Progress Report

1984 Peregrine Release in Nova Scotia
(with notes on the New Brunswick release)

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CANADIAN WILDLIFE SERVICE
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Introduction

The Peregrine Falcon (Falco peregrinus) is a cosmopolitan species which has been recorded from all continents except Antarctica. Three subspecies occur in Canada: pealei, a relatively non-migratory form, inhabits the Northwest coast of North America; tundrius breeds north of the tree line and migrates as far south as South America; anatum formerly nested from the tree line south to Arizona and Mexico and is more or less migratory.

A review of the status of peregrine populations in Europe and North America in 1965 (Hickey, 1969) indicated serious reductions in the number of breeding birds in Europe and eastern North America. Surveys in Canada in 1970 and 1975 (Cade and Fyfe, 1970; Fyfe et al., 1976) resulted in no recorded active nests of the subspecies anatum east of Alberta by 1975, and severe reductions in western anatum and northern tundrius populations.

The decline in peregrine populations was first attributed to the use of pesticides in Great Britain in the early 1960's (Ratcliffe, 1980). Recent work has clearly established that organochlorine pesticides can cause symptoms observed in the field during the population decline, including eggshell thinning and egg breakage, reduced hatching success, reduced brood size and territory desertion (Cade et al., 1968; Peakall, 1976; Ratcliffe, 1970). The reduction in use of those pesticides, primarily DDT and the dieldrin group, in North

America since the early 1970's has resulted in reduced residue levels in some prey species used by peregrines. However, because breeding populations are often of local origins, severely reduced and extirpated populations may require assistance to return to former numbers.

The Canadian Wildlife Service captive breeding program was begun at Wainwright, Alberta, following the recommendations of the Federal-Provincial Wildlife Conference in 1970. An objective of that program was to provide peregrines for release into former range when conditions became suitable for survival. After several years of testing techniques, the standard method used for release now is hacking. Fledgling birds are released at each site for several years until a total of about 30 birds has been released.

Peregrines are known to have nested at fifteen sites in the Maritime Provinces (Fyfe et al., 1976). The most recent breeding records are about 1962 on the federal building in Charlottetown (Stocek and Pearce, 1978); 1955 near Advocate, Nova Scotia (Tufts, 1973); and 1948 on Grand Manan and Fundy National Park (or possibly 1960 in Fundy National Park), New Brunswick (Squires, 1952; 1976).

The first experimental peregrine releases from the Canadian Wildlife Service breeding facility at Wainwright, Alberta, took place in 1974. Currently, anatum peregrines are released across Canada from Alberta to the Maritimes.

Three peregrines were released each year at a site in Nova Scotia in 1982 and 1983 (Bateman, 1982; Bateman, 1983), and an

equal number of birds at a New Brunswick site. This report summarizes the 1984 release of eight peregrines in Nova Scotia and includes notes on the release of eight birds at Fundy National Park New Brunswick.

Peregrine prey counts were begun in 1984 preliminary to establishing an index of prey abundance near the Cape d'Or release area. Although released peregrines are not expected to return to the hack site to nest, it is very likely that the historical nest ledges in the area will be used. Also, a good supply of prey in the area will facilitate the survival of the hack-released birds. If a method is devised which will give a reliable prey index, that method can then be used at other sites to compare abundances. The 1984 survey was preliminary and counts were carried out only on seven days.

Description of Study Area

Peregrines were released at the same sites in Nova Scotia and New Brunswick in 1984 as were used in 1982 and 1983 (Figure 1). Both sites were near historical peregrine eyries. The cliff at Cape d'Or Nova Scotia is near a nest site reported active in 1955 (Tufts, 1973); Point Wolfe, Fundy National Park, is near a cliff used by nesting peregrines in 1948 (and possibly 1960) (Squires, 1976).

The Cape d'Or Nova Scotia hack was approximately 5 km (3 mi.) from the village of Advocate. Access was a little-used road to the Cape d'Or lighthouse. The hack cliff at Fundy was

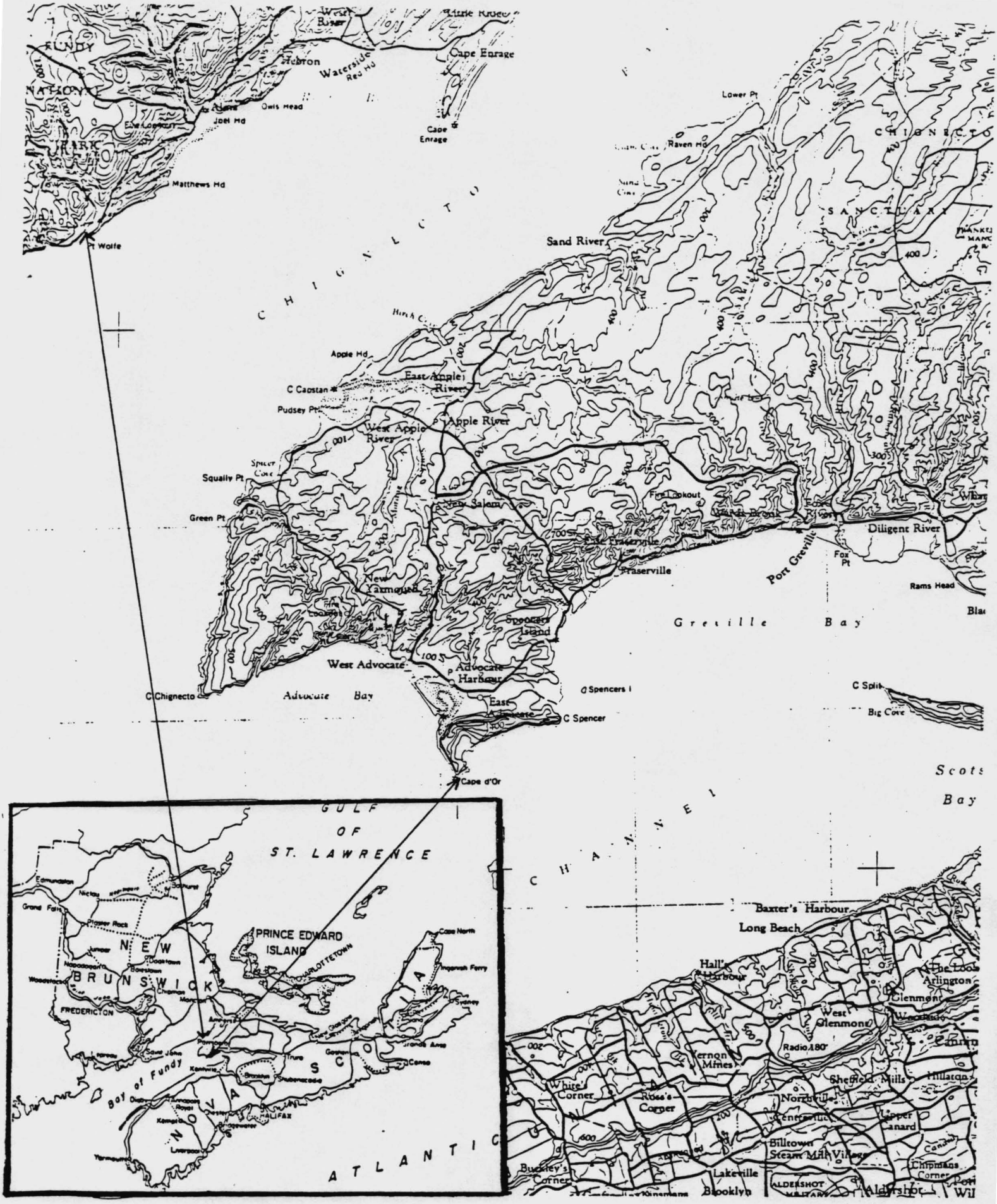

Figure 1. Locations of the 1984 peregrine release sites at Cape d'Or, Nova Scotia and Fundy National Park, New Brunswick.

relatively inaccessible, but the area across the Point Wolfe River estuary (observation point) was intensively used by Park visitors.

The Cape d'Or hack is on a 45 m (150 ft.) cliff and faces the Minas Channel in a generally southeast direction. The observation point was approximately 100 m (330 ft.) from the hack and was screened from the peregrines by a blind. The hack site in Fundy National Park is on the 75 m (250 ft.) cliff of the Point Wolfe River estuary and faces in a westerly direction.

Five habitats that provided potential hunting areas for peregrines were selected for the preliminary prey surveys. The five habitats are described as follows:

(1) woodland road - a gravel road passing through a section of woodland. The road passes through mixed coniferous-deciduous forest with alder growth on the road edges.

(2) field edge - the edge between old field and coniferous-deciduous mixed forest.

(3) harbour - at low tide the harbour consists of a mud-flat with several streams running through it. At high tide the harbour is completely filled with water.

(4) pebble beach - an area of sand and pebbles, including the intertidal area.

(5) marsh - an area of low wetland in which there is often standing water. Cattails and bulrushes are common plants.

Acknowledgements

The hack at Cape d'Or was attended by students Reg Newell and Colman Spence.

The release in Fundy National Park was carried out by Parks Canada staff and a separate report was prepared by them.

Methods

A double release was carried out at Cape d'Or and at Fundy National Park in 1984. Four birds were released from the hack boxes at each site, and about one week later four additional birds were placed in each box.

Release methods used at Cape d'Or and at Fundy National Park were similar to those used in previous years with some modifications made necessary by the double release. Detailed descriptions of the hack box and release site selection are included in the 1982 progress report (Bateman, 1982). Peregrines released at Fundy National Park in 1984 were fitted with temporary radio transmittors.

Peregrine prey counts

Five habitats were selected for preliminary prey counts during June; woodland, field edge, harbour, pebble beach, and marsh. Because this was the first time such counts were made, it was anticipated that modifications would be required in future years. Two count stations were selected in each habitat (Figure 2). At each station, all birds visible during a 20 minute period were counted. Counts at the harbour and pebble beaches were conducted at least two hours prior to high tide or no later than two hours after high tide because numbers of prey species in those areas depend on tide levels.

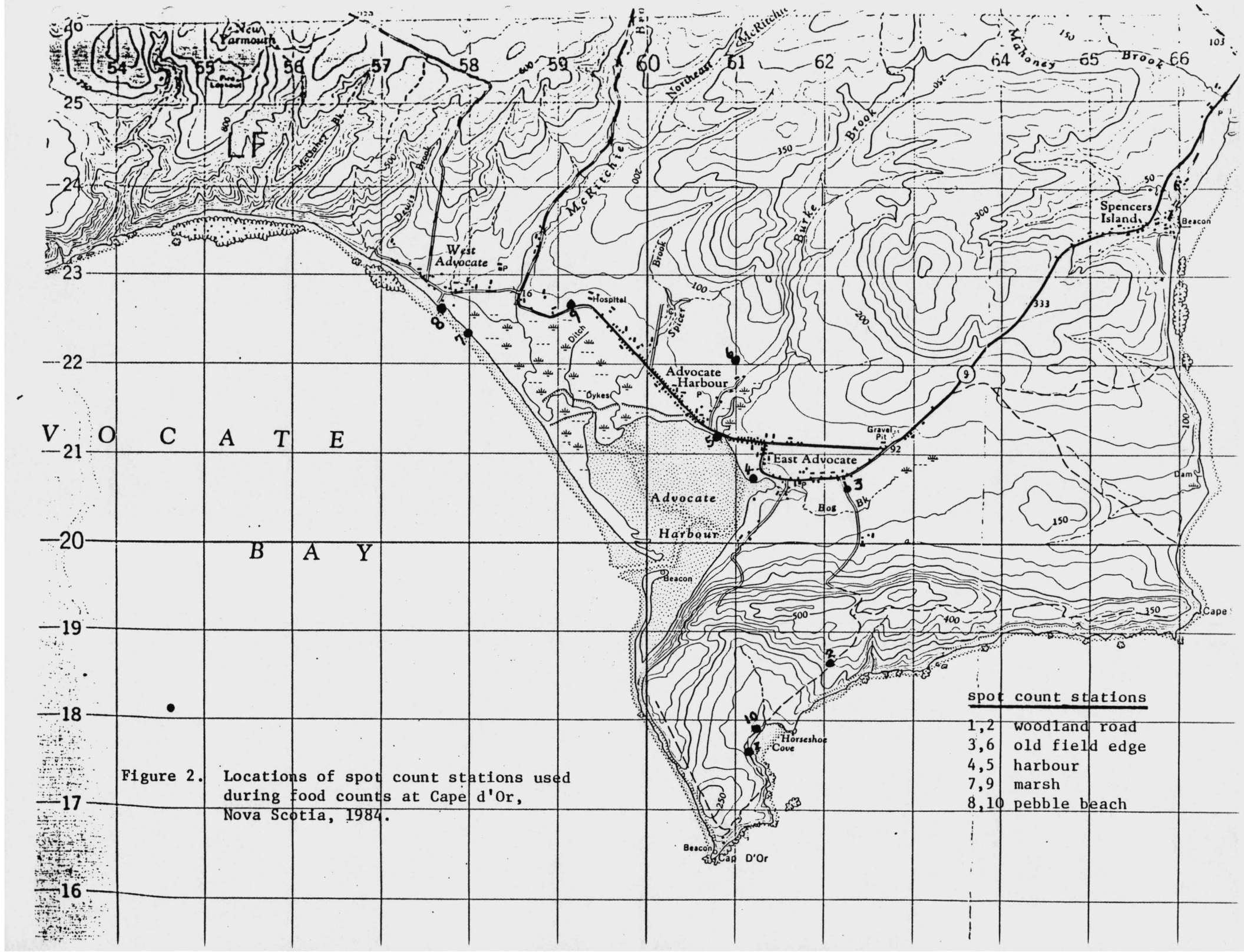

Figure 2. Locations of spot count stations used during food counts at Cape d'Or, Nova Scotia, 1984.

Pre-release care of peregrines

Peregrines for the first hack were kept in the shipping crate for two days prior to placing in the hack box to be sure they could feed themselves. The second group of peregrines were placed in the hack the day after they arrived. The peregrines in the hack box were fed by dropping whole chickens through a food chute. The chickens were partly skinned before they were fed to the peregrines. A commercial vitamin preparation, Vitamiacin, was sprinkled on the chicken on alternate days. Weights of the food chickens were between 500 g and 1.25 kg. The amount fed depended on the amount of food which remained from the previous day but was usually one-two chickens per bird per day.

The peregrines were observed from the observation point using binoculars and a 20-45 power spotting scope for at least two hours each day. Data sheets were used to record behaviour of the peregrines and amount of food placed in the hack each day.

Release of peregrines

Release days for the hacked peregrines were selected after considering age of the birds (between 42 and 50 days) and weather conditions (clear, little wind and no precipitation).

On release day, the birds were frightened into the hide at the back of the hack box and the door put in place. The protective wire was removed from the box and two dowels taken out of the side facing the cliff ledge. Chicken was placed in

the box and on the ledge. After the birds were allowed to settle for about 20 minutes, the door to the hide was quietly opened.

Release procedures were changed slightly from previous years to reduce the chances of "bolting" which had sometimes occurred. The birds were not fed for two days prior to release in 1984 instead of one day, and the dowels were removed from the side of the box facing the ledge instead of the cliff edge.

Post-release care of peregrines

Food was placed on the cliff edge next to the hack box for the first few days after release of the first peregrines. The food was then placed on the cliff edge about 15 m (50 ft.) from the hack box (tree site). After release of the second peregrines, food was placed at both the hack box and the tree site.

Daily observation periods were not fixed but varied in length and time depending on the behaviour of the peregrines. To prevent the birds from associating humans with food, chicken was not put out if the peregrines were nearby.

An attempt was made to identify each peregrine observed by reading the band number with the spotting scope. Records were kept of observed behaviour and feeding activity (Appendix I).

Results and Discussion

Eight peregrines arrived from the Canadian Wildlife Service breeding facility at Wainwright, Alberta on June 19 (Table 1). Four of the birds were taken to Fundy National Park by Parks Canada staff and four were taken to Cape d'Or. The four youngest birds (Cape d'Or) were fed in the shipping box to determine if they could feed by themselves, before they were placed in the hack box on June 22.

Table 1. Band number, sex, and ages of peregrines released at Cape d'Or, Nova Scotia and Fundy National Park, New Brunswick in the first releases, 1984.

	Band Nos.	Sex	Age at arrival (days)	Age at release (days) July 3	July 5
Cape d'Or					
987-28707	8A9	F	29		45
686-02433	8N3	M	28		44
686-02434	8N4	M	27		43
686-02435	8N5	M	25		41
Fundy					
686-02431	8N2	M	31	45	
987-28712	8A6	F	29	43	
987-28705	8A7	F	29	43	
987-28706	8A8	F	29	43	

The Cape d'Or birds were released on July 5 at 1030 hr. All four birds remained on the cliff edge feeding and wing-flapping until 1830 hr when observations were terminated. The next day, July 6, all birds were still on the cliff in the morning and at least three were still there at 1840 hr.

(Appendix I) when the observers left. On July 7 all peregrines were gone at 1000 hr. but all returned to feed at the hack between 1700 and 1800 hr.

Chicken was placed at the second feeding site (tree site) on July 11. The tree site was used for feeding to reduce the possibility of aggressive interactions between the two groups of peregrines when the later birds were released. The older birds began feeding at the tree site about 15 m (50 ft.) from the hack, with no difficulty.

The second group of eight peregrines arrived from Wainwright on July 10. Four of the birds were taken to Fundy National Park for release and four were taken to Cape d'Or (Table 2).

Table 2. Band numbers, sex, and ages of peregrines released at Cape d'Or, Nova Scotia and Fundy National Park, New Brunswick in the second releases, 1984.

	Band Nos.	Sex	Age at arrival (days)	Age at release (days) July 20	July 21
Cape d'Or					
686-04377	0P0	M	34	44	
987-28730	2B7	F	34	44	
987-28731	2B8	F	32	42	
987-28732	2B9	F	32	42	
Fundy					
987-28733	3B0	F	31		42
987-28734	0P1	M	31		42
686-04378	0P2	M	31		42
686-04379	0P3	M	31		42

There was no interaction observed between the peregrines from the first release which occasionally landed at the hack box and the younger birds in the box.

The second group of peregrines was released July 20 at 1100 hr. One peregrine flew after only a slight hesitation, the other three birds did not fly on release day or the next day, July 21. Two of the remaining birds flew apparently for the first time on July 22; the third had flown from the hack by the morning of July 23.

Birds from both releases fed at both feeding sites with little interaction and no serious aggression. Aerial interaction was observed between peregrines from the first and second releases but was not more serious than that between birds of a similar age.

All eight birds released at Cape d'Or were identified at the feeding sites for at least 21 days after release (Appendix I). The last sighting of a peregrine feeding at the release site was August 19. Feeding was discontinued on August 23.

Radio transmittors attached to the legs of the peregrines released in Fundy National Park permitted identification of the birds returning to feed (see progress report prepared by Parks Canada staff for details). One dead bird from the first release (colour band 8A6) was found using the transmitted signal. That bird was last identified in flight on July 17. The other seven birds released at the Fundy National Park site were successfully hacked; that is, they survived the first three weeks and apparently learned to hunt.

Peregrine prey counts

The most numerous species of appropriate size for peregrine prey were Red-winged Blackbird and Bobolink (Table 3). Those species were, of course, most frequently recorded in the marsh habitat (Table 4). Because counts were conducted during June, the midsummer influx of shorebirds in the harbour was not recorded. Shorebirds are probably an important food source for the hacked birds, which have been observed hunting in Advocate Harbour, as well as being potential food for any breeding peregrines in the area. In future years counts will be conducted over a longer period of time and number counted will provide a useful index of prey available to peregrines.

Table 3. The total number of individuals of each species observed on each day during food counts at Cape d'Or, Nova Scotia in 1984.

Species	Dates Observed June 8	9	10	16	17	18	19
unknown (warbler size)	8	21	18	4	13	30	-
American Redstart	3	1	-	1	-	2	-
Northern Parula	2	-	-	-	-	-	-
unknown flycatchers	3	2	-	-	-	-	-
Robin	10	8	11	2	2	2	-
unknown	10	-	-	-	-	-	-
Swallows (barn, tree, etc.)	62	50	80	64	18	25	31
Common Raven	3	1	2	1	8	1	1
Great Blue Heron	1	-	-	-	-	-	-
Black-backed Gull	5	1	2	7	3	-	2
Herring Gull	31	48	21	108	24	47	42
Common Crow	1	4	-	-	1	9	1
D.C. Cormorant	1	2	-	-	-	-	-
Sparrows (i.e. song & savannah)	2	4	4	3	9	6	9
Red-winged Blackbird	8	15	16	12	16	16	8
Bobolink	11	25	15	10	23	5	7
Northern Harrier	1	-	1	-	1	1	-
Black Duck	1	-	-	-	-	-	-
Common Scoter	2	-	-	-	-	-	
Kingbird	-	-	1	-	-	-	-
unknown (Robin size)	-	5	-	4	1	4	4
Killdeer	-	2	1	-	2	-	-
unknown duck	-	1	-	-	-	-	-
Spotted Sandpiper	-	1	-	-	1	-	-
Black Guillemot	-	1	-	-	-	-	
Common Snipe	-	1	-	-	-	-	
unknown Sandpiper	-	-	1	-	-	-	-
Goldfinch	-	-	1	1	-	-	-
Common Grackle		-	1	-	-	-	
Cedar Waxwing	-	-	-	2	-	-	
unknown (sparrow size)	-	-	-	16	18	6	2
Red-tailed Hawk	-	-	-	1	1	-	-
Gray Jay	-	-	-	-	-	-	1
Starling	-	-	-	-	-	-	4
Common Eider	-	-	-	-	-	-	1
Total	165	193	175	236	141	154	113

Table 4. The total number of individuals of each species observed at each station during food counts at Cape d'Or, Nova Scotia in 1984.

	Station*									
	1	2	3	4	5	6	7	8	9	10
unknown (Warbler size)	58	31	1	-	-	-	-	4	3	1
Great Black-backed Gull	1	-	2	5	8	1	1	2	-	4
unknown Flycatchers	5	-	-	-	-	-	-	-	-	-
Swallows (barn, tree, etc.)	11	-	61	63	96	21	25	18	29	6
American Redstart	6	1	-	-	-	-	-	-	-	
unknown (Robin size)	1	1	7	1	-	1	4	-	2	1
Common Crow	1	-	2	6	-	4	1	-	3	-
Herring Gull	1	1	7	136	145	1	4	23	1	3
Northern Parula	2	-	-	-	-	-	-	-	-	
Robin	-	2	19	-	-	-	-	-	14	-
Red-tailed Hawk	2	-	-	-	-	-	-	-	-	
unknown	-	1	4	-	-	-	2	-	3	-
Sparrow (Song, Savannah, etc.)	-	-	6	2	-	8	8	6	-	-
Northern Harrier	-	-	2	-	-	1	-	-	2	-
Bobolink	-	-	1	-	-	-	22	3	71	-
Killdeer	-	-	2	1	1	-	1	-	-	-
Common Raven	-	-	4	4	1	-	3	3	1	1
Cedar Waxwing	-	-	2	-	-	-	-	-	-	
unknown (Sparrow size)	-	-	3	-	-	1	27	6	7	
Great Blue Heron	-	-	1	-	-	-	-	-	-	
D.C. Cormorant	-	-	-	1	-	-	-	2	-	-
Starling	-	-	-	-	4	-	-	-	-	
Gray Jay	-	-	-	-	-	1	-	-	-	-
Red-winged Blackbird	-	-	-	-	-	-	76	-	15	-
unknown Sandpipers	-	-	-	-	-	-	1	-	-	
American Goldfinch	-	-	-	-	-	-	1	-	2	-
Spotted Sandpiper	-	-	-	-	-	-	2	1	-	-
unknown Duck	-	-	-	-	-	-	1		-	-
Black Duck	-	-	-	-	-	-	-	-	1	-
Eastern Kingbird	-	-	-	-	-	-	-	-	1	-
Common Eider	-	-	-	-	-	-	-	-	-	1
Common Scoter	-	-	-	-	-	-	-	-	-	1
Common Grackle	-	-	-	-	-	-	-	-	1	-
Common Snipe	-	-	-	-	-	-	-	-	1	-
Black Guillemot	-	-	-	-	-	-	-	1	-	-
Total	88	37	124	219	255	39	179	69	157	18

*Stations 1,2 woodland road
3,6 field edge
4,5 harbour
7,9 marsh
8,10 pebble beach

Conclusions and Recommendations

Fifteen of the sixteen peregrines released in the Upper Bay of Fundy in 1984 were successfully hacked.

Radio-telementry was an adequate means of determining the success of the peregrines released at Fundy National Park.

It is recommended that additional releases be carried out in the Upper Bay of Fundy at the same release sites in 1985.

Surveys of potential nest ledges, with emphasis on historical peregrine nest sites, should be carried out in 1985.

Indices of peregrine food abundance should be determined by more counts in future years. The counts should be continued June 1 through August 15. Preliminary counts in 1984 indicated that the technique has potential usefulness.

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Appendix I. Highlights of the chronology of release and departure and notes on behaviour of peregrines before and after release at Cape d'Or, Nova Scotia and Fundy National Park, New Brunswick in 1984.

(Daily notes are available upon request)

1984

June 19	First eight peregrines arrived at Moncton Airport from Wainwright, Alberta. Four of the birds were destined for Fundy National Park and four for Cape d'Or.
June 22	The Cape d'Or peregrines placed in the hack box.
June 29	First day that wing-flapping was observed. The birds were between 25 and 29 days old.
(July 3*	Fundy birds were released.)
July 5	Cape d'Or birds were released. All four birds remained on the cliff.
July 6	Four birds on the cliff in the morning. Three (possibly four) birds still had not flown by 1830 hrs.
July 7	All peregrines were gone at 1000 hr. and returned to feed between 1700 and 1800 hr.
July 10	Second group of eight birds arrived from Wainwright, Alberta. Four were taken to Fundy National Park and four to Cape d'Or.
July 11	Chicken was placed at the tree feeding site for the older birds.
July 12	First day that wing-flapping by the young birds was observed.
July 20	Young birds were released at 1100 hr. One flew after a slight hesitation. One older bird fed with the young birds with no sign of aggression.
(July 21*	The young birds at Fundy National Park were released.)
July 22	All four peregrines from the first release were still in the area. Two birds from the second release were observed flying.
July 23	The fourth peregrine from the second release had flown by morning.
July 26	Peregrines from the first release had been flying for three weeks. All four birds were observed near the hack box.

August 1	The last sightings of 8A9 and 8N3 at the hack box.
August 10	Peregrines from the second release had been flying for three weeks.
August 12	The last sighting of peregrine 2B8 at the hack.
August 13	The last sighting of 2B7 at the hack.
August 15	The last sighting of 0P0 in the hack area.
August 16	The last sighting of 2B9 in the hack area.
August 19	The last sighting of 8N5 and 8N4.
August 23	The last day that food was placed at the hack and at the tree feeding sites.

*Comments refer to Cape d'Or birds unless it is specifically stated that Fundy birds are described.