Incidence of lost or discarded drift nets recovered in Canadian waters during 1986, and preliminary observations for 1987.

by

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Japanese, Taiwanese, and Korean vessels annual conduct extensive drift(gill) net fisheries for flying squid, Ommastrephes bartrami in the North Pacific Ocean. It is currently difficult to obtain reliable estimates for the total amount of fishing gear and effort involved in this fishery, although it is clear that it is substantial. For example, in 1983 an average of 150 Japanese vessels (I.N.P.F.C. document #3310), and approximately 200 Korean vessels (Gong et al. 1985), and 101 Taiwanese vessels (Chen 1985) participated in high seas squid fisheries. Each vessel typically deploys 30 to 50 km of gill net each night, amounting to a total of 13530 to 22550 km of gill net in the water each night. The high seas squid fishery has continued to expand since 1983, so it is likely that this is a conservative estimate of the amount of vessels and gear involved in more recent years.

Concerns have been raised regarding the possibility that substantial quantities of drift nets may be lost or discarded at sea. This is primarily due to the nature and large quantities of fishing gear deployed in the high seas drift net fisheries, the fact that the nets are not anchored, the often difficult sea conditions encountered in the North Pacific, and the heavy commercial vessel traffic which presumably severs many nets. The main concern appears to be that any lost or discarded gear may continue to "ghost fish" for long periods, possibly capturing and killing significant numbers of salmon, sea mammals, and sea birds, before finally sinking to the ocean bottom or washing ashore. In Canada, these concerns have been raised by commercial fishermen, regarding possible losses of Canadian salmon on the high seas and in territorial waters, and by members of various conservation societies and organizations concerned about possible destruction of, or injuries to, marine mammals and birds. There is also a concern that increasing incidence of these lost or discarded drift nets might soon pose a navigation hazard for vessels in Canadian coastal waters.

In 1986, the Canadian Department of Fisheries and Oceans initiated a volunteer observer program, called the Drift Net Program, to address these concerns. To obtain the cooperation and assistance of as many people as possible, the folowing measures were taken:

1. Advertisements were placed in commercial, industry-related newspapers and magazines, describing the appearance of high-seas drift nets, and asking fishermen and the general public to report any sightings of unattended nets, seen either in the water or washed up on the shore. In 1986, advertisements appeared in the April issue of "The Fisherman" newspaper (distribution of approximately 9000 copies per issue). In 1987, advertisements were published in the May and June issues of "The Fisherman" newspaper, in the May and June issues of "The Native Voice" newspaper (distribution of approximately 2000 copies per issue), and in the May issue of "The West Coast Fisherman" magazine (distribution of approximately 15000 copies per issue, including 12500 copies mailed directly to fishermen).

2. The Offshore Surveillance Division, Department of Fisheries and Oceans, was asked to keep a continuous watch for drift nets on all Patrol Vessels. All Fisheries Officers were also requested to watch for drift nets.

3. Fisheries companies and organizations, including the Pacific Gillnetters Association, and the Deep Sea Trawlers Association, were asked to place posters in conspicuous locations, informing fishermen of this program and requesting their cooperation and assistance.

4. A total of 97 commercial trollers involved in the West Coast Troll Program administered by the Department of Fisheries and Oceans, and fishing throughout the coastal waters of British Columbia, were instructed to report on their daily log sheets any sightings of drift nets.

RESULTS

The results of this program are summarized for all information and samples of nets that were obtained through this program from 1 April 1986 to 31 January 1986 (Table 1), and from 1 January to 30 August 1987 (Table 2). The results for 1987 are preliminary, and may require revisions to include any additional observations reported during the period of 1 September to 31 January, 1987.

DISCUSSION

In 1986 a total of 12 samples of gill netting were obtained, and a total of 4 additional sightings were reported but samples of netting were not taken. Analyses of the net samples indicated that all were monofilament, and all but one sample had mesh sizes ranging from 108.5 to 114.9 mm (4.25 to 4.50 inch) stretched mesh. One additional sample consisted of monofilament netting with a mesh size of 160 mm (6.25 inch) stretched mesh. All but one of the sightings were from either beaches or shallow water near beaches. Only one troll fisherman reported that his fishing gear had tangled in a drift net while fishing. This particular net was the only one sighted in deep water, had apparently had been in the water a long time (judging from the growth of barnacles on it), and was still "ghost fishing" at the time it was sighted.

In 1987, a total of 25 samples of gill netting were reported prior to 1 September. All but one sample consisted of monofilament mesh, ranging in size from 96 to 147 mm (3.75 to 5.75 inch) stretched mesh. Most samples were found on or near beaches. However, three samples were obtained from nets drifting over deep water, and in two cases the nets actually fouled the propellers of vessels sufficiently to temporarily incapacitate the vessels.

In terms of origin, the vast majority of the nets reported through this program probably arise from high seas drift net fisheries. The net samples indicate that all but one net were constructed of monofilament, with a typical size range of approximately 100 to 120 mm (4 to 4.7 inches) stretched

mesh. This is the type of material and size range of netting typically used in high seas squid drift net fisheries (Ignell 1985; Gong et al. 1985). The oblong-shaped styrofoam or plastic floats attached to the net samples are identical to those commonly used on high seas drift nets, but rarely used by Canadian and United States fishermen. In addition, Canadian fisheries regulations prohibit the use of monofilament gill nets with mesh sizes larger than 57 mm (2.25 inch) stretched mesh size in British Columbia waters. This regulation is strictly enforced, so it is unlikely that any of these nets are of Canadian origin. It is possible that some of these nets originate in the United States and drift north from Washington, Oregon, or California, or drift south from Alaska. For example, recent changes in fishing gear regulations in Washington State, U.S.A., now permit use of monofilament gill nets in commercial salmon fisheries. The mesh sizes of the gill nets that are permitted under United States fisheries regulations are quite variable, and include some fisheries where the mesh size must be at least 165 mm (6.5 inches). The oceanographic current regimes along the west coast of Washington could carry lost or discarded gill nets from Washington into Canadian waters. This may account for some of the nets reported through this program, particularly nets with the mesh sizes greater than 153 mm (6 inch) stretched mesh.

Despite the substantial numbers of sightings, it is difficult to estimate the amount of drift net that enters Canadian waters each year, or the impact these nets have on fish, mammals, and birds. There are thousands of kilometers of British Columbia coast line that are very difficult to access by either boat or land, or infrequently visited. Thus the samples and sightings reported through this program likely represent only a small fraction of the drift nets that have entered Canadian waters, and eventually washed ashore. On the other hand, monofilament decays slowly, and unless the net is still drifting, or only very recently washed ashore, it is very difficult to estimate how much time has elapsed since any particular piece of netting entered Canadian waters.

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Table 1. Comments, observations, and descriptions of samples of netting reported in 1986.

Date	Location	Observation or comments	Reported by
28/4/1986	West Coast Vancouver Island	General comment: beaches from Tasu to Flamingo Harbor littered with monofilament nets. No samples provided.	Larry Wicks Vessel Owners Association
26/5/1986	Englefield Bay, Queen Charlotte Islands	Part of monofilament gill net. 108.5 mm mesh. Sample lost in mail.	Jerry Kozak Fisheries Officer Queen Charlotte City
29/5/1986	West Coast Queen Charlotte Islands	General comment: saw bundles of monofilament gill nets on beaches around Security Inlet in April and May. No samples provided.	Randy Warnock Fisherman Qualicum, B.C.
18/6/1986	Houston-Stewart Channel, Queen Charlotte Islands	Reported three sightings on log sheets of Troll Logbook Program. Three samples sent: sample 1: 111.7 mm mesh sample 2: 108.5 mm mesh sample 3: 111.7 mm mesh	Ken Campbell Skipper MV CHARIOT
23/6/1986	La Parouse Bank, South W. Vancouver Island (Loran coordinates: 29090-41590)	Gill net caught in fishing gear and taken aboard. Net was picked up by DFO staff at Bamfield and taken to P.B.S. Photos taken and length estimated to be 183 m. Net contained: 1 fur seal, 1 coho salmon, numerous rockfish, dogfish, and gooseneck barnacles. No lead line but samples of meshes and corks taken: 108.5 mm mesh.	Joe Garcia Skipper MV SONORA II
3/7/1986	Hippa Island, West Coast Queen Charlotte Islands	Sample of corks, cork line, and meshes from gill net: 108.5 mm mesh.	Kenneth Harley Master, FPV SOOKE POST (via G. N. Buechler, Chief, Offshore Surveillance)
3/7/1986	Calamity Bay, South Banks Island	Fisherman reported unusually large bundle of monofilament gill net. Fisherman measured meshes: 108.5 to 114.9 mm. No samples taken.	B.C. Packers Prince Rupert

Table 1 cont'd

Date	Location	Observation or comments	Reported by
28/7/1986	Becher Bay, South West Vancouver Is.	Sighted small bundle of monofilament gill net webbing on beach. Estimated length of 10 to 20 m but very tangled. Sample of mesh: 108.5 mm.	Mike Smith Pacific Biological Station.
28/7/1986	Port Louis, West Coast Queen Charlotte Islands	Sample of corks, cork line, and meshes from monofilament gill net: 111.7 mm mesh. Corks were round (approximately 129 mm diameter) and made of plastic.	residents of Port Louis (via Kenneth Harley, Master, FPV SOOKE POST)
1/9/1986	Bonilla Island, N.E. Hecate Strait	Sample of corks, cork line, and meshes from monofilament gill net: 111.7 mm mesh. Bird bones tangled in meshes.	Bill Shemming Skipper, MV WYVERN
6/9/1986	Kootenay Inlet, West Coast Queen Charlotte Islands	Sample of corks, cork line, and meshes from monofilament gill net: 114.9 mm mesh.	Kenneth Harley Master, FPV SOOKE POST
8/9/1986	Security Inlet, West Coast Queen Charlotte Islands	Sample of corks, cork line, and meshes from monofilament gill net: 114.9 mm mesh.	Kenneth Harley Master, FPV SOOKE POST
Sept. 1986	Gowgaia Bay, West Coast Queen Charlotte Islands	Sample of meshes from monofilament gill net: 114.9 mm mesh.	MV OCEAN STAR (via DFO Fisheries Patrol Vessel)
1/12/1986	Louscoone Inlet, West Coast Morseby Island	Sample of corks, leadline, and webbing from monofilament gill net: 159.6 mm mesh	FPV ARROW POST

Table 2. Comments, observations, and descriptions of samples of netting reported in 1987. Only data reported prior to 1 September are included.

Date	Location	Observation or comments	Reported by
Aug./1986	South Cape Scott, Vancouver Island	Found small piece of monofilament gill net with corks and large (358 to 409 mm) plastic float attached, with name "Sanshin Kako Co." on float. Sample of mesh: 111.7 mm.	Art Cheshire, Master, MV PAGAN ISLE.
22/3/1987	South West Vancouver Island	Picked up small bundle of monofilament gill net floating offshore. Sample of corks, cork line, and meshes: 108.5 mm meshes. Corks: 204 x 64 x 32 mm.	Al Ranger, Master W.E. RICKER
24/3/1987	Hammond Bay, East Coast Vancouver Island	Net found on beach. No corks or lead line attached. Meshes made of nylon (not monofilament) mesh size: 134 mm.	Dick Beamish Pacific Biological Station
9/4/1987	Louscoone Inlet, West Coast Morseby Is.	Two monofilament gill nets found on beach, both with corks. sample 1: 111.7 mm mesh and 204 x 64 x 38 mm corks sample 2: 111.7 mm mesh and 204 x 64 x 38 mm corks	Kenneth Harley Master, FPV SOOKE POST
10/4/1987	Staki Bay, Flamingo Inlet, West Coast Morseby Is.	Samples of monofilament mesh from seven different gill nets found on beach, five nets had corks attached. sample 1: 114.9 mm mesh and 204 x 64 x 38 mm corks sample 2: 108.5 mm mesh and 204 x 64 x 51 mm corks sample 3: 108.5 mm mesh and 204 x 51 x 38 mm corks sample 4: 103.7 mm mesh and 185 x 64 x 38 mm corks sample 5: 94.2 mm mesh and 198 x 64 x 38 mm corks sample 6: 146.8 mm mesh sample 7: 110.1 mm mesh	Kenneth Harley Master, FPV SOOKE POST

Table 2 cont'd.

Date	Location	Observation or comments	Reported by
13/4/1987	McKenzie Cove, West Coast Morseby Is.	Two monofilament gill nets found on beach, both with corks: sample 1: 116.5 mm mesh and 204 x 64 x 38 mm corks sample 2: 114.9 mm mesh and 204 x 64 x 38 mm corks	Kenneth Harley Master, FPV SOOKE POST
13/4/1987	Security Inlet, West Coast Morseby Inlet	Two monofilament gill nets found on beach, both with corks attached: sample 1: 110.1 mm mesh and 192 x 64 x 38 mm corks sample 2: 95.9 mm mesh and 192 x 64 x 38 mm corks	Kenneth Harley Master, FPV SOOKE POST
2/5/1987	32 n miles west of Cape Calvert	Large monofilament gill net caught in propeller and incapacitated vessel. Three-colored mesh types: 111.7 mm mesh. No samples of corks obtained but corks described as "banana shaped".	Paul Edwards Master, MV LAUREL ANN (via Dave Rekdal Fisheries Off., Port Hardy
6/5/1987	Cape St. James, Queen Charlotte Is.	Monofilament gill net fouled propeller. Sample of mesh: 108.5 mm. No sample of corks obtained.	E.J. Teigen Master, MV PAKALOT
12/5/1987	Calvert Island, Queen Charlotte Sound	Monofilament gill net found drifting, estimated to be 80 feet (24 meters) long, and full of gooseneck barnacles. Sample of corks and mesh: 108.5 mm mesh and 204 x 64 x 38 mm corks.	Brian Hedquist Master, MV RENNEL SOUND (via Scott Trent Comox Stream Guardian)
20/6/1987	Moore Island Group, South East Hecate Strait	Monofilament gill net found on beach, estimated to be 10 fathoms (18.3 m) in length. Sample of corks and meshes: 108.5 mm mesh and 166 x 38 mm corks (long and round).	Larry Andrews Master, MV COPPER SUNRISE (via Dave Redkdal, Fishery Officer, Port Hardy

Table 2 cont'd.

Date	Location	Observation or comments	Reported by
25/7/1987	Triangle Is., North West Vancouver Is. Loran 13496x 29992y	Small piece of monofilament gill net found drifting at sea. No length estimate given. Sample of mesh: 108.5 mm.	Lawrence Haines Master, MV CHRISTINA B
29/7/1987	Frederick Is., North West Graham Is.	Monofilament gill net found on beach along with "hundreds of drift net corks". No length estimate for net. Sample of mesh: 108.5 mm.	Dave Hardie MV NORTHERN STAR
14/8/1987	Sialun Bay, North West Graham Is.	Monofilament gill net found on beach. Many others observed in same area. No length estimates given. Sample of mesh: 108.5 mm.	Jose Alemany Master, MV AKKO CHAN