pers. comm.).

Movements

Like other boreal forest owls, the Hawk Owl is irruptive, probably dispersing in response to local changes in the availability of prey (small rodents). This accounts for periodic changes in breeding density and distribution as local small mammal populations rise and crash at 3-5 year intervals. Hawk Owls are thought to winter and summer in the north when prey populations are high, but following a crash, many birds disperse south (Godfrey 1986, Cramp 1985, Mikkola 1983). According to Voous (1988), irruptive flights have been more extensive in North America than Eurasia. They have also been more conspicuous in the 19th than in the 20th century. Irruptions have been documented in North America and Europe in different years and locations (Thompson 1891, Barrows 1912, Roberts 1932, Bent 1938, Hagen 1956, Bernard and Klugow 1963, Green 1963, Mikkola 1983, Speirs 1985, Lane and Duncan 1987, Johnsgard 1988). Movements of Hawk Owls are still unstudied in North America. Some information is known regarding the Eurasian population (Johnsgard 1988, Hagen 1956, Mikkola 1983).

Behaviour/Adaptability

During the non-breeding season, the Hawk Owl tolerates humans, and Walker (1974) has even called it tame. It is easily approached at this time. During southward irruptions they appear in cultivated areas and farmsteads. Fearless of humans, they will take mice from hay put out for cattle adjacent to human occupied dwellings (Voous 1988). In contrast, during the breeding season they can be very intolerant and aggressive, defending their nests and attacking potential threats (Bent 1938, Lane and Duncan 1987).

Food Habits

North American data on Hawk Owl food habits are scarce. Bent (1938) reported that mice, lemmings and ground squirrels are eaten in summer. In winter, there is a shift to readily available birds such as ptarmigan and grouse (Bent 1938, Fisher 1893, Kiliaan 1989), although the importance and extent is unknown. Lane and Duncan (1987) found meadow voles to make up most of the diet during the breeding and non-breeding season in northern Minnesota. This data is consistent with Hawk Owl diets in Minnesota (Johnson 1981, Savaloja 1980), and for the species in general (Bent 1938). During the breeding season in Alaska, Kertell (1986) recorded at least eight species of mammals, including shrews and hares; and four species of birds, including willow ptarmigan and gray jays. In the Yukon, the snowshoe hare was discovered to be a major food item in the diet of the Hawk

Owl during the breeding season (Christoph Rohner, pers. comm.).

The Hawk Owl seems to adapt readily to human induced change, as long as the changes are not extreme. In Europe, it has been recorded breeding twice within 100 m of human habitation (Mikkola 1972). In Manitoba and Minnesota, two nests in 1987 and 1989 were both beside roads, one of which was a busy highway (Lane and Duncan 1987, Duncan and Duncan, unpubl. data).

Nothing is known concerning the Hawk Owl's susceptibility to fluctuating water levels. These probably affect Hawk Owl numbers in that small mammal populations tend to fare better under moist conditions (Pruitt 1978). Clear-cutting tends to desiccate areas until sufficient ground cover is reestablished; this may in turn affect small mammal populations.

Hawk Owls have bred successfully in captivity at the Owl Rehabilitation Research Foundation, Vineland Station, Ontario (Kay McKeever, pers. comm.). Injured, unreleasable birds have raised young successfully, which were later released in the wild. Thus the potential exists should the need arise to assist population recovery through captive breeding.

G. LIMITING FACTORS

Human contact with northern species is usually minimal, but during the Hawk Owl's southern invasions this bold owl is conspicuous and hence vulnerable to human induced mortality. Its preference for open areas adjacent to wood likely increases human/owl encounters in southern areas. The Hawk Owl is an easy

target for collectors and those who illegally shoot raptors. Houston and Street (1959) pointed out that the Hawk Owl "...is more frequently killed than any other by the hunters, which may be partly attributed to its boldness and its habit of flying about by day." Kay McKeever (pers. comm.) believes that the tragedy of this bird is its lack of fear of humans and its diurnal habits, making it extremely vulnerable to shooting.

Historically, some native groups have killed owls for consumption. This practice presently continues and may have a greater impact on owl populations due to the use of rifles. Unfortunately, numbers of owls killed cannot be quantified as most of these events go unreported, so the degree of this mortality is unknown. At the Owl Rehabilitation Research Foundation in Ontario, Kay McKeever (pers. comm.) believes that each Hawk Owl received at the centre as a result of shooting probably represents dozens in the wild that are shot but unreported. It is believed that this is a significant cause of mortality in Ontario and more specifically in the villages of Attawapiskat and Moosonee on the east shore of James Bay. Of 23 Hawk Owls Kay McKeever (pers. comm.) has received from 1976 to 1991, eight were shot, four were juveniles that survived the destruction of their nests, three were hit by vehicle or train, one was accidentally trapped, and the remainder had collisions or no recorded history. Five of these owls were rehabilitated and released back into the wild.

Mortality may be more prevalent in some areas than others, and certain species, such as the Snowy Owl, may be taken in greater numbers due to its larger size. In some cases, smaller owls may not be shot simply because they are too small to eat (Ulrich Waterman, pers. comm.). Ted Wilson (pers. comm.) reported the situation is similar at Island Lake, Manitoba, where owls are frequently shot whenever they are encountered. In contrast, shooting of owls in the Yukon virtually never happens. Natives there have a high regard for owls, and the Hawk Owl and Boreal Owl are important birds in the culture of the people to the point that they will even carry on conversations with them (Dave Mossop, pers. comm.).

Accidental trapping of owls along trap-lines is another limiting factor for owls (Siddle 1984). In the Yukon, Hawk Owls are commonly reported as victims of fur trapping (Norman Barichello, pers. comm.). Also in the Yukon, Dave Mossop (pers. comm.) added that about six a year are accidentally trapped, and that this is a higher mortality factor than shooting. As with shooting, the extent to which this occurs across Canada is unknown.

The Great Horned Owl (Bubo virginianus) and Northern Goshawk (Accipiter gentilis) can be considered serious potential predators. There is an observation of a Hawk Owl hiding in a dense spruce stand immediately after a Goshawk had entered its range (Voous 1988). In Europe, the Hawk Owl has been recorded as prey by both owls and other raptors, including the Eagle Owl.

(Bubo bubo), Ural Owl (Strix uralensis), Golden Eagle (Aquila chrysaetos), Rough-legged Buzzard (Buteo lagopus), Goshawk, Gyrfalcon (Falco rusticolus) and Peregrine Falcon (Falco peregrinus) (Mikkola 1983, Semenov-Taishanski and Giljasov 1985).

According to Voous (1988), within the breeding range of the Hawk Owl, geographic limits appear to be set by the presence of suitable nesting trees. "What additional biotic factors, including competition with other species of owls and diurnal raptors determine its occurrence and abundance is not known." (Voous 1988). Voous (1988) added "As long as the natural communities of the northern taiga and birch zones remain, nothing apparently challenges its survival".

H. SPECIAL SIGNIFICANCE OF THE SPECIES

The Hawk Owl is holarctic, occurring from Scandinavia continuously through Russia and Siberia to Alaska and the full breadth of Canada (Voous 1988). It is high on the list of birds most sought after by birders.

The Hawk Owl is monotypic in its genus. Structurally, it could be described as an aberrant Glaucidium (Voous 1988).

Other species within the Hawk Owl's habitat that have suffered declines include the threatened pine marten (Martes americana) and woodland caribou (Rangifer tarandrus), the endangered cougar (Felis concolor) and wolverine (Gulo luscus), and the vulnerable Great Gray Owl.

I. EVALUATION AND PROPOSED STATUS

It appears that during the late 1800's and early 1900's the Hawk Owl was common throughout its range, showing up in large numbers in the south during periodic invasions in response to changes in small mammal availability (Austin 1932, Bent 1938, Hagen 1956, Guiguet 1960, Mikkola 1983, Cramp 1985). Since then, Hawk Owl numbers seem to have declined in response to various factors. However, the information available is not adequate to conclusively document this decline. Given that the Hawk Owl occurs throughout the boreal forest regions of Canada (Erskine 1977), there is likely a considerable population in spite of its low density.

The Hawk Owl does not need to be placed in any of the COSEWIC categories. Presumably there is enough habitat to maintain the existing population, and numbers are probably sufficient not to warrant a status. Fortunately, most raptor populations can compensate infrequent individual mortality such as shooting, disease and low-level human disturbances (Olendorff 1986). Populations are probably not declining at a rate requiring protection. Clearly, more research is needed on all aspects of the Northern Hawk Owl to better understand its behaviour, biology, and lifetime habitat requirements. This evaluation of current and past information on the Northern Hawk Owl therefore indicates that this species does not need to be placed in a COSEWIC category.

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L. ACKNOWLEDGEMENTS

Funding was provided by the Manitoba Department of Natural Resources, Wildlife Branch, Winnipeg, Manitoba. I wish to thank those who provided information and records; Saskia Koning, Harold Pinel, R. Wayne Campbell, Herbert Copland, Bill Munro, Michel Gosselin, Darrell Hutchinson, Christoph Rohner, Donald F. McAlpine, Dave Mossop, Carolyn Seburn, Mark Steinhilber, Rob Walker, Andrea MacCharles, Jean Gauthier, Jacques Larivee, Michel Lepage, Kay McKeever, Doug Collister, Shirley Peruniak, Michel Gosselin and Robert Gehlert. Thanks also to numerous individuals who responded to my requests for information. Thanks are due to James Duncan, Ken De Smet, Robert Nero, Spencer Sealy, Christoph Rohner and Doug Collister for their critical comments on early drafts. James Duncan kindly translated some French articles.