

# Killer whales (*Orcinus orca*) in waters off Newfoundland and Labrador, 1978–1986

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## ABSTRACT

In 1979 a cetacean sighting network using land-based and shipboard observations was established throughout Newfoundland and Labrador to monitor whale distribution. From 1979–1986 over 50,000 naut. miles in shipboard effort and 3,100 weeks of land-based observer effort have been expended to document marine mammal distribution, abundance and conflict with fisheries. Sixty two sightings and two strandings of killer whales (*Orcinus orca*) were recorded. Most sightings occur in summer months, primarily due to observer effort. Winter occurrence in the area is known from some sightings and occasional entrapment in ice. The infrequency of sightings suggests the population is small. It is speculated that past conflicts with whalers and fishermen may have suppressed populations and/or retarded their growth.

## INTRODUCTION

Little systematic work has been done on killer whales (*Orcinus orca*) in Newfoundland and Labrador waters. Some observations of killer whales is evidenced in maritime archaic settlements on the Northern peninsula of Newfoundland: killer whale models and burial site carvings have been found, indicating economic or cultural value of this species some 4,000 years ago. Tuck (1976) speculated that a cult existed which venerated the killer whale and imitated it in hunting. Observation of the occurrence and behaviour of this whale in coastal Labrador by the Inuit of the Thule tradition (A. D. 1500 to present) also has been documented (Brice-Bennet 1977). In Inuit folklore the often recounted tale of the thrasher and swordfish (Perkins and Whitehead 1983) apparently involves the male killer whale as the thrasher and the female as

the swordfish. During the period 1880–1890, James P. Howly collected several stranded killer whales for the Newfoundland Museum (Howly 1887). Howly's collection was lost in a fire in the mid-1930s (J. E. Maunder, pers. comm.).

Accounts of early Basque whaling off the Labrador coast mention the species but only in passing (Shortis undated; Fudge 1973). Early twentieth century accounts largely ignore killer whales while noting other species, even some not then commercially valuable (Prowse 1895; Millais 1907). Modern whalers in general intensely disliked killer whales because of their habit of eating captured baleen whales, but admired their perceived prowess and intelligence (Laracy 1973; Fudge 1973; Reeves and Mitchell 1988a – this volume).

On occasion killer whales themselves were hunted and taken by whalers (Sergeant 1953;

Reeves and Mitchell 1988b – this volume) often precipitating altruistic displays within the pod, tales of which have become well-established in Newfoundland folklore (E. Bugge, pers. comm.). At present inshore fishermen, especially in Labrador, fear killer whales when they come near their boats (Lien *et al.* 1984; Brice-Bennet 1977).

General accounts of killer whales in Newfoundland and Labrador waters during the twentieth century, with comments on occurrence and movements of the species, may be found in Sergeant and Fisher (1957), Mitchell (1975), Sergeant (1961), Sergeant (1970), Leatherwood and Dalheim (1978), Leatherwood *et al.* (1976), Steiner *et al.* (1979), Katona *et al.* (1983), Lien *et al.* (1984), Lynch (1987), Mitchell and Reeves (1988 – this volume) and Reeves and Mitchell (1988b – this volume). Ice entrapments (W. Kettle, pers. comm.; Dearden 1958) suggest that the species occurs in the area year-round. All authors conclude from sightings that the species is infrequent, perhaps rare, in Newfoundland and Labrador waters but provide little additional information.

This paper summarizes sightings and strandings of killer whales in Newfoundland and Labrador waters during the period 1976–1986 and discusses implications of all available information to the species' distribution, movements, abundance and conflicts with fisheries in these waters.

#### METHODS

Occasional reports of killer whales were made to the Department of Fisheries and Oceans from 1976–1979, but there was no systematic sighting effort. Sightings from cruises during 1976–1979 were compiled by Lynch (1987). In 1979 a cetacean sighting network was organized throughout Newfoundland and Labrador (Lien *et al.* 1979). Sightings data came from two sources, land-based whale observers and observers on marine vessels. All of these volunteer observers were given training in identification of whales, provided with guidebooks and reporting instructions and

tested for reliability of their identifications. The test required observers to determine species of cetaceans in a set of black and white photographs. Expert observers (N = 19) who took this test scored 91% correct; volunteer observers (N = 134) scored 65% correct on all species. Correct identifications were extremely high for killer whales for both expert and volunteer observers (expert 100%; volunteer 90%). Errors by volunteer observers were all of the kind where killer whales were identified as "probably killer whales." No other species were identified as killer whales.

Land-based observers recorded from 120 locations around the province. Many observers were Canadian Coast Guard lighthouse keepers who reported sightings from the same location year after year. Land-based observers did not search for whales on any regular schedules. Rather, they logged, weekly, sightings of whales they made or that were reported to them in the course of their work. Table 1 presents efforts of land-based observers by year and Figure 1 shows the effort of land-based observers throughout the province.

Opportunistic use of coastal vessels on routine inshore routes on which we could place dedicated observers also provided year after year observations of the same waters during the same seasons (Table 2).

A total of 52,037 naut. miles of shipboard

TABLE 1  
*Observer effort in the Newfoundland and Labrador cetacean sighting network (1976–1986).*

Year	Land-based observer weeks	Shipboard effort (in naut. miles)
1976	—	1,509
1977	—	2,926
1978	—	1,558
1979	498	10,778
1980	608	8,728
1981	490	8,325
1982	392	6,818
1983	285	1,954
1984	276	3,659
1985	297	4,020
1986	280	1,762



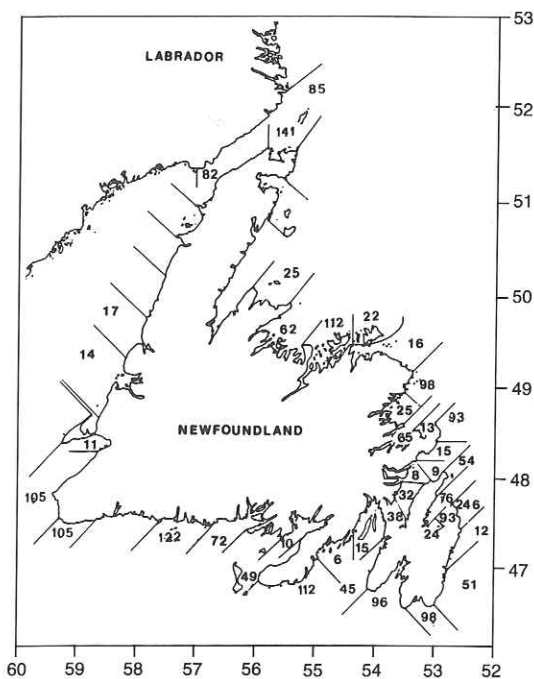


Fig. 1. Land-based cetacean observer effort in man weeks (1979–1986).

observation and 3,126 weeks of land-based observation effort was spent from 1976–1986. There was greater observer effort in the eastern area of Newfoundland than in other parts of the province and greater effort in summer months than in winter. One hundred percent of shipboard effort occurred from April–September; 68% of the land-based observer effort also occurred during these summer months. Only 710 weeks of observer effort occurred along the entire coast of Labrador. A complete description of the Newfoundland observer network is presented in Lynch (1987).

In 1979 a province-wide, toll-free phone system was established for reporting cetaceans including killer whales stranded or incidentally caught in fishing gear (Lien *et al.* 1985).

## RESULTS

Sixty two killer whale sightings (2–14/year) were reported from 1976–1986 (Table 3). Sixty two percent of the sightings were by land-based observers, 38% by shipboard ob-

servers. Some of the shipboard sightings from 1976 were unsolicited reports submitted to the Department of Fisheries and Oceans; those after 1979 were responses to the organized sighting network begun in 1979. The highest number of sightings (12–14/year) was reported in 1979–1980. All sightings are listed in Appendix 1 and their geographic location are shown for the Newfoundland area in Figure 2 and for Labrador waters in Figure 3.

Land-based observers had a weekly sightings rate of only 0.01 killer whales, compared to 0.34 humpback (*Megaptera novaeangliae*), 0.22 minke (*Balaenoptera acutorostrata*) and 0.32 pilot (*Globicephala melaena*) whales. Sightings of killer whales by shipboard observers varied greatly, from 0.0013/naut. mile in 1983 to nil in 1984. Mean sightings rate per naut. mile cruised by shipboard observers from 1979–1986 was 0.0004/naut. mile.

Sightings were made in most areas where substantial observer effort was expended. On the Grand Banks sightings of killer whales were made on the southeast and eastern shoals. In Newfoundland most sightings were reported from waters off Port aux Basques,

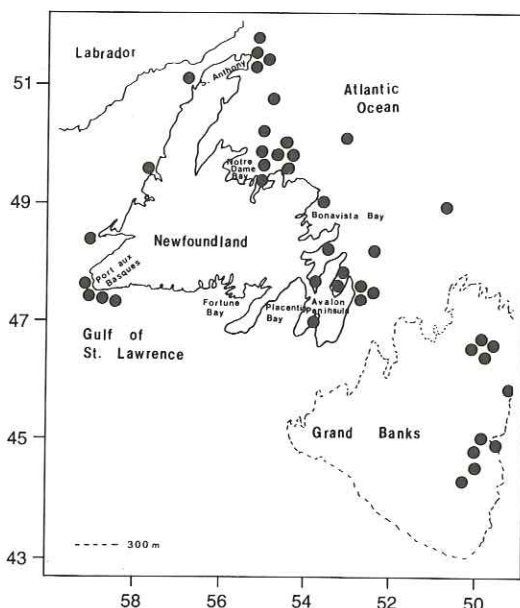


Fig. 2. Location of killer whales (*Orcinus orca*) sightings near Newfoundland, 1977–1986.

off the eastern Avalon Peninsula near Twillingate in Notre Dame Bay and off St. Anthony (Fig. 2.) Killer whales were sighted in Labrador waters off Cape Charles, off Cape Harrison and southeast of Nain (Fig. 3).

Most sightings were made during the summer months of June (21%), July (19%) and

August (38%). A few sightings occurred in spring, from March–May (10%), and in fall from September–November (12%). No sightings were made during winter months (Fig. 4).

Only two stranded killer whales were reported, one in 1982 and another in 1983 (Appendix 1). One stranded alive but later died;

TABLE 2  
Cruises on which cetacean observation were conducted, 1976–1986

Year	Vessel (Observer)	Nautical miles travelled	Year	Vessel (Observer)	Nautical miles travelled	Year	Vessel (Observer)	Nautical miles travelled
1976	Regina Maris .	347	1980	Rich Point . . .	820	1981	Gadus . . . . .	1.248
1976	Patience . . . . .	926	1980	Hakada . . . . .	135	1981	Mer d'Alors .	295
1976	Wm. Carson . .	236	1980	Elsie G . . . . .	992	1982	Findrinny . . .	3.532
1977	Regina Maris .	2.926	1980	(Davidson) . . .	237	1982	(Baird) . . . . .	97
1978	Firenze . . . . .	1.558	1980	(Baird) . . . . .	279	1982	(Macduff) . . .	377
1979	Firenze . . . . .	1.544	1980	(Fitzgerald) . . .	415	1982	(Peters) . . . . .	465
1979	Westward . . . .	1.493	1980	Polynya . . . . .	114	1982	Dawson . . . . .	421
1979	Petite Forte . .	994	1980	(Pauley) . . . . .	83	1982	(Linegar) . . .	544
1979	Bonavista . . . .	2.019	1980	Kelly B . . . . .	172	1982	Marangai . . .	183
1979	North'n Seal . .	2.173	1980	Maid of Mourne	241	1982	Rich Point . . .	1.011
1979	Rich Point . . .	1.567	1980	Ambrose shea .	40	1982	(Richards) . . .	10
1979	(Halliday) . . .	239	1980	Aardvark . . . . .	816	1982	(Richards) . . .	58
1979	Strongbow . . . .	179	1980	(Mahle) . . . . .	65	1982	Firanje . . . . .	120
1979	(Spracklin) . . .	123	1980	Marinus . . . . .	107	1983	Findrinny . . .	1.954
1979	(Manuels) . . . .	110	1980	Firanje . . . . .	420	1984	Gadus . . . . .	1.504
1979	Whiteway . . . .	337	1981	Firanje . . . . .	726	1984	Topsail Star . .	2.155
1980	Hudson . . . . .	701	1981	Regina Maris . .	2.145	1985	Gadus . . . . .	1.090
1980	Gadus . . . . .	1.012	1981	Westward . . . .	1.661	1985	Topsail Star . .	2.930
1980	(Laurentius) . .	151	1981	Marangai . . . . .	376	1986	Gadus . . . . .	1.042
1980	Westward . . . .	1.043	1981	Rich Point . . . .	1.244	1986	Caribou . . . .	95
1980	Bonavista . . . .	885	1981	ONO-1 . . . . .	630	1986	Marine Packer	625

TABLE 3  
Sightings of killer whales (*Orcinus orca*) 1977–1986 and sightings/effort ratios for land-based and shipboard observers. \*Indicates effort information was not available.

Year	Total number of sightings	Total number of individuals	Ratio Land-based sightings/Land-based effort in weeks	Ratio Shipboard sightings/shipboard effort in naut. miles
1977 . . . . .	2	10	*	*
1978 . . . . .	2	1+	*	*
1979 . . . . .	14	73–77	0.0281	0.00074
1980 . . . . .	12	22	0.0197	0.00034
1981 . . . . .	6	22+	0.0122	0.00012
1982 . . . . .	2	14–20	0.0051	0.00014
1983 . . . . .	7	46–60	0.0245	0.00135
1984 . . . . .	4	18–20	0.0144	0.00000
1985 . . . . .	5	28–70	0.0168	0.00033
1986 . . . . .	8	25–65	0.0285	0.00070



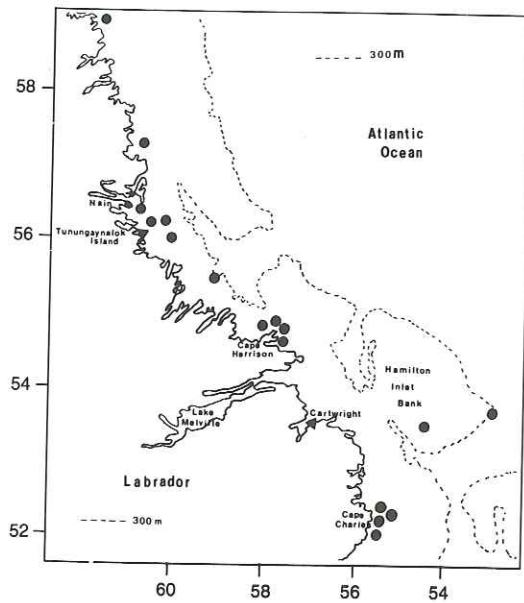


Fig. 3. Location of killer whale (*Orcinus orca*) sightings off Labrador, 1977–1986.

the second was killed in an ice entrapment. An examination of the testes for sperm indicated that the 4.75 m male was immature but the 6.5 m male was mature. Both had empty stomachs.

#### DISCUSSION

The relatively lower rates of sightings of killer whales than of humpback, minke, and pilot whales in Newfoundland and Labrador suggest a small population in these waters. This is consistent with Brice-Bennet (1978), who reports that only 10% of cetacean sightings in the Labrador Sea are of killer whales. No estimate of size of the Newfoundland and Labrador population is possible.

Frequency of sightings in a given area seem explainable primarily by observer effort. In locations where observers looked, a few killer whale sightings were typical. The high number of summer sightings (78%) reflects observer effort during summer months (82%).

It is not clear what factors limit the numbers of the killer whales in Newfoundland and Lab-

rador waters. Although killer whales were rarely a target of whaling, the practice of shooting those that came to feed on captured baleen whales may have significantly diminished the population in these waters. Whaling ceased in Newfoundland waters in 1972. At present killer whales are not taken in inshore fishing gear and are not known to be shot or hunted.

Although there was comparatively little effort and few sightings for winter months (October–March), occasional sightings and ice entrapments (Dearden 1958; Mitchell 1980) suggest that killer whales do occur here in winter. The apparent geographical clustering of some sightings may suggest existence of “resident” pods (Bigg 1982; Ford and Fisher 1983; Bigg *et al.* 1986), but such clustering probably is best explained by observer effort.

Examination of stomachs from the few stranded animals and distribution of sightings relative to distribution of potential prey have not provided clues as to the food of killer whales in Newfoundland and Labrador waters. Steiner *et al.* (1979) suggest that killer whales they observed off St. John’s were feeding on herring (*Clupea harengus*). Observations of killer whales feeding on beluga (*Del-*

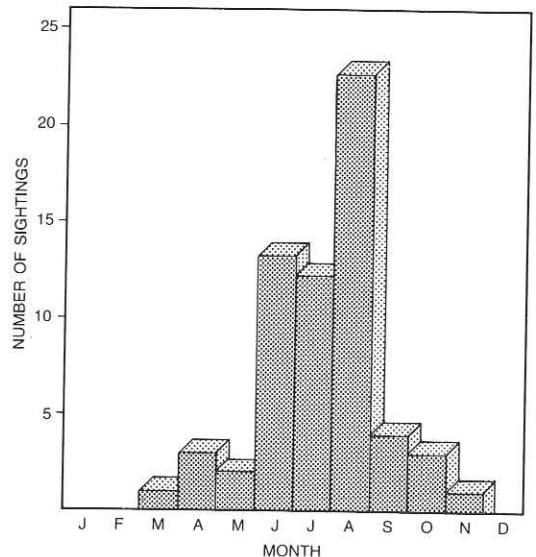


Fig. 4. Killer whale sightings by month, 1976–1986.

*phinapterus leucas*) and seals of several species off Labrador have also been noted (Brice-Bennet 1977).

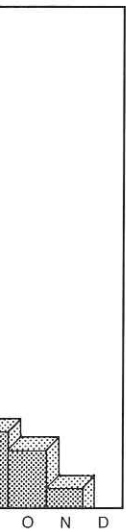
Continued monitoring of killer whales in Newfoundland and Labrador waters by the provincial sighting network is planned. A preliminary catalogue of photographs will be added with the goal of photoidentifying individuals in these areas.

#### ACKNOWLEDGEMENTS

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## APPENDIX 1

*Killer whale (Orcinus orca) sightings and strandings in Newfoundland and Labrador, 1977-1986. In identifying the number of animals sighted: M = Male; F = Female; C = Calf; Y = Young; U = Unknown. If no better designation is given with the number of animals, then the sightings report did not specify age/sex class.*

Date	Latitude-Longitude	Location	Number of animals
7 July 1977	49°29'N 53°19'W	Bay of Exploits	Undetermined
13 July 1977	51°57'N 55°00'W	30 naut. miles East of Belle Isle	1M, 2, 6U = 9
Summer 1978	47°10'N 53°35'W	Harricot, St. Mary's Bay	Undetermined
21 August 1978	56°30'N 61°40'W	Nain, Labrador	Undetermined
21 June 1979	46°26'N 50°48'W	Grand Bank	9 or 10
21 June 1979	46°26'N 50°48'W	Grand Bank	4 or 5
21 June 1979	46°26'N 50°48'W	Grand Bank	1 or 2
28 June 1979	46°26'N 50°48'W	Grand Bank	
24 July 1979	55°30'N 57°57'W	~75 naut. miles East of Hopedale, Labrador	
2 August 1979	54°50'N 57°51'W	Cape Harrison, Labrador	4 or 5
5 August 1979	47°35'N 53°35'W	Dildo Arm, Trinity Bay	1M, 2, 1Y = 4
11 August 1979	43°58'N 50°01'W	Grand Bank	
13 August 1979	59°00'N 60°05'W	~90 naut. miles East of Gulch Cape Labrador	
17 August 1979	56°00'N 58°25'W	~60 naut. miles East of Dan's Inlet, Labrador	Sub groups of 11, 5, 4 = 20
17 August 1979	54°55'N 57°55'W	Cape Harrison, Labrador	
20 August 1979	48°15'N 53°20'W	Bonaventure Head, Trinity Bay	5U, 1F, 1Y = 7
26 October 1979	50°18'N 54°33'W	~25 naut. miles North of Twillingate Is., Bay of Exploits	
26 October 1979	50°18'N 54°28'W	~25 naut. miles North of Twillingate Is., Bay of Exploits	1M, 3 = 4
11 April 1980	49°45'N 54°45'W	Off Twillingate, Bay of Exploits	2
20 April 1980	50°05'N 55°30'W	~10 naut. miles NE of Gull Is., Notre Dame Bay	2
16 May 1980	48°10'N 52°32'W	~12 naut. miles E of Baccalieu Is.	2
5 June 1980	49°05'N 57°55'W	Bonne Bay	1
12 June 1980	48°25'N 59°10'W	Cape St. George	1
21 July 1980	47°23'N 53°07'W	Holyrood, Conception Bay	1
5 August 1980	54°55'N 57°55'W	Cape Harrison, Labrador	1
20 August 1980	49°45'N 55°15'W	Off Funk Island	1

## Appendix 1 (continued)

Date	Latitude-Longitude	Location	Number of animals
22 August 1980	56°20'N 59°54'W	~30 naut. miles E of Tunungayualok Is., Labrador . . .	3
23 August 1980	56°22'N 59°55'W	~30 naut. miles E of Tunungayualok Is., Labrador . . .	2
17 October 1980	47°25'N 52°45'W	Petty Harbour, Motion Bay . . . . .	4
26 November 1980	53°01'N 52°39'W	~90 naut. miles E of Hawke Is., Labrador . . . . .	2
26 November 1980	53°01'N 52°39'W	~90 naut. miles E of Hawke Is., Labrador . . . . .	2
1 June 1981	51°40'N 55°25'W	Cape Bauld . . . . .	4
8 July 1981	51°08'N 57°28'W	~20 naut. miles W of Ferolle Point . . . . .	4
21 July 1981	51°40'N 55°25'W	Cape Bauld . . . . .	4
23 July 1981	47°35'N 53°05'W	Kelly's Is., Conception Bay . . . . .	"Small group"
26 July 1981	44°37'N 50°02'W	Southeast Shoal, Grand Bank . . . . .	1M, 4U = 5
28 July 1981	51°40'N 55°25'W	Cape Bauld . . . . .	
12 June 1982	47°37'N 59°15'W	Cape Ray . . . . .	6-8
4 July 1982	44°28'N 50°04'W	Southeast Shoal, Grand Bank . . . . .	3M, 7 to 9 = 10 to 12
2 September 1982	47°06'N 52°55'W	Admirals Cove . . . . .	Stranding of 1 individual
30 March 1983	47°35'N 52°55'W	Topsail, Conception Bay . . . . .	Ice stranding 1 individual
12 June 1983	45°39'N 48°25'W	Grand Bank . . . . .	
25 June 1983	44°49'N 50°10'W	Grand Bank . . . . .	~3M, 2Y, ~12 = ~ 17
26 June 1983	44°49'N 50°10'W	Grand Bank . . . . .	~3M, 2Y, ~12 = ~ 17
26 July 1983	61°57'N 71°40'W	Hudson Strait . . . . .	1M = 1
3 August 1983	51°48'N 55°22'W	Strait of Belle Isle . . . . .	Undetermined
24 August 1983	57°30'N 62°10'W	Okak Bay, Labrador . . . . .	6 to 20
19 September 1983	49°30'N 55°00'W	Bay of Exploits . . . . .	1M, 1F, 2Y = 4
27 May 1984	49°03'N 53°33'W	Greenspond Is., Bonavista Bay . . . . .	
27 June 1984	49°40'N 54°45'W	Long Point-Twillingate Bay of Exploits . . . . .	
1 August 1984	49°30'N 55°00'W	Bay of Exploits . . . . .	2L, 5M, 3S = 10
26 August 1984	54°55'N 57°55'W	Cape Harrison, Labrador . . . . .	6 to 8
13 August 1985	47°31'N 59°07'W	Channel Head Port Aux Basques . . . . .	6 to 20
14 August 1985	47°32'N 59°07'W	Channel Head Port Aux Basques . . . . .	6 to 20
15 August 1985	47°32'N 59°07'W	Channel Head Port Aux Basques . . . . .	6 to 20
2 September 1985	48°48'N 49°38'W	~100 naut. miles E of Cape Bonavosta . . . . .	
5 September 1985	65°53'N 61°07'W	Davis Strait . . . . .	1L, 2S = 3
16 April 1986	53°34'N 52°10'W	~150 naut. miles E of Cartwright Labrador . . . . .	
18 June 1986	47°30'N 52°43'W	Cape Spear . . . . .	1 to 5
6 July 1986	47°30'N 52°43'W	Cape Spear . . . . .	1 to 5
1 August 1986	52°10'N 55°38'W	Camp Island, Labrador . . . . .	1 to 5
6 August 1986	52°10'N 55°38'W	Camp Island, Labrador . . . . .	6 to 20
13 August 1986	52°10'N 55°38'W	Camp Island, Labrador . . . . .	6 to 20
20 August 1986	50°58'N 54°53'W	~50 naut. miles E of Groals Island . . . . .	4
21 August 1986	53°34'N 55°30'W	50 naut. miles E of Cartwright Labrador . . . . .	4

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Labrador Prehis-  
Canada, National  
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In identifying the  
better designation  
class.

Number of animals

Undetermined

1M, 2, 6U = 9

Undetermined

9 or 10

4 or 5

1 or 2

4 or 5

1M, 2, 1Y = 4

Sub groups of

11, 5, 4 = 20

5U, 1F, 1Y = 7

1M, 3 = 4

2

2

2

1

1

1

1

1

1