

Whale Entrapments in Inshore Fishing Gear and a Summary of
the Entrapment Assistance Program in
Newfoundland and Labrador During 1990.

A Preliminary Report to the Fisheries Development Branch of the
Department of Fisheries and Oceans, and the Newfoundland and
Labrador Department of Fisheries

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Executive Summary

Assistance was provided to inshore fishermen in Newfoundland and Labrador who incidentally caught large whales and sharks. The animals were removed from the fishing gear quickly, and gear damage and animal mortality minimized.

Humpback whales are the most common problem species. This year a total of 75 animals were reported entrapped. Mortality of humpbacks caught in gear was higher than in previous years (N = 10; 13%) because a large number of entrapments occurred during a week when the capelin fishery was at its peak, and also some codtraps were not hauled regularly because of rough weather; 7 of 10 humpbacks died during this week.

The numbers of humpbacks caught this year represents a new record for one season; record number of entrapments have now occurred for three years in succession. The numbers of humpbacks reported caught in this period is greater than numbers entrapped during 1979-1980 when humpback abundance inshore was at its peak due to a collapse of capelin stocks.

Several research programs are under way to alleviate the number of collisions which occur including a large scale test of acoustical "alarm" devices which assist the whales in locating codtraps. Research has also begun to evaluate reasons for the increase in the humpback problem which has been evident over the past three years.

Three other large species of cetaceans were entrapped in fishing gear during 1990, including minke whales (N = 14), finbacks (N = 2) and a single northern bottlenose whale.

Entrapments of small cetaceans are also common in inshore fishing gear. Harbour porpoise have been recently classified as "threatened" by COSEWIC in our waters because of the extent of the fishery by-catch and the problem has been given priority status by the International Whaling Commission. Other species such as white-beaked dolphins, white-sided dolphins and beluga are also caught regularly. In the past these have been frequently reported to the Entrapment Assistance Program. This year a cooperative project investigated the extent of small cetacean by-catch and a long-term monitoring program was initiated by Memorial University, D.F.O., C.W.S. and the World Wildlife Fund.

Leatherback turtles and some sharks were also reported entrapped in fishing gear on occasion but numbers were not high. Incidental catches of seals were also reported to the Entrapment Assistance Program but these data are being systematically monitored by several other programs.

This was the eleventh year the Entrapment Assistance Program operated. During that period, mortality of humpbacks has been reduced from about 50% prior to the program, to an average of 9.4% for the past several years; cost of the program per reported entrapment has been about \$220. which has been estimated to save fishermen from \$250-1,100 per accident; there has not been a single accident or injury which has resulted from dealing with the 887 whale entrapments reported during the period; and most importantly, fishermen continue to value and cooperate with the program.

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Our greatest debt, and the most thanks must again go to the inshore fishermen of Newfoundland and Labrador. Their cooperation and help, often in a period of very hard work and disappointment, are truly remarkable. The Entrapment Assistance Program works because of their efforts and we are thankful to them for their cooperation.

Introduction

The Entrapment Assistance Program has operated since 1979 to assist the inshore fishermen of Newfoundland and Labrador with problem whales and sharks. Large whales and sharks collide with fishing gear and become entrapped; removing them quickly and safely is difficult for fisherman. The program is designed to minimize the gear and down-time losses which occur when these large animals collide and are entrapped by fishing gear, and to minimize unnecessary mortality to cetaceans due to entrapment. Results from the Entrapment Assistance Program in previous years have been summarized in annual reports. (Lien 1980; Lien and Aldrich 1982; Lien et al. 1982; Lien et al. 1983; Lien et al. 1984; Lien, Walter and Harvey-Clark 1985; Lien et al. 1986; Lien, Papineau and Dugan 1987; Lien, Ledwell and Nauen 1988; Lien, Ledwell and Huntington 1989b).

Methods

During 1990, the Entrapment Assistance Program operated using methods similar to those of previous years (Lien 1988). For the third year in succession, a trained crew of fishermen were hired specifically for dealing with entrapments.

Entrapment Assistance was widely advertised by a variety of publications and advertisements, through Fisheries and Oceans field offices and by Newfoundland and Labrador Department of

Fisheries field workers. A card advertising the program was mailed to all fishermen in one of the regular D.F.O. - Newfoundland Region mailings.

Fishermen could call a 24-hour toll-free phone service for advice and assistance. If assistance was requested, a crew was dispatched to help remove the entrapped animals as quickly as possible. During the busiest period of the summer a second crew was ready and responded to calls.

Calls were received which reported a variety of problems in addition to the entrapment of large whales and sharks, including marine mammal strandings, ice entrapments of cetaceans and entrapment of marine turtles and seals. Many fishermen also called or stopped by the Whale Research Group at M.U.N. for advice on building "alarms". As appropriate, fishermen were given information, access to tools or field assistance.

Results

Humpback Whales: Humpback whales (Megaptera novaengliae) remain the major problem species for inshore fishermen; 54% of entrapment reports involved this species. A listing of the dates, locations, means of entrapment and outcome of reported humpback entrapments is presented in Table 1. The location of these entrapments is shown in Figure 1.

There were a total of 75 humpback entrapments reported during 1990. All entrapments were made by fishermen except two which were reported through Canadian Coast Guard lighthouse keepers. Some entrapments undoubtedly were not reported, but the number of such incidents is low, and under-reporting probably would be about 10%.

Mortality of entrapped humpbacks was high this year (13%); 10 animals died as a result of entrapment. Seven of the ten deaths occurred during the week of 23-30 June. This was a period when the capelin fishery was at its peak in several areas; codtraps were in place prior to this time but were not always fished each day. Additionally, weather during this week was exceptionally bad and fishermen in several areas were not able to check traps each day.

Entrapment assistance was given successfully in 36% of the reported entrapments; animals were released alive and completely free of gear (29.3%) or released from the gear but had rope or net fragments that remained on the animal after release (6.7%). Self releases occurred in 33% of the reported entrapments, before human intervention or assistance. Humpbacks towed gear off in 17.3% of reported entrapments; the gear in these instances was usually groundfish gillnets.

Most entrapments occurred in codtraps (45%), fleets of

groundfish gillnets (31%) or salmon gillnets (15%). A few entrapments were reported in capelin traps, crab pots, mackerel traps and experimental gear (9%). The fishing season was generally "late" in 1990 - so were entrapments of humpbacks: 14.6% were reported in May; 29.3% in June; 45.3% in July; 17.3% in August and 6.7% in September.

Minkes: A total of 14 minke whales (Balaenoptera acutorostrata) were reported entrapped in fishing gear (Table 2). Two of these reports (14.3%) did not come from fishermen that caught them but were reported stranded or floating, with fishing gear on the body, by others. Thus under-reporting of this species is higher than for humpbacks; under-reporting of smaller cetacean by-catch is typically higher than for larger whales. Mortality is also higher; 11 of the 14 animals died as a result of entrapment (78.6%); 3 animals (21.4%) were released with assistance. Codtraps were most frequently the fishing gear involved in minke whale entrapments (50%); groundfish gillnet entrapments were also common (28.6%). Most (85.7%) minke entrapments occurred in July (Table 2).

Other Species of Cetaceans: Three additional species of large cetaceans were caught in inshore fishing gear during 1990 (Table 3). A northern bottlenose (Hyperoodon ampullatus) was incidentally entrapped and released alive from a squid trap. A fin whale (Balaenoptera physalus) was caught in Harbour Deep,

W.B.; this same animal was again caught near Coachman's Cove, W.B. and partially released. The animal had earlier stranded in Trinity, T.B. in September and had been towed off the beach but released towing ropes and floats. A beluga (Delphinapterus leucus) was caught in St. Lunaire in mid-June.

Strandings: There were two mass strandings of cetaceans reported during 1990. A group of four sperm whales (Physeter catadon) began stranding in Black Tickle, Labrador. One of the four was beached for a while but re-floated on high tide; all animals were successfully driven from the cove and to sea during this tide. A second stranding of pilot whales (Globicephala melas) occurred sometime during late summer near St. Anthony; these four animals were not discovered until December (Table 4).

There were two potential live strandings of northern cetaceans. A group of northern bottlenose were in the Dildo, T.B. area for a number of weeks. During this time several observers believed that the animals were stranding. Similarly a narwhal (Monodon monoceros) observed in the same area was reported as behaving in an unusual manner and near stranding. In Conception Bay, a Sowerby's beaked whale (Mesoplodon bidens) stranded in early June (Table 4).

All other strandings were of single animals and most were quite decomposed. A total of six humpbacks were stranded; we

cannot be sure if these are any of the same animals that died as a result of entrapment in fishing gear (Table 4).

Ice Entrapments: Two ice entrapments of dolphin species were reported (Table 5). In both cases groups of animals were covered by ice; no exact counts of the animals that died were made.

Sharks: There were few sharks reported to the Entrapment Assistance Program during 1990 (Table 6). A total of 6 basking sharks (Cetorhinus maximus) and 3 porbeagles (Lamna nasus) were reported entrapped. Without a market, shark by-catch is greatly under-reported.

Pinnipeds: Pinnipeds which were reported to the Entrapment Assistance Program as incidentally caught in fishing gear are listed in Table 7. Pinniped by-catch is being monitored by D.F.O. and in a joint M.U.N./D.F.O./C.W.S by-catch program. Therefore few animals were reported to the Entrapment Assistance Program.

Turtles: A program with the World Wildlife Fund encourages the reporting of leatherback turtle (Dermochelys coriacea) sightings and their live release if entrapped in fishing gear. In 1990 there were 6 sightings and 6 gear entrapments reported (Table 8). Two of the animals died as a result of entrapment.

Discussion

Humpbacks: Entrapments of humpbacks in inshore fishing gear continues at record levels in Newfoundland and Labrador. Trends in the numbers of humpbacks incidentally caught and mortality over the past decade is presented in Figure 2. A peak of entrapments occurred in 1979-1980 due to a collapse of capelin (Mallotus villosus) stocks (Whitehead and Carscaden 1985); over the past three years there have also been increases in reported entrapments.

Mortality of humpbacks resulting from incidental entrapment is a function of the time the animal spends in the gear. Prior to the Entrapment Assistance Program mortality was estimated at about 50% (Lien 1980); in years when, due to funding, the program began late mortality was also very high (Lien et al. 1988). Entrapment mortality was high this year during a week in which the capelin fishery and bad weather impeded daily checking of codtraps. Over the past five years entrapment mortality of humpbacks has averaged 9.4%.

The Entrapment Assistance Program continues to receive excellent cooperation from fishermen. Since 1979 the Whale Research Group has dealt with 887 whale entrapments at an average cost of \$220. Estimated savings for fishermen are difficult to calculate but range from \$250. - \$1,100. per entrapment (Lien

1980). There has never been a serious accident in the eleven years of the Entrapment Assistance Program.

The numbers of entrapments during the peak of the inshore fishery now requires the use of two entrapment crews to service entrapment calls in a timely manner. The growth of reports appears to be a real increase and not the result of differential reporting tendencies by fishermen. Causes for the increase are not clear but increase in the inshore fishing effort and in the numbers of humpbacks are likely reasons. There is extremely poor documentation of trends in either of these factors, however.

During 1990 work continued on the development of acoustical alarms to reduce the number of whale collisions with fishing gear (Guigne, Lien and Guzzwell 1990a; Guigne et al. 1990b; Lien, Guigne and Todd 1990e). There have been many efforts, most inconclusive, to modify fishing gear in order to reduce by-catch of cetaceans (Todd and Nelson 1990). Early "alarm" designs used in the Newfoundland and Labrador inshore fishery have been shown useful in reducing the probability of collisions and the amount of damage which results if a collision does occur (Lien, Todd and Guigne 1990a). Several studies have shown the perceptual problems that humpbacks have in detecting and locating nets due to the minimal acoustical target that nets provide and the interaction of these sounds with ambient sounds and the presence of bait (Nelson 1990; Lien, Todd and Guigne 1990a; Todd et al. 1990). The

new "alarm" devices are much louder and produce a sound which should optimize detection under these constraints (Lien, Guigne and Todd 1990e).

Early tests of humpbacks reactions to the sounds showed that the animals were curious about the devices and approached them; further, there was good evidence that the whales could quickly learn to associate the devices with biologically important events or stimuli (Lien et al. 1990c). By next summer we will have produced 300 prototype "alarms" which will be tested on codtraps in areas where major whale damage occurs. Following successful testing, "alarms" will be commercially produced in Newfoundland. Additional tests of the "alarms" will be conducted in South Africa, Australia and the North Pacific.

Small Cetacean By-Catch: The incidental captures of small cetaceans has not been adequately studied in Newfoundland and Labrador. Lien (1987; Lien et al. 1989c) found the catches of harbour porpoise (Phocoena phocoena) to be very large. In 1990 COSEWIC listed the harbour porpoise as "threatened" in waters off Eastern Canada based on studies in Gaspé and Quebec (Fontaine et al. 1990), the Bay of Fundy (Read et al. 1990) and Newfoundland and Labrador (Lien et al. 1990b). In the entire NW Atlantic stocks of harbour porpoise are poorly known but it is believed that in most areas, fishery by-catch exceeds the maximum 1% take which might be sustained (I.W.C. 1990).

Based on these data, the I.W.C. Workshop on the Mortality of Cetaceans in Passive Fishing Nets and Traps (I.W.C. 1990) held in La Jolla, California in October 1990 concluded that the NW Atlantic stock of harbour porpoise were unable to sustain current levels of removal caused by net and trap fisheries and recommended that immediate steps be taken to reduce mortality of harbour porpoises.

Based on these recommendations Memorial University, Fisheries and Oceans and the Canadian Wildlife Service began studies of the by-catch of harbour porpoise as well as seals and seabirds. This work has been supported by the World Wildlife Fund (Canada). Additional studies on the biology of the harbour porpoise (S. Richardson, personal communication) are under way at Memorial University. In addition, an education program is being planned and implemented.

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Table 1: Humpback whales reported entrapped in inshore fishing gear during 1990.

<u>Date</u>	<u>Location</u>	<u>Type of Gear</u>	<u>Comments</u>
4 May	Southern Hbr, P.B.	Codtrap	Self release
17 May	Hermitage	Gillnets	Self release
3 June	Southern Harbour	Codtrap	Dead
16 June	Bay Bulls	Salmon nets	Released alive
17 June	Old Bonavista	Salmon nets	Towed gear off
17 June	Bay Bulls	Salmon nets	Towed gear off
18 June	Ochre Pit Cove	Codtrap	Released alive
19 June	Lord's Cove	Codtrap	Self release
19 June	Bay Bulls	Salmon nets	Self release
19 June	St. Shotts	Groundfish gillnet mooring	Released alive
20 June	Lower Island Cove	Codtrap	Released alive
20 June	Baine Harbour	Codtrap	Self release
21 June	Frenchman's Cove	Codtrap	Dead
23 June	O'Donnells, SMB	Caplin trap	Released alive
23 June	Heart's Content	Caplin trap	Released alive
24 June	St. Bernard's	Codtrap	Dead
25 June	Petit Forte, PB	Codtrap	Dead
27 June	Pouch Cove	Codtrap	Dead
27 June	Bonavista	Codtrap	Self release
27 June	Bauline South	Codtrap	Dead

Table 1 (continued):

28 June	Lower Island Cove	Codtrap	Dead
28 June	Lower Island Cove	Codtrap	Dead
30 June	St. Brendan's	Groundfish gillnets	Partial release
? June	St. Bride's	Groundfish gillnets	Released alive
1 July	Bay Bulls	Codtrap	Self release
2 July	Petty Harbour	Codtrap	Released alive
2 July	St. Shotts	Groundfish gillnets	Released alive
2 July	Frenchman's Cove	Groundfish gillnets	Partial release
3 July	Heart's Content	Codtrap, salmon and groundfish gillnets	Released alive
4 July	Gaskiers	Codtrap	Self release
4 July	Cape Broyle	Salmon nets	Towed gear off
5 July	Lower Island Cove	Codtrap	Self release
7 July	Bauline South	Codtrap moorings, Salmon and Groundfish gillnets	Partial release
9 July	Mobile	Salmon nets (?)	Dead
10 July	St. Vincent's, SMB	Codtrap	Self release
10 July	Little Paradise, PB	Groundfish gillnets	Released alive
10 July	St. Mary's	Codtrap	Released alive
11 July	Herring Neck, NDB	Groundfish gillnets	Released alive
15 July	Melrose Harbour	Gillnets	Self release
16 July	Bay Bulls	Salmon nets	Towed gear off
16 July	St. Bride's	Gill nets	Towed gear off
16 July	Lower Island Cove	Codtrap	Released alive

Table 1 (continued):

19 July	Little Bay Islands	Salmon nets	Self release
19 July	Whale's Gulch	Groundfish gillnets	Self release
20 July	Mobile	Experimental gear	Self release
22 July	Cotrell's Cove	Uncertain	Partial release
23 July	Duntara	Codtrap	Self release
23 July	St. Shotts	Codtrap	Released alive
24 July	Morton's Harbour	Codtrap, flatfish gillnets	Released alive
26 July	Joe Batt's Arm	Groundfish gillnets	Released alive
26 July	Twillingate	Codtrap	Self release
28 July	St. Anthony	Codtrap	Dead
29 July	Fleur de Lys	Codtrap	Self release
30 July	St. Anthony	Salmon nets	Released alive
30 July	Ladle Cove	Codtrap	Released alive
30 July	Little Bay East, FB	Mackerel trap	Self release
31 July	Aspen Cove	Groundfish gillnets	Self release
31 July	Lord's Cove	Codtrap	Self release
2 August	St. Lawrence	Codtrap	Self release
5 August	Twillingate	Codtrap	Self release
7 August	Barr'd Islands	Codtrap	Released alive
9 August	Renews	Codtrap	Self release
9 August	Trepassey	Groundfish gillnets	Towed gear off
9 August	Twillingate	Unidentified gear in mouth	Self release
14 August	Mary's Harbour	Crab pots	Partial release
15 August	Deep Bay, Fogo	Groundfish gillnets	Towed gear off

Table 1 (continued):

16 August	Seldom, Fogo	Groundfish gillnets	Towed gear off
16 August	Ladle Cove	Groundfish gillnets	Self release
22 August	Elliston	Groundfish gillnets	Released alive
24 August	Seal Island	Codtrap	Released alive
	Labrador		
31 August	Cape St. Francis	Crabpots	Dead
	(68 nm off)		
9 Sept	Hermitage Bay	Groundfish gillnets	Towed gear off
14 Sept	Funk Island	Salmon nets	Towed gear off
17 Sept	St. Bernard's	Unidentified	Towed gear off
		Gillnet	
Sept	Tadoussac, Que.	Unidentified	Towed gear off
		Gillnet	
28 Sept	Miquelon	Gillnets	Towed gear off

Table 2: Minke whales reported entrapped in inshore fishing gear during 1990

<u>Date</u>	<u>Location</u>	<u>Type of gear</u>	<u>Comments</u>
3 July	Bay Roberts	Capelin trap	Dead
5 July	St. Bride's	Groundfish gillnets	Released alive
10 July	Manuels	Groundfish gillnets	Released alive
10 July	Chance Cove, TB	Codtrap	Dead
11 July	Summerville, BB	Codtrap	Dead
15 July	Ferryland	?	Dead
17 July	Renews	Codtrap	Dead
19 July	Terrenceville	?	Dead
22 July	Dildo	Codtrap	Dead
25 July	Nipper's Harbour	Codtrap	Dead
27 July	Lord's Cove	Codtrap	Dead
28 July	Twillingate	Codtrap	Dead
28 Sept	Southern Harbour	Groundfish gillnets	Dead
14 Nov	Brigus South	Groundfish gillnets	Released alive

Table 3: Other species of cetaceans reported entrapped in inshore fishing gear during 1990.

Date	Location	Species	Comments
13 June	St. Lunaire	Beluga	Dead in lumpnet
5 Sept	Dildo, T.B.	Northern Bottlenose	Released alive from a squid trap.
29 Sept	Harbour Deep	Fin	Towed gillnets off.
8 Oct	Baie Verte	Fin	Released alive from variety of gear - Towed gear off.

Table 4: Stranded cetaceans reported during 1990.

Date	Location	Species	Comments
30 April	Northwest River, Labrador	10m baleen whale (Sei ?)	Dead; old
? June	Whale's Gulch	Beluga	3m est
9 June	Seal Cove	Sowerby's	Female; examined
12 June	Southern Harbour	Porpoise	Dead; codtrap
28 June	Garnish	Humpback (?)	Dead
2 July	Mobile	Humpback	Floating
3 July	Garnish	Humpback (?)	Dead
9 July	Baie Verte	Humpback (?)	Reported about to strand, but did not
22 July	Off Bonavista	Humpback (?)	Dead
31 July	Twillingate	Humpback(?)	Dead
31 July	Aspen Cove	Beluga	Alive; acting strangely
4 August	Salt Cove, Burin	White sided dolphin	Dead; old
1 Sept	Dildo	Northern Bottlenose	Acting strangely
10 Sept	Trinity Harbour	Finback	Towed off; alive but trailing gear
28 Sept	Dildo	Narwhale	Sighting

30 Sept Black Tickle, Lab 4 Sperm Driven out

Table 4: continued.

20 Oct	Bay Komo	Blue	Stranding
?	Grand Codroy	Blue	Stranding
14 Dec.	St. Anthony	4 Pilot	Dead; old.

Table 5: Ice entrapments of cetaceans reported during 1990.

<u>Date</u>	<u>Location</u>	<u>Species</u>	<u>Comments</u>
6 Feb.	Jamestown	Dolphins	Died in ice
		Spp. ?	
March	Rencontre East	Dolphins	Died in ice
		Spp. ?	

Table 6: Sharks reported incidentally caught in inshore fishing gear during 1990.

<u>Date</u>	<u>Location</u>	<u>Species</u>	<u>Type of gear</u>
3 July	Torbay	Basking	Codtrap
4 July	Portugal Cove South	Basking	Codtrap
30 July	St. Bride's	Basking	Groundfish gillnets
4 August	Spotted Islands, Labrador	Porbeagle	Groundfish gillnets
4 Sept	Whiteaway, TB	Basking	Squid trap
14 Sept	Eastport, BB	Basking	Mackerel net
28 Sept	Snug Harbour, Lab.	Basking	Unknown
4 Oct	Dunville, PB	Porbeagle	Longlines
8 Oct	Random Island	Porbeagle	Longlines

Table 7: Pinnipeds reported incidentally entrapped in inshore fishing gear or stranded in 1990. *

<u>Date</u>	<u>Location</u>	<u>Species</u>	<u>Comments</u>
19 May	Change Islands	Hood seal	Dead
24 May	Renews	Ring seal	Alive at OSC
28 May	Terrenceville	Walrus	Released alive
9 July	Holyrood	Harp seal	Dead
11 Nov	Spaniard's Bay	Jar seal	Alive at OSC
18 Nov	Chapel Cove	Hood seal	Dead
24 Dec	Spanard's Bay	Harp seal	Alive- released

* Note that these records are simply the ones which are reported on the Entrapment Assistance Program phone. There are many others and this table does not represent a true picture of pinniped entrapments and strandings.

Table 8: Turtles reported incidentally caught in inshore fishing gear during 1990.

<u>Date</u>	<u>Location</u>	<u>Type of gear</u>	<u>Comments</u>
2 Aug	La Scie	Groundfish gillnets	Released alive
10 Aug	Lord's Cove	Sighting	
16 Aug	Lamaline	Sighting	
20-23 Aug	Lamaline	Sightings	
4 Sept	Grand La Pierre	Mackerel gillnets	Dead
12 Sept	Burin	Groundfish gillnets	Released alive
17 Sept	Seal Cove, WB	Unidentified	Released alive
25 Sept	Happy Adventure	Sighting	
27 Sept	Tilting, Fogo	Sighting	
1 Oct	Leading Tickles	Herring nets	Released alive
8 Oct	Kelly's Island	Sighting	M a y h a v e rope in mouth
16 Oct	Old Perlican	Longlines	Dead