

The 1985-1986 Canadian Peregrine Falcon, *Falco peregrinus*, Survey

JULIA E. MURPHY

Canadian Wildlife Service, Ottawa, Ontario K1A 0H3

Present address: Faculty of Environmental Studies, York University, North York, Ontario M3J 1P3

Murphy, Julia E. 1990. The 1985-1986 Canadian Peregrine Falcon, *Falco peregrinus*, survey. Canadian Field-Naturalist 104(2): 182-192.

Results of Peregrine Falcon (*Falco peregrinus*) surveys carried out in 1985 and 1986 breeding seasons were used to assess the status of this species in Canada. Northern and west coast populations are stable or increasing. A new high number of nestings was reported in southern Canada. Comparison to the results of similar surveys in 1970, 1975 and 1980 shows the species is continuing to recover from the dramatic population decline it suffered prior to 1970, although numbers remain low in southern Canada.

Key Words: Peregrine Falcon, *Falco peregrinus*, populations, surveys.

Les inventaires des populations de Faucons pèlerins durant les saisons de reproduction 1985 et 1986 ont été utilisés pour établir la situation de cette espèce au Canada. Les populations du nord et de la côte ouest sont stables ou en croissance. Un nombre record de nids a été enregistré au sud du Canada. Une comparaison avec les inventaires de 1970, 1975 et 1980 montre que cette espèce continue de se remettre du déclin spectaculaire que les populations ont subi avant 1970, bien que celles-ci restent faible dans le sud du Canada.

Mots clés: Faucon pèlerin, *Falco peregrinus*, population, inventaires.

Peregrine Falcon (*Falco peregrinus*) surveys were carried out across Canada during the 1985 and 1986 breeding seasons. This report combines the results of these surveys to describe the status of this species in Canada. Similar surveys have been made at five-year intervals beginning in 1970 (Cade and Fyfe 1970; Fyfe et al. 1976; White et al. *this issue*). The 1970 survey documented severely reduced populations across Canada and Alaska and predicted possible extirpation of the species within the decade. The 1975 survey showed the Canadian population in continued decline. Results of the 1980 survey allowed guarded optimism; many population densities had improved and productivity was higher. In general, populations appeared to have stabilized, with decreases and increases on the local level.

The results of the 1985 and 1986 surveys are encouraging. More nestings, especially by captive-released birds, were reported in the eastern part of the *F. p. anatum* range (Figure 1), than in any previous survey. *F. p. anatum* populations in the Northwest Territories and the Yukon Territory were stable or increasing, although 1986 was an unproductive year for the northern Alberta population. *F. p. tundrius* populations in the Northwest Territories appeared to be reproducing at normal rates, but the single *F. p. tundrius* population in Yukon Territory was extirpated. Because of the increasing frequency of observations of captive-released birds, some information on captive-release programs in the provinces and

the Yukon Territory is included here, although no attempt has been made to evaluate these programs.

Eighteen areas in seven provinces and the two territories were surveyed by provincial and national governmental agencies and private groups. Three were surveyed in 1985, 13 in 1986 and 2 in both years. Neither Manitoba nor Saskatchewan was surveyed but observations of peregrines occupying territories were recorded in both provinces. Because all areas were not surveyed in the same year, it is possible that birds moving from one survey area to another might have been counted twice or not at all. This is considered so rare as to be inconsequential because of nest-site fidelity, except where survey areas are very close together.

Surveys across the range of *Falco peregrinus anatum* are reported here in detail because of the endangered status of this subspecies and the efforts invested in its reintroduction. Surveys of *F. p. tundrius* and *F. p. pealei* are described more briefly.

Summaries of surveys conducted include information on survey methods, survey results, other noteworthy observations of peregrines in 1985-1986, comparison with results of previous major surveys, and information on captive-release programs and population trends.

Methods

Breeding surveys of raptors are difficult. Several authors have described the errors, inherent biases,

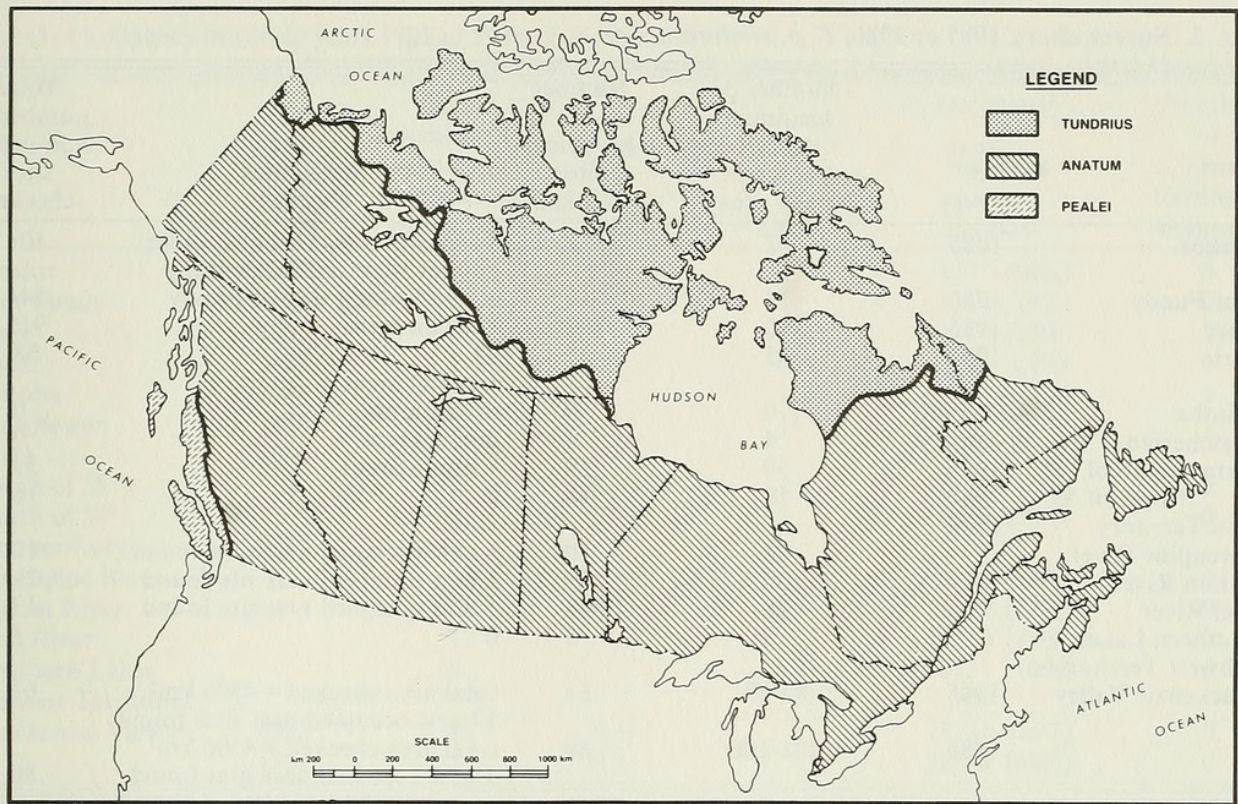


FIGURE 1. Known breeding distribution of the Peregrine Falcon in Canada (from Canadian *anatum* Peregrine Falcon Recovery Plan).

lack of comparability, and other shortcomings (Brown 1974; Postupalsky 1974, 1981). Newton (1979) pointed out that raptors make poor subjects for study of population dynamics because they breed at low densities, often in remote and

inaccessible places, and are frequently subject to human interference.

In analysing and consolidating the data from the surveys, discrepancies in survey terminology, choice of population parameters, and methods for

TABLE 1. Survey Terminology and Definitions.

Term	Definition	Comment(s)
Nest Site	The actual site of the nest.	More than one alternate nest site may be present within a single territory.
Occupied Nest Site or Territory	A nest site or territory occupied by one or two territorial adults during all or some part of the breeding season.	The terms <i>active site</i> and <i>active territory</i> have been used to describe such a diversity of situations that they have become meaningless and raptor biologists should avoid using them.
Breeding Pair	A pair which laid at least one egg.	
Productive Pair	A pair which raised at least one chick to fledging, or, if actual fledging was not proven, raised at least one chick to an advanced stage of development from which the chick was assumed to have fledged.	For the purpose of Canadian surveys this term is more useful than the term <i>Successful pair</i> and its definition "a pair fledging at least one young", because it is often impossible to determine from infrequent aerial surveys whether nestlings fledge or not. C. Shank offered this definition based on the observation that nestling mortality is low from halfway through the nestling period to fledging. Brown (1974) identified the early part of the nestling period as one of the two times of strain in the breeding cycle of raptors. During this critical time only the male is available to obtain food for the young and the female. Later, food supply for the young is more assured because both parents hunt for the young and themselves.

TABLE 2. Survey effort, 1985 or 1986, *F. p. anatum*.

Area	Year of survey	Number of historical sites known in survey area†	Number of historical sites checked	Other areas/sites checked	Total number of non-urban sites checked
Labrador	1985	2	2	8 reported sites checked; other habitat surveyed incidentally	10+
Bay of Fundy	1986	14	14	all cliffs along Bay of Fundy	14+
Quebec	1985	10	6*	+ urban areas	91*
Ontario	1985	35	35	23 + urban areas	58
Manitoba	no survey	0	0	urban areas	0
Saskatchewan	no survey	4	0	urban areas	0
Alberta South of 58°	1986	59	59	+ urban areas	59
North of 58°	1986	18	16	0	16
Yukon Territory	1986				
Porcupine River		28	10	6 new occupied nest sites found	10
Yukon River		30	29	1 new occupied nest site found	29
Peel River		28	13	1 new occupied nest site found	13
Southern Lakes		3	3	0	3
Northwest Territories					
Mackenzie Valley	1985	84-89	61	total area checked = 4500 km ² 17 new occupied nest sites found	61
	1986	101-106	80	total area checked = 4500 km ² 5 new occupied nest sites found	80

†Does not include sites found in survey year.

*including Montreal

their calculation, were encountered. The following discussion of these methodological concerns, as well as the issues of historical sites, non-breeding birds, timing of surveys and yearly population fluctuations, is intended to clarify the information presented in this report and contribute to the standardization of future surveys.

Survey Terminology

A major obstacle to interpretation of the survey data was inconsistent use of survey terminology. Various researchers used different terms to describe the same phenomenon; occasionally the same term was used to describe different phenomena in different survey reports. The terms and definitions in Table 1 have been reviewed by all surveyors and are used throughout this report. These terms should become standard terminology for future survey reports.

Historical Sites

As in previous surveys, particular attention was paid to historical nest sites as percent occupancy of historical sites is considered an indication of relative population size. Although this concept is valid, it is not equally applicable in all areas of Canada, as discussed below:

1). In many areas historical records of peregrines are rare, not necessarily because the species was rare but possibly because it was not observed or observations were not recorded. For example, there are only 10 documented historical nest sites in Quebec south of Ungava Bay.

2). The number of historical sites known is generally a total of sites used in many different years, including those used regularly and those used only infrequently, sites used only once in the recent past, perhaps even unsuccessfully, and sites that are no longer suitable nesting habitat because of development or disturbance. Long-term population records from Britain show that individual sites are not used with equal frequency. Ratcliffe (1980) categorized historical sites according to the average number of times used per decade.

3). Peregrines are known to use alternate nest sites within the same territory. When only one of the alternate sites is known, surveyors may or may not record observations of use of another site within the same territory as occupation of a historical territory. This new site may or may not then be considered a separate historical site.

4). Expanding and declining populations may behave differently from stable populations and from each other in their selection of nest sites. It could be misleading to assume that an expanding population will re-occupy traditional nest sites first.

It is clear that the percentage occupancy figure should only be interpreted in the context of the extent of knowledge of historical populations in a given area, and caution should be used in comparing this figure for different areas.

Non-Breeding Birds

Observations of non-breeding birds (i.e. lone adults or sub-adults and non-breeding pairs)

TABLE 3. Occupancy in survey years 1985 or 1986, *F. p. anatum*.

Area	Year of survey	Total number of territories Occupied in survey year	Territories occupied by:		Occupancy of historical sites checked ⁴	Number of urban territories occupied
			a lone adult	a pair		
Labrador	1985	2	0	2	1/2 (50%)	0
Bay of Fundy	1986	1 ¹	1	1	1/14 (7%)	0
Quebec	1985	1	0	1	1/6 (10%)	1
Ontario	1985	1	1	0	0/35 (0%)	1
Manitoba	1986	1	0	1	-	1
Saskatchewan	1986	2	1	1 ²	-	1
Alberta	1986					
South of 58°		2	0	2	0/59 (0%)	2
North of 58°		6	1	5	6/16 (38%)	0
Yukon territory	1985					
Porcupine River		14			8/10 (80%)	0
Yukon River		22	N.D. ³		21/29 (72%)	0
Peel River		12			11/13 (85%)	0
Southern Lakes		0			0/3 (0%)	0
Northwest Territories						
Mackenzie Valley	1985	45	N.D. ³		28/61 (46%)	0
	1986	57	N.D. ³		52/80 (65%)	0

¹Both lone adult and pair occupied same territory.²Male Peregrine Falcon mated with Female Prairie Falcon.³Not determined. Surveys could not determine whether sites were occupied by lone adults or pairs.⁴Does not include new sites found in survey year.TABLE 4. Reproduction in "remnant" *F. p. anatum* populations¹ in Northern Alberta, Yukon Territory and Northwest Territories¹.

Area	Number of occupied territories ²	Number of productive pairs	Average clutch size	Total young produced by productive pairs	Average no. young produced per occupied territory = productivity	Average no. young produced per productive pair
Alberta						
North of 58° - 1986	6	0	3.8 (n = 5)	0	0	0
Yukon Territory - 1986						
Porcupine River	14	11	N.D.*	29	2.0	2.6 ± 1.0
Yukon River	22	18	N.D.	50	2.2	2.8 ± 0.9
Peel River	12	10	N.D.	23	1.9	2.3 ± 0.8
Southern Lakes	0	-	-	-	-	-
Northwest Territories						
Mackenzie Valley - 1985	45	36	3.5 (n=10)	76 ³	1.7	2.1 ± 0.9
Mackenzie Valley - 1986	57	36	2.9 (n = 8)	90 ⁴	1.6	2.5 ± 0.9

*Not determined.

¹Does not include data on fostered and captive-reared young.²Includes territories occupied by lone adults and pairs.³Seven of 36 broods could not be counted. Figure given is mean brood size times number of productive nests.⁴Six of 36 broods could not be counted. Figure given is mean brood size times number of productive nests.

TABLE 5. Reproduction in “reintroduced” and Labrador *F. p. anatum* populations in survey and non-survey years¹.

Area	Year	Number of lone adults on territories	Number of pairs occupying territories	Number of breeding pairs	Number of eggs in nest	Number of young in nest	Number of young fledged
Labrador	1985*	0	2	1	4	4	3
	1986*	0	2	1	2	2	?
Bay of Fundy	1986*	1	1	0	-	-	-
Quebec	1985*	0	1	1	3 ²	0	-
	1986	1	4	3	2	2	2
					1	1	1
					3	0	0
Ontario	1985*	1	0	-	-	-	-
	1986	1	1	1	1	1	1
Manitoba	1986	0	1	0	-	-	-
Saskatchewan	1985	1	1	1 ³	2	2	0 ⁴
	1986	1	1	1 ³	?	?	?
Alberta	1986*	0	2	2	3 ⁵	1	1
					4 ⁶	3	3

Young produced per occupied territory (productivity) (1985/86 average) = 12/23 = .52
Young produced per productive pair (1985/86 average) = 12/11 = 1.1.

*indicates survey year
¹Does not include data on fostered young.
²Female laid one egg in each of 3 different locations.
³Pair consisted of male Peregrine Falcon and female Prairie Falcon.
⁴Hybrid young replaced by 3 captive-bred *anatum* young.
⁵Edmonton
⁶Calgary

occupying nesting territories during the breeding season are very important. These instances of non-breeding are difficult to interpret as they may represent infertile birds or they may indicate that the population is expanding. For this reason, productivity calculated from all occupied territories is the most valuable parameter of reproductive success of a population (see below under “Parameters”). The proportion of territories occupied by lone birds is an indication of the size of the non-breeding adult population and may permit inferences about recruitment rates and the status of the population (Postupalsky 1974).
Unfortunately, because lone adults and pairs without eggs are less attached to the nest site than are breeding pairs, they are more difficult to count accurately. Careful observations early in the season are required to find this component of the population and to determine that pairs have not attempted, unsuccessfully, to breed in a site unknown to the observer. Repeat visits may be necessary to confirm that the bird(s) is/are actually occupying a territory. In the case of aerial surveys, when a single bird is seen on a territory, it is often impossible to determine whether the bird has a mate or not.

Timing

Fraser et al. (1983) and Postupalsky (1974) have described the biases introduced by surveys done at

different stages of the breeding cycle. Surveys done at different times in different years are difficult to compare.

Yearly Fluctuations

Breeding populations of peregrines may show substantial yearly fluctuations (Court et al., this issue). The most obvious cause of these fluctuations is weather. For example, in 1986 a severe wind and rain storm in northern Alberta destroyed 9 of 19 eggs and caused one nest to be abandoned; a late storm hit the Rankin Inlet area and many *F. p. tundrius* nests failed or were abandoned. Where populations are surveyed only once every five years, the exceptional nature of any one breeding season may not be immediately obvious.

Parameters

Brown (1974), Postupalsky (1974, 1981) and Fraser (1978, in Postupalsky 1981) all called for the standardization of population parameters and selected productivity as the most useful parameter of breeding success. Productivity is the average number of fledging or large young per occupied nest with known outcome, or the average number of young produced or recruited into the adult population per territorial pair. Previous surveys have reported this as “young per pair”. As mentioned above, non-breeding pairs and single

TABLE 6. Results of Ungava Bay surveys 1970, 1975, 1980 and 1985.

a) Occupancy						
Year	Total Historic Sites	Number Historic Sites Checked	Unoccupied	Lone Adult	Pair	
1970 ¹	15	15	3	3	9	
1975 ¹	27	25	14	2	9	
1980 ¹	28	21	11	0	10	
1985 ²	28	20	5	0	23	
					(8 new sites found)	
b) Reproduction						
Year	Pairs Checked	Pairs with young	Percent of total pairs	Total young in nests	Young per pair on territory	Young per pair with young in nest
1970 ¹	9	7	78	12	1.3	1.7
1975 ¹	9	9	100	16	1.8	1.8
1980 ¹	10	10	100	27	2.7	2.7
1985 ²	23	19	83	61	2.7	3.2

¹White et al. (this issue).
²Lepage and Caron (1986)

birds assumed to have mates are included in this calculation and should be surveyed as accurately as possible. When the actual number of young in each nest known to be productive cannot be counted, an average figure for productive nests in which young were counted can be used. This introduces an element of error, but in the case of Yukon Territory and the Northwest Territories there is no alternative. Many raptor surveys also report young per successful pair and this has been done here.

Results

Survey effort is presented in Table 2, occupancy in Table 3, and reproduction in western and eastern Canada, respectively, in Tables 4 and 5. For two regions, Ungava Bay and Alberta south of 58°, 1985 or 1986 survey results are presented along with historical survey data for 1970, 1975 and 1980 (Tables 6 and 7).

Regional Summaries

LABRADOR COAST: — J. Brazil, Wildlife Division, Department of Culture, Recreation and Youth, P.O. Box 4750, St. John's, Newfoundland A1C 5T7.

1985 Survey: In 1985, 10 reported nest sites were visited between 2 July and 14 August. Two of these were sites where breeding pairs had been observed during the 1970 survey. Other potential habitat was investigated in the course of checking the ten sites (Figure 2). About 110 km of coastline was searched intensively by boat. A pair was found breeding at the historical site in Groswater Bay, Hamilton Inlet. On 31 July the nest contained four downy chicks, one of which was dead (Table 5). No other peregrines were seen. Other observers also discovered one other pair and two single adults. The pair was observed regularly at Okak Bay, but no nest was located. Lone birds were found closer to Hamilton Inlet in

TABLE 7. Survey results 1980-1986, Alberta, South of 58°

Year	Total Number Known Territories	Number checked	Unoccupied	Lone Adults	Pairs
1970	29	29	27	1	1
1975	35	31	30	1	0
1980	53	53	53	0	0
1986	59	59	59	0	2 urban ¹

¹Not included in 59 known territories.

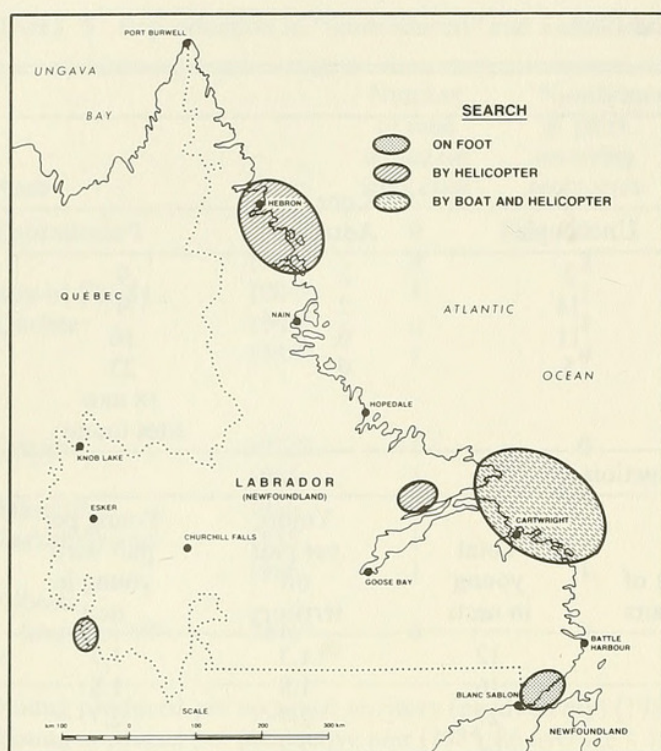


FIGURE 2. Areas in Labrador surveyed in 1985.

separate areas, but because they were only observed once during the breeding season, it was not possible to determine if they were actually occupying territories.

1986 Survey: In 1986 the coastline between Cartwright and Makkovik was surveyed systematically by boat and helicopter. The historical site in Groswater Bay was productive again; two young are believed to have fledged. Another pair was found occupying a territory at Cape Harrison on 28 July but no nest was found.

A literature search has uncovered a number of additional historical records of peregrine nestings in Labrador, but none on the island of Newfoundland. These records date back as far as 1966 and seem to indicate that historically peregrines nested along many sections of the Labrador coast and possibly inland, not just in the areas surveyed in the early and mid-seventies.

The Labrador coast was the last area in eastern Canada where peregrines are known to have nested prior to the beginning of captive-releases. During a 1970 aerial survey of 200 km of coastline and offshore islands two nests with young were discovered, but the last known record of a productive nest in Labrador is from 1971. Continued investigations of nesting territories and reported observations up to 1980 failed to find any evidence of peregrines.

The return of Peregrine Falcons to the Labrador coast between 1980 and 1985 is a hopeful sign, particularly since no releases have been made in Newfoundland and Labrador. It will be important to survey this area regularly in the future.

BAY OF FUNDY: — B. Johnson, Canadian Wildlife Service, P.O. Box 1590, Sackville, New Brunswick E0A 3C0.

On 1 July 1986 both the Nova Scotia and New Brunswick sides of the Bay of Fundy were surveyed. All known historical and potential nest cliffs were examined from a Cessna 337B aircraft. A reported inland historic site inland at Todd Mountain, York County, New Brunswick, was checked from an aircraft in late July. No peregrines or evidence of occupancy were found during these surveys.

During 1986 a captive-release pair of adult peregrines occupied a territory near a hack site in Fundy National Park but did not nest. A lone male was also present in the same territory early in the summer. This may have been the sub-adult bird from a US captive release observed at the same site in 1985.

Surveys carried out in the Maritime provinces in 1970, 1975, and 1980, including a comprehensive survey of the Bay of Fundy in 1975 and a survey of the Nova Scotia side in 1980, failed to find any evidence of current or recent occupancy at any site.

QUEBEC: — M. Lepage and M. Caron, Direction de la faune terrestre, Ministère du Loisir, de la Chasse et de la Pêche, 150 boul. St-Cyrille est, Québec, Québec, G1R 4Y3.

Southern Québec: During the last week in June through the third week in July 1985 observers on foot or in helicopter examined, on one or two separate occasions, each of 91 potential nest sites within the area of southern Québec shown in Figure 3. Six of these were historical sites and 85 were potential sites identified by examination of topographical maps and aerial photos.

The only occupied territory found in 1985 was in downtown Montreal. During the breeding season four different adults were present on this territory, including a female that laid three infertile eggs in three different locations. A team from the Macdonald Raptor Research Centre later intervened and provided two nestlings which the final pair raised to fledging.

In 1970 no evidence of peregrines was found at any historical sites, nor in two areas north of the St. Lawrence and east of Québec City selected for examination because of their abundant cliffs and potential nesting sites. The conclusion then was that the peregrine had disappeared as a breeding bird from southern Québec. Québec was not surveyed again until 1980 when approximately 54 potential and historical sites in southern Québec were surveyed and a successful nesting was documented at a historical site in the Eastern Townships.

The attempted nesting in Montreal in 1985 was the eighth recorded over the six breeding seasons from 1980-85. A total of 11 wild young and 2 fostered young were raised in these eight nests. In

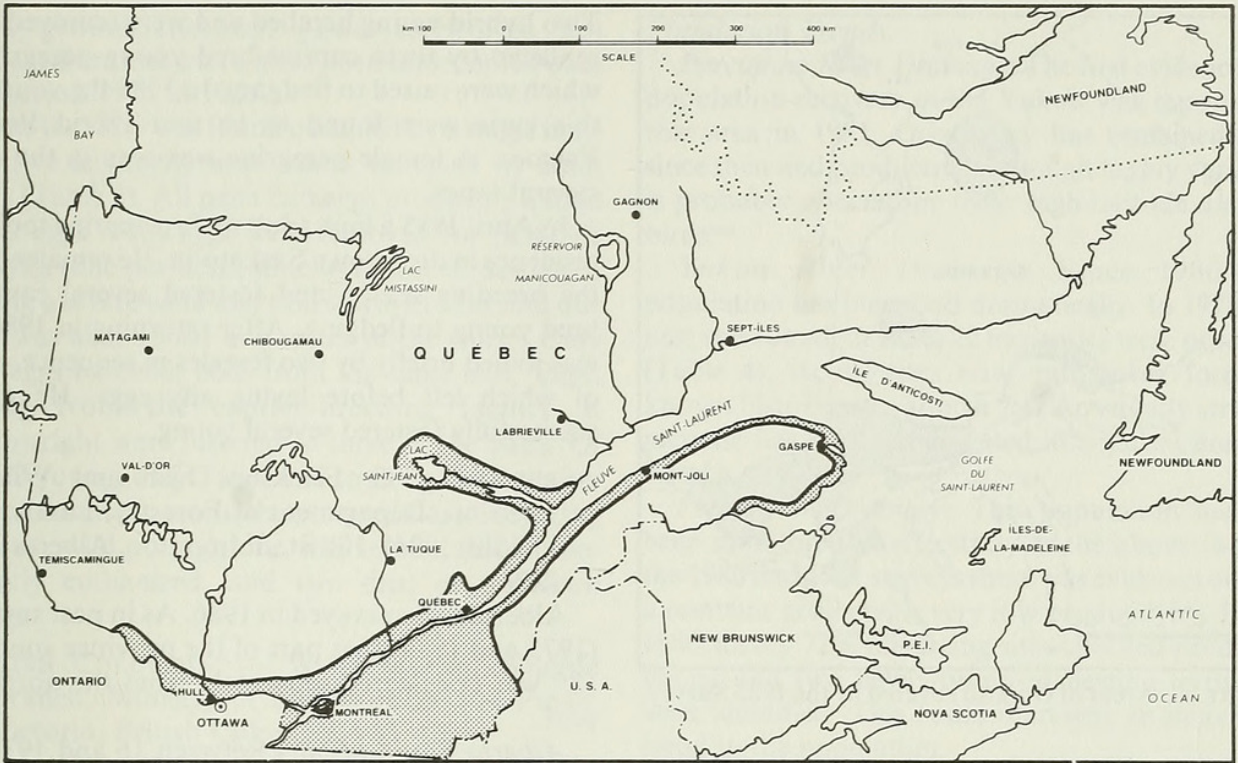


FIGURE 3. Area of southern Quebec covered by the 1985 Survey.

1986 four territories were occupied, three by pairs and one by a lone male. Two nests fledged a total of three young.

Ungava Bay: It has not yet been established whether the peregrines nesting in the Ungava Bay area belong to *F. p. tundrius* or the *F. p. anatum*.

In 1985 four areas in the Ungava Bay area were surveyed: the Gyrfalcon Islands; the Leaf River basin; the Payne-Arnaud River, from its mouth to the first rapids; and the Koksoak River, north of Kuujuaq. The Koksoak River was surveyed by canoe; all other areas were surveyed once by helicopter during the last week in July.

Survey results are shown in Table 6 together with the results of the 1970, 1975, and 1980 surveys.

The areas surveyed in the Ungava Bay region have not been the same each time, so it could be misleading to compare the survey results directly. However, the population does seem to be reproducing effectively. Note that "young per pair with young in nest" may be an over-estimate of productivity because the chicks observed were quite young.

ONTARIO: — Wildlife Branch, Ministry of Natural Resources, Whitney Block, Queen's Park, Toronto, Ontario M7A 1W3.

Areas of eastern, central and northern Ontario were surveyed between early May and late July 1985 (Figure 4). Eastern (more accessible) sites were reached by canoe; northern and central sites were reached by large boat or aircraft. Each site was visited once and whenever possible observed

for five hours. Both historical (35) and potential (23) sites were visited. No evidence of nesting falcons was found at any of the 58 sites visited. A lone male occupied a territory in Arnprior.

Surveys of all known historical sites and some potential sites in 1970 and 1980, and a partial survey of historical sites in 1975 failed to discover evidence of recent or current occupancy of any sites or non-breeding individuals. As in other provinces, it is possible that peregrines are nesting or have nested unobserved in small numbers in remote areas of the province.

Although the results of the 1985 survey were not promising, encouraging finds were made in Ontario both before and after the year of the survey. In 1986 a successful nesting was documented at a non-urban site. It was not determined whether the adults were wild or captive-released birds. In 1983 a pair of peregrines nested in Arnprior. These birds had been released in Hull in 1980 and 1981. Unfortunately the female was shot and killed and the two nestlings disappeared. The male returned to the site each year up to and including 1986 but has failed to attract a mate.

MANITOBA: — Wildlife Branch, Natural Resources, Box 24, 1495 St. James St., Winnipeg, Manitoba R3H 0W9.

No survey was carried out in Manitoba in either 1985 or 1986. If Manitoba ever had a peregrine population it was probably very small. White et al. (this issue) were unaware of any confirmed nest

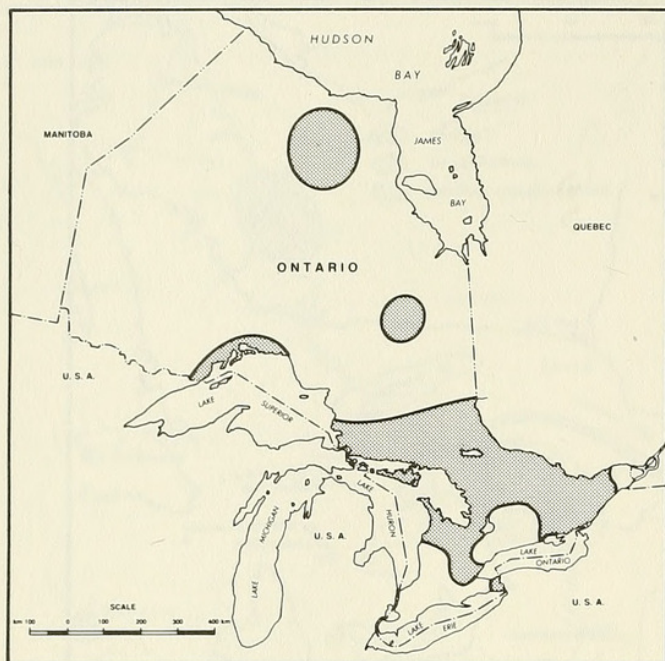


FIGURE 4. Areas of Ontario covered by the 1985 Survey.

records for the province but Bechard (1981) reported a clutch of peregrine eggs collected near Gladstone, Manitoba, in 1887. No surveys have been conducted in Manitoba, with the exception of a brief unproductive survey in 1980 of an area of possible habitat along the lower Churchill River.

In 1986, a pair of captive-released adult Peregrine Falcons was resident in downtown Winnipeg for more than six weeks and went through the motions of courtship, although no eggs were laid (Table 3). The female had been hacked in 1983 from the Montreal area, the male from Winnipeg in 1984. Unfortunately the male suffered an untimely death in a collision with a window or a wire.

SASKATCHEWAN: — Lynn Oliphant and Betsy Haug, Saskatchewan Cooperative Falcon Project, Department of Veterinary Anatomy, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0.

No survey was carried out in Saskatchewan in 1985 or 1986. There are few confirmed records of peregrine nests in the province. Neither a 1970 survey of suitable habitat in southwestern Saskatchewan nor a 1980 survey of a promising area north of Lake Athabasca turned up any evidence of breeding peregrines. However, recent sightings during the breeding season made by reliable observers in the area surrounding Uranium City (Lake Athabasca) continue to suggest a small population in that area (L. Oliphant, personal communication).

In 1985 a Saskatchewan rural-released male (1980) paired with a Prairie Falcon (*Falco mexicanus*) at a historical Prairie Falcon eyrie along the South Saskatchewan River (Table 3).

Two hybrid young hatched and were removed and replaced by three captive-bred young peregrines, which were raised to fledging. In 1986 the young at this eyrie were found to be non-hybrid Prairie Falcons. A female peregrine was seen in the area several times.

In April 1985 a lone adult male peregrine took up residence in downtown Saskatoon. He remained for the breeding season and fostered several captive-bred young to fledging. After returning in 1986 he was joined briefly by two females in sequence, each of which left before laying any eggs. He again successfully fostered several young.

ALBERTA: — G. Erickson, Fish and Wildlife Division, Department of Forestry, Lands, and Wildlife, 9945-108 St., Edmonton, Alberta T5K 2C9.

Alberta was surveyed in 1986. As in past surveys (1975 and 1980) that part of the province south of 58° was considered separately from the northern part.

Alberta South of 58°: Between 16 and 19 May 1986 a survey of all known historical sites (59) and other potential and reported sites was conducted by helicopter. No peregrines were observed. One hundred and thirty-one young captive-reared peregrines have been released over the period 1976-1985 in central and southern Alberta. Single pairs have established in the urban centres of Calgary and Edmonton, and all four adults are from the captive-release program (Table 5). The Edmonton pair established a territory in 1981 and nested in 1982; the Calgary pair established a territory and nested in 1984. Pairs at both these locations successfully fledged their own young in 1986.

Surveys documented the disappearance of breeding peregrines from natural habitat in southern Alberta and their re-appearance in urban centres (Table 7). Prior to the urban nestings the last confirmed successful nesting occurred in 1972 (Fyfe et al. 1976).

Alberta North of 58°: This area includes the only known remnant population of Peregrine Falcons in the prairie provinces. It has been intensively managed to maximize production since 1971 and surveyed annually since 1969. In no way can the results from this area be considered representative of a natural population.

Over the period 1975-1986, 95 captive-raised young have been fostered to wild parents. Other manipulations have included double-clutching and the use of dummy eggs to keep pairs on sites until captive-reared young were available for fostering. Banded birds form a significant portion (55% in 1986) of the adult population and captive-released birds breed regularly in the study area.

In May and June of 1986, sixteen of the 18 distinct peregrine territories previously identified

were ground-checked. (Two territories not surveyed are known to have been unoccupied over the period 1974 to 1985.)

One territory was found occupied by a single male and five territories were found occupied by adult pairs (Table 3). All pairs laid eggs producing a total of 19 eggs. Five eggs were removed for pesticide analysis (one per nest), nine were lost or destroyed during a severe wind and rain storm in May and one nest was abandoned as a result of the storm. Only two eggs hatched, both from the same nest. Eight young from the captive-breeding facility at Wainwright were fostered to three of the pairs. Of the 10 young, only 3 survived to fledging. Four are believed to have succumbed to predators (including the two wild young), one was injured and subsequently euthanized, and two died of unknown causes.

BRITISH COLUMBIA: — W. T. Munro, Wildlife Branch, Ministry of Environment and Parks, Victoria, British Columbia V8V 1X5.

Coastal populations of *Falco peregrinus pealei* in British Columbia were investigated in the Queen Charlotte Islands, Gulf Islands, and northern Vancouver Island in 1986. Each area was surveyed once during the breeding season by boat and/or helicopter; therefore only data on occupancy are available. Surveyors estimated at least 57 occupied territories in the Queen Charlotte Islands, four in the Gulf Islands, and nine on northern Vancouver Island (Checleset to Gordon Channel).

YUKON TERRITORY: — D. Mossop, Fish and Wildlife Branch, Dept. Renewable Resources, P.O. Box 2703, Whitehorse, Yukon Territory Y1A 2C6.

In the Yukon Territory there are five distinct subpopulations of Peregrine Falcons, each occupying different drainage basins separated by extensive mountain ranges. The subpopulation inhabiting the arctic coastal drainage is considered to be *F. p. tundrius*, and the four others, considered to be *F. p. anatum*, inhabit the Porcupine, Yukon, and Peel River drainages, and the nesting habitat associated with larger lakes in the southern portion of the territory. All of the subpopulations have been surveyed regularly since 1973, although some have been investigated more frequently than others. Over the period 1973-1986, they have demonstrated different population dynamics.

In 1986 each of the five populations was surveyed once or twice during the breeding season, either by helicopter or by boat (ground survey). The Yukon River population was surveyed from the ground at regular intervals during the breeding season. All or most of the known historical sites in each area were checked.

Population Trends

Porcupine River Drainage: The first evidence of a population recovery in the Yukon was reported in this area in 1981. Occupancy has remained high since then and productivity, though highly variable, is probably normal for these high-latitude *anatum* birds.

Yukon River Drainage: Since 1980 this population has increased dramatically. In 1978 one nest was found, in 1986, 22 territories were occupied (Table 4). Active sites now outnumber formerly known historic sites almost 2:1. An equally striking increase has been documented in adjacent areas of Alaska.

Peel River Drainage: This population has not been monitored as effectively as the above two. In the 1980 and 1981 surveys there was evidence of only a remnant group with very low productivity. In the 1986 survey 72% of nesting sites checked produced young and two newly-occupied nesting territories were identified. This could represent an increasing trend in the population.

Southern Lakes: This population is believed to be extirpated. It has been poorly known but visits to historic sites have failed to discover any evidence of occupancy.

Arctic Coastal Drainage: (*F. p. tundrius*) Annual surveys since 1980 have covered most of the former range and all known historic sites. A dramatic decline has been reported. It is believed that the population ceased to breed in 1981, and no adults have been observed since then.

NORTHWEST TERRITORIES: — C. Shank, Wildlife Population Management, Department Renewable Resources, Yellowknife, Northwest Territories X1A 2L9.

Both *F. p. anatum* and *F. p. tundrius* inhabit the Northwest Territories. The *F. p. anatum* population inhabits the Mackenzie Valley.

Anatum Population: The Mackenzie Valley has been surveyed for Peregrine Falcons annually since 1969, except 1983 (Bromley and Matthews, 1988).

In 1985 and 1986, intensive helicopter surveys were made of the Mackenzie Valley between Norman Wells and Inuvik. In both years, a first survey was made in mid-June to document egg-laying followed by a second survey in mid-to-late July to quantify production. Each survey covered approximately 4 500 km² checked most but not all historical sites. Survey effort was equivalent in both years. Seventeen new nest sites were found in 1985 and five in 1986 bringing the total number known in the Mackenzie Valley to somewhere between 101 and 106.

Bromley and Matthews (1988) recently analysed the results of annual Mackenzie Valley peregrine surveys from 1969 to 1985. They concluded that the peregrine population declined by approximately

35% in the late 1970s but returned to earlier levels by the mid-1980s. They found a parallel trend in the proportion of occupied sites where young were produced, but no observable trend in the mean number of young per productive nest. By 1985 the rate of population increase appeared to be declining or the population was levelling off at a slightly lower level than during the early to mid-1970s. However, the 1986 occupancy of known sites (65%) and the calculated production of 90 young were higher than any previously recorded, which suggests the population may still be increasing.

Tundrius Population: Bromley (1988) summarized the data available on populations in the Kitikmeot, Baffin, and Keewatin regions for the period 1982-1985. He concluded that all areas surveyed supported populations reproducing at normal rates.

In 1986, *tundrius* peregrines were surveyed at Rankin Inlet (for the sixth year) and in the Kitikmeot region. Birds at both areas showed depressed reproductive success as a result of abnormally bad weather.

Acknowledgments

Appreciation is expressed for the invaluable contributions of the agencies and people who carried out the surveys and provided their results and feedback on earlier drafts of this document. T. C. Dauphiné assisted with all stages of preparation of this report, I. M. Price and A. J. Erskine reviewed the manuscript.

Literature Cited

- Bechard, M. J.** 1981. Historic nest records of the Peregrine Falcon in southern Saskatchewan and southern Manitoba. *Blue Jay* 89(3): 183.
- Bechard, M. J.** 1982. Further evidence for a historic population of Peregrine Falcons in southern Saskatchewan. *Blue Jay* 40(2): 125.
- Bromley, R. G.** 1988. Status of Peregrine Falcons (*Falco peregrinus tundrius*) in the Kitikmeot, Baffin, and Keewatin regions, Northwest Territories, 1982-1985. Pages 51-58 in *Peregrine Falcon populations: their management and recovery*. Edited by T. Cade, C. White, J. H. Enderson and C. G. Thelander. The Peregrine Fund.
- Bromley, R. G., and S. Matthews.** 1988. Status of Peregrine Falcons (*Falco peregrinus anatum*) in the Mackenzie River Valley, Northwest Territories, 1969-1985. Pages 59-64 in *Peregrine Falcon populations: their management and recovery*. Edited by T. Cade, C. White, J. H. Enderson and C. G. Thelander. The Peregrine Fund.
- Brown, L.** 1974. Data required for effective study of raptor populations. Pages 9-20 in *Management of raptors*. Edited by F. M. Hamerstrom, B. E. Harrell, and R. R. Olendorff. Raptor Research Report No. 2, Raptor Research Foundation, Vermillion, South Dakota. 146 pages.
- Cade, T. J., and R. W. Fyfe.** 1970. The North American peregrine survey. *Canadian Field-Naturalist* 84: 231-245.
- Court, G. S., C. C. Gates, D. A. Boag, J. D. MacNeill, D. M. Bradley, A. C. Fesser, J. R. Patterson, G. B. Stenhouse, and L. W. Oliphant.** 1990. A toxicological assessment of Peregrine Falcons, *Falco peregrinus tundrius*, breeding in the Keewatin District of the Northwest Territories, Canada. *Canadian Field-Naturalist* 104(2): 255-272.
- Fraser, J. D., L. D. Frenzel, J. E. Mathisen, F. Martin, and M. Shough.** 1983. Scheduling Bald Eagle reproduction surveys. *Wildlife Society Bulletin* 11: 13-16.
- Fyfe, R. W., S. Temple, and T. J. Cade.** 1976. The 1975 North American Peregrine Falcon survey. *Canadian Field-Naturalist* 90: 228-273.
- Lepage, M., et M. Caron.** 1986. Quatrième inventaire quinquennal (1985) du faucon pèlerin au Québec. Ministère du Loisir, de la Chasse et de la Pêche, Québec. 24 pages.
- Newton, I.** 1979. Population ecology of raptors. Buteo Books, Vermillion, South Dakota. 399 pages.
- Postupalsky, S.** 1974. Raptor reproductive success: some problems with methods, criteria and terminology. Pages 21-31 in *Management of raptors*. Edited by F. N. Hamerstrom, B. C. Hassel, and R. R. Olendorff. Raptor Research Report No. 2, Raptor Research Foundation, Vermillion, South Dakota. 146 pages.
- Postupalsky, S.** 1981. Censusing nesting populations and measuring reproductive success. Pages 151-158 in *Eagle Valley Environmentalists Technical Report BED-81*. 8 pages.
- Ratcliffe, D. A.** 1980. The Peregrine Falcon. Buteo Books, Vermillion, South Dakota. 416 pages.
- White, C. M., R. W. Fyfe, and D. Lemon.** The 1980 North American Peregrine Falcon survey. *Canadian Field-Naturalist* 104(2): 174-181.

Received 22 February 1988

Accepted 14 August 1989



Murphy, Julia E. 1990. "The 1985-1986 Canadian Peregrine Falcon, *Falco peregrinus*, survey." *The Canadian field-naturalist* 104(2), 182–192.
<https://doi.org/10.5962/p.356345>.

View This Item Online: <https://www.biodiversitylibrary.org/item/106989>

DOI: <https://doi.org/10.5962/p.356345>

Permalink: <https://www.biodiversitylibrary.org/partpdf/356345>

Holding Institution

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Sponsored by

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Ottawa Field-Naturalists' Club

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.