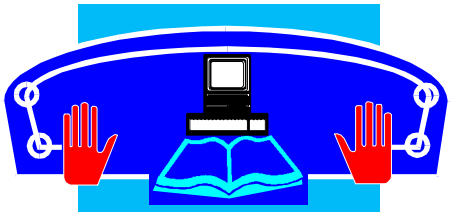

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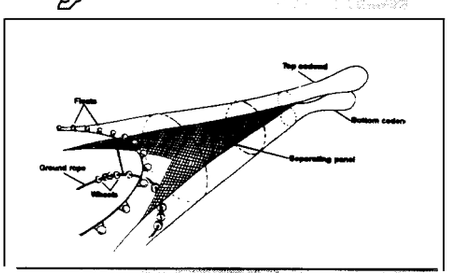
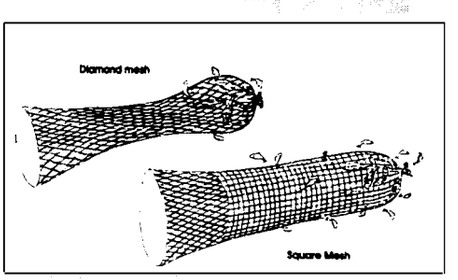
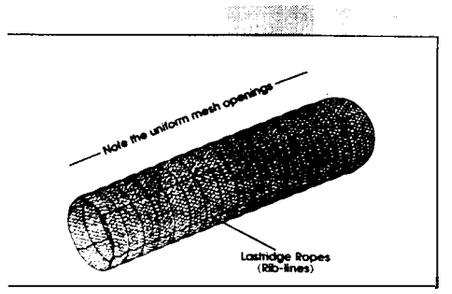
CANADIAN FISH HARVESTING PROGRAM

FOR RESPONSIBLE FISHING







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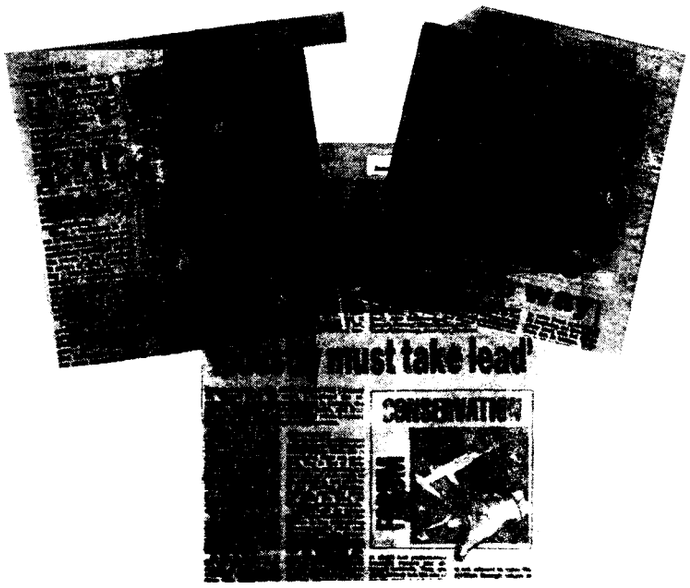

CANADIAN FISH
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FOR RESPONSIBLE FISHING

1992

Fishin$_g$ Industry Services
Fisheries operations
The Department of Fisheries and Oceans
Canada

FISH I NG INDUSTRY SERVICES

CANADIAN FISHING HARVESTING PROGRAM

FOR RESPONSIBLE FISHING

FOREWORD BY

David Balfour
Director
Fishing Industry Services
Fisheries Operations
Fisheries and Oceans

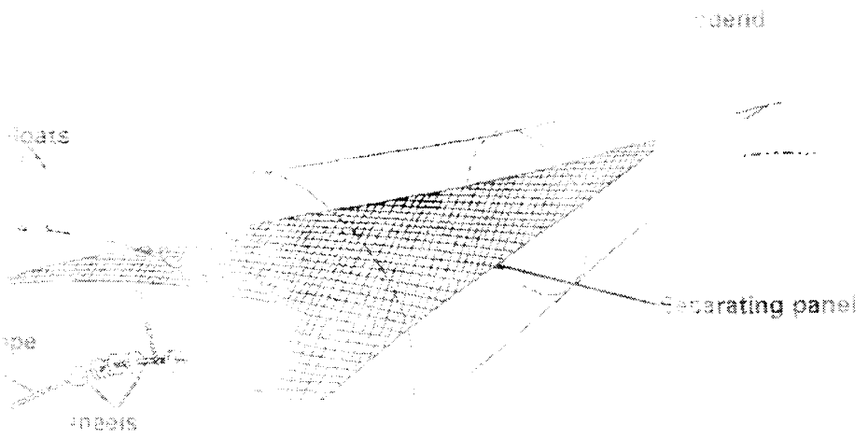
Serious fish resource problems in Canada and a growing environmental consciousness have resulted in pro-active efforts by Canada to reinforce responsible fishing practices and introduce new efficiencies into fish harvesting operations.

The Canadian Fish Harvesting Program For Responsible Fishing is designed to provide solutions to these problems. A series of initiatives by the Fishing Industry Services Branch of the Canadian Department of Fisheries and Oceans, supported by Energy, Mines and Resources (PERD) in partnership with the Canadian fishing industry and related provincial government agencies, span the country. In the Atlantic and Pacific fisheries, the Great Lakes and the Arctic, projects focus on good operational fishing practices to ensure energy conservation, reduction of pollution and selective fishing gear and methods. Developments in new harvesting technology, workshops in technology transfer and training, and experiments in fishing gear selectivity are ongoing. All of these initiatives are to ensure that fishermen get the optimum returns for their fishing efforts. Such a comprehensive program embraces the need for efficiency, profitability and competitiveness of commercial fishing operations without further expanding capacity. This is essential for sustainable fisheries development.

Canadian projects begin with a cooperative approach, building consensus within all parties, and looking with both a national and international perspective at the challenges facing the global fishing community.

CANADIAN FISH HARVESTING PROGRAM

FOR RESPONSIBLE FISHING



The Canadian Fish Harvesting Program for Responsible Fishing involves the following program activities:

Canadian Industry Consultations

International Consultations

Canadian Fishing Gear Selectivity Initiatives

Vessel Design Initiatives

Technology Transfer and Training

Assessment Studies

- **Lost or Abandoned Gear**
- **Fish Dumping/Discarding**
- **Technical Harvesting**

Technical Ordination

FISHING INDUSTRY SERVICES

1. CANADIAN FISHING INDUSTRY CONSULTATIONS

Partnership and cooperation with fishermen and the Canadian fishing industry is the key element in the Canadian Fish Harvesting Program conducted by the Fishing Industry Services Branch.

In line with its objective to reinforce responsible fishing within a context of sustainable fisheries development, Fishing Industry Services entered into a number of consultations with commercial fishing industry representatives, and Provincial and Territorial Governments.

Key consultations included:

1

FISHING VESSEL DESIGN

A technical workshop in Vancouver involved naval architects, boat builders, engineers, fishing industry representatives and federal and B.C. provincial government representatives in the technological development of modern fishing vessel design. This workshop led, in part, to 1992 initiatives on vessel design and gear selectivity consultations for the Pacific, freshwater and Atlantic fisheries; to an international (IEA) consultation on cooperative vessel design and optimization; and four on-site consultations on vessel design and options for Northern fishermen.

2

ARCTIC FISH HARVESTING

1989 and 1990 technical workshops and industry consultations in Canada's north on harvesting innovations, underutilized species development and cost reduction/energy conservation for northern Canadian fishermen led to an initial 1991 industry consultation in Yellowknife, NWT. on vessel design requirements to meet harvesting needs for fish species available in the North. Results of this work expanded further in presentations and consultations to a number of major northern fishing communities.

3

ARCTIC TECHNOLOGY TRAINING

The industry consultation held in Hay River, NWT in October 1992 was part of the ongoing technology transfer/ training consultations with northern Canadian fishermen. The October session determined training needs and the development of an industrial training/certification package for Great Slave Lake fishermen.

4 **BRITISH COLUMBIA TRAWL FISHERMEN**

In partnership with the Deep Sea Trawlers Association of British Columbia and the B.C. Ministry of Agriculture, Fisheries and Food, the Fishing Industry Services Branch held an industry/government consultation in November 1991 to address technological developments in fish harvesting selectivity. participants included fishing gear manufacturers, consultants in fisheries research, fishermen, and gear specialists from eastern Canada, England, Norway and Scotland.

5 **NEWFOUNDLAND AND ATLANTIC GEAR SELECTIVITY WORKSHOPS**

The 1992 Newfoundland and Atlantic Mobile Gear Selectivity workshops involved Canadian industry leaders, international experts in fishing gear technology and commercial fishermen from eastern Canada, the Great Lakes and British Columbia. Participants focussed on the needs for future work in gear selectivity experimentation.

II. INTERNATIONAL CONSULTATIONS

Consultations do not end at Canada's borders, but extend to include the global fishing community. Fishing Industry Services has participated in a number of conferences and consultations with international fisheries organizations.

No international regulations, guidelines or common practices exist for the marking of fishing gear deployed outside national jurisdictions. The FAO, with Canadian support, is moving to correct the problem.

1 INTERNATIONAL STANDARDS FOR MARKING FISHING GEAR

The International (FAO) Expert Consultation on the Marking of Fishing Gear was hosted by Canada and arranged to prepare an international standards system and specification set for the marking of fishing gear as well as guidelines by which such a system could be put into operation. Participants from sixteen countries contributed technical expertise. This consultation led to a series of technical working group consultations this year in Rome. The report developed by the consultation will be presented to the FAO Committee on Fisheries by 1993.

2 CODES OF CONDUCT FOR RESPONSIBLE FISHING

Canada presented the paper, "Canadian Fish Capture Activities" at the 1992 FAO International Consultation on the Development of Codes of Conduct for Responsible Fishing held in Mexico. More than 600 delegates from 66 countries examined fishing gear selectivity on an international scale. The Consultation also recognized that states should take steps to improve their own management systems as part of the practice of responsible fishing and that the principal of sustainable utilization of marine living resources should be the basis for sound fisheries management policies. One of these steps was the agreement for an international conference organized by the United Nations on high seas fisheries.

3 INTERNATIONAL FISHERIES ENERGY OPTIMIZATION

The first IFEO (International Fisheries Energy Optimization) working group session was organized by Canada and held in Vancouver in 1989. Gear specialists, naval architects, boat builders, scientists and fishing industry leaders from over 16 countries reviewed ongoing research on energy optimization in the areas of fishing vessel design, propulsion systems, fishing gear, operations and technology transfer.

INTERNATIONAL WORKSHOPS ON FISH BEHAVIOUR AND GEAR SELECTIVITY

Canadian fishing gear specialists participated in technical consultation sessions and exchanged information with international gear experts at the June 1992 ICES Fish Behaviour Conference in Bergen, Norway and the October 1992 Workshop on Fish Behaviour and Gear Selectivity in Washington, D.C.

m. CANADIAN FISHING GEAR SELECTIVITY INITIATIVES

From quantity to quality: improved selectivity in fishing gear will target harvesting efforts more precisely and reduce pressure on the resource.

The Canadian fish capture selectivity program provides a direct link between the Pacific, fresh water and Atlantic fisheries. Fishing gear selectivity initiatives are designed to allow for the escapement of immature fish and non-target species.

These initiatives include the design, development, demonstration and application of selective, cost-efficient and environmentally friendly fishing gears. Emphasis is placed on carrying out the work on commercial fishing vessels and in cooperation with fishermen in partnership with the Canadian fishing industry.

A. EASTERN CANADA

FISHING GEAR SELECTIVITY RESEARCH IN ATLANTIC CANADA

Rebuilding stocks is one component of the Canadian Atlantic Fisheries Adjustment Program and within this component is the framework for a full review of conventional fishing gear and its impact on the resource. As a result of this need for fishing gear selectivity research in Atlantic Canada, a series of gear selectivity test projects are being undertaken and sponsored by the Department of Fisheries and Oceans. In particular, projects will focus on gear designed to reduce the incidental capture of non-target species and immature fish, especially cod, haddock and pollack. It is estimated that conservation in the form of more selective gear could lead to an additional $10 million landed value in just cod and haddock.

In 1992 there were 32 selectivity projects in the Atlantic:

Newfoundland	7 projects
Scotia-Fundy	9 projects
Gulf Region	8 projects
Quebec Region	7 projects
Atlantic	1 project

A glimpse of some of these projects provides a brief understanding of the work undertaken and the results reached:

1992 Newfoundland and Atlantic Mobile Gear Selectivity Workshops reviewed the results of a number of selectivity experiments in the region and put in place future goals in gear selectivity research. These included:

A) SCOTIA/FUNDY REGION GEAR SELECTIVITY EXPERIMENTS

Experiments on shrimp grates to limit groundfish by-catch and limit the shrimp loss resulted in a decrease of by-catch from 39% to 1.70/o on a commercial fishing vessel. Shrimp loss was as low as 1% to 2%. Future use will involve using two grates.

A second project focussed on the successful use of a cod/haddock separator trawl.

Recent tests using a selective trawl grid (excluder grate) to reduce bycatches of cod, haddock and pollack in the Silver Hake fishery showed up to a 95 per cent reduction in bycatch.

In addition, several projects now in the planning stages, will involve Sortex, Harbour Porpoise, and Danish Seiner Selectivity experiments.

B) NEWFOUNDLAND OFFSHORE MOBILE GEAR SELECTIVITY

As a result of a number of mobile gear selectivity studies by Fisheries and Oceans in cooperation with Fishery Products International, future selectivity experiments will focus on using lastridge rope codends as the best method of operating or rigging a groundfish otter trawl to reduce juvenile groundfish catches.

C) GULF OF ST. LAWRENCE INSHORE MOBILE GEAR SELECTIVITY

Adaptation and assessment of the Nordmore Grate, the use of the split panel trawl for segregation of flatfish from cod, and the design and testing of a shrimp separator trawl were among the 1992 selectivity projects sponsored by the Canadian Department of Fisheries and Oceans.

Five additional selectivity projects in the Gulf region were undertaken as a part of juvenile fish research. These included increased mesh size selectivity studies for mobile gear, mid-water trawling assessment for the shrimp fishery,

assessment of small Scottish seiners mesh size, a mesh size selectivity assessment for hake in the Northumberland Strait, and a selectivity study into American plaice diamond mesh.

The workshops involved Canadian industry leaders, international experts in gear technology, and commercial fishermen from eastern Canada, the Great Lakes and British Columbia. Their objective was a consensus for future gear selectivity experimentation aimed at improving catch selectivity and overall efficiency. Commercial vessels in commercial operations will be used, joint initiatives between the Canadian government and Canadian fishermen are a priority, as is the objective of identifying initiatives on a species by species basis. Experiments will aim for future selectivity that allows for not just the escapement of juvenile fish, but the recruitment of this fish back into the stock; non-targeted fish must survive the selectivity process.

4. In the Atlantic, an Atlantic Technical Fish Capture Working group was established in 1992 to coordinate Atlantic fishing gear selectivity initiatives. Members consist of a Department of Fisheries and Oceans gear specialist from each of the four Atlantic regions, chaired by Andrew Duthie, Chief of Fisheries Technology, Fishing Industry Services. Industry participation is intended to be a strong component of this working group.

5. In 1992/93 Canadian Fishing Gear Selectivity initiatives in Eastern Canada include:

QUEBEC:

- gear conversion in shrimp trawl selectivity
- technology transfer of galvanic time release (crab pots)
- improvement of groundfish trawl net selectivity
- adaptation of the trollex rigid sorting device to inshore trawlers
- improved Nordmore Grate conversions
- gillnet mesh size selectivity project assessment
- restructuring of Magdalen Island longline operations

GULF REGION:

- modification to the Nordmore Grate
- evaluation of gear modification in the American Plaice fishery
- selectivity of trawls and seines with short lastridge ropes
- selectivity study of hake mesh sizes in the Northumberland Strait
- cod trap selectivity study in Western Newfoundland
- selectivity study of crab traps

SCOTIA/FUNDY REGION

- shrimp sizing grate trials
- Harbour Porpoise depth of dive study
- Danish seining experiment with square mesh
- cod/haddock separator trawl
- impact of bait size on selectivity of longline gear
- ghost fishing by gillnets
- silver hake separator trawl

NEWFOUNDLAND

- offshore otter trawl selectivity: short lastridge rope, horizontal, and large square mesh experiments
- cod trap selectivity
- shrimp trawl selectivity
- inshore otter trawl selectivity

B. ARCTIC

In the Arctic, the Department of Fisheries and Oceans conducted a technical consultation focussing on selectivity in fixed gear (cod traps) with fishermen from the Northwest Territories and Labrador.

Plans for 1993 may include the establishment of an Arctic Technical Fish Capture Working group comprising Arctic fishermen groups in association with the Territorial Government.

C. GREAT LAKES

Canada's efforts to encourage responsible fishing extend to fresh water fisheries in the Great Lakes. Twenty-five hundred people working in the fishery last year produced over 54 million pounds of fish with a landed value of over S42 million.

The Department of Fisheries and Oceans in joint initiatives with the Ontario Fish Producers' Association and two ministries of the Ontario government are conducting experiments on Lake Erie using a Nordrnore Grate and square mesh in mobile (trawl) gear. Results of the project, including underwater camera footage of the experiment will be presented at the annual OFPA industry convention in January 1993. Future selectivity research on the Great Lakes will be discussed at this session.

Plans for 1993 may include the establishment of a Great Lakes Technical Fish Capture Working group comprising the Ontario Fish Producers' Association (OFPA) and the Ontario government.

D. WESTERN CANADA

In British Columbia in 1991, Fisheries and Oceans conducted a gear selectivity worksho, with Pacific coast trawl skippers in partnershi, with the Deep Sea Trawlers' Association of B.C. and the provincial government. This workshop was the first step in a process to develo, and introduce harvesting technolo, which would ensure economic viability and sustainable use of the resource. Specialists from Canada, England, Norway and Scotland presented results of gear selectivity experiments which ma, have application within the B.C. trawl fishery.

As a result of the workshop, a Technical Fish Capture Workin, Group was established with a mandate to explore ways to improve trawl gear selectivity and to identify development opportunities.

The 1992 Trawl Gear Selectivity and Development Program for British Columbia was put into place. To date, four major initiatives are planned with industry as full and active partners with Canada's Department of Fisheries and Oceans and the provincial government:

A) Gear Selectivity Business Plan

This technical plan enables Canada's Department of Fisheries and Oceans to address the future development of the B.C. trawl fishery and to improve trawl gear selectivity.

B) Halibut By-Catch Experiment (Shrimp Trawls)

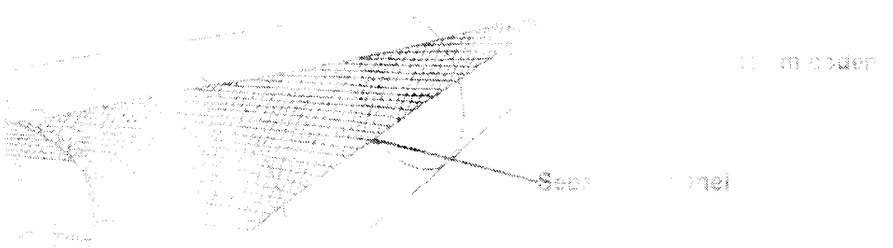
A shrim, trawler will conduct a ten-da, halibut by-catch experiment in the Hecate Strait area. The emphasis is placed on reducin, or eliminatin, halibut by-catch in shrim, trawls through the use of separator panels.

C) Shrimp By-Catch Experiment

A twelve-da, experiment on commercial fishin, grounds will investigate various means of reducin, the catch of non-target species (primarily eulachons) caught b, shrim, trawls.

D) Deep water (SEAMOUNT) Trawling

A ten-da, commercial surve, on selected seamounts off the B.C. coast with the intent to develo, a capability for larger trawlers to expand their operations into deeper waters.



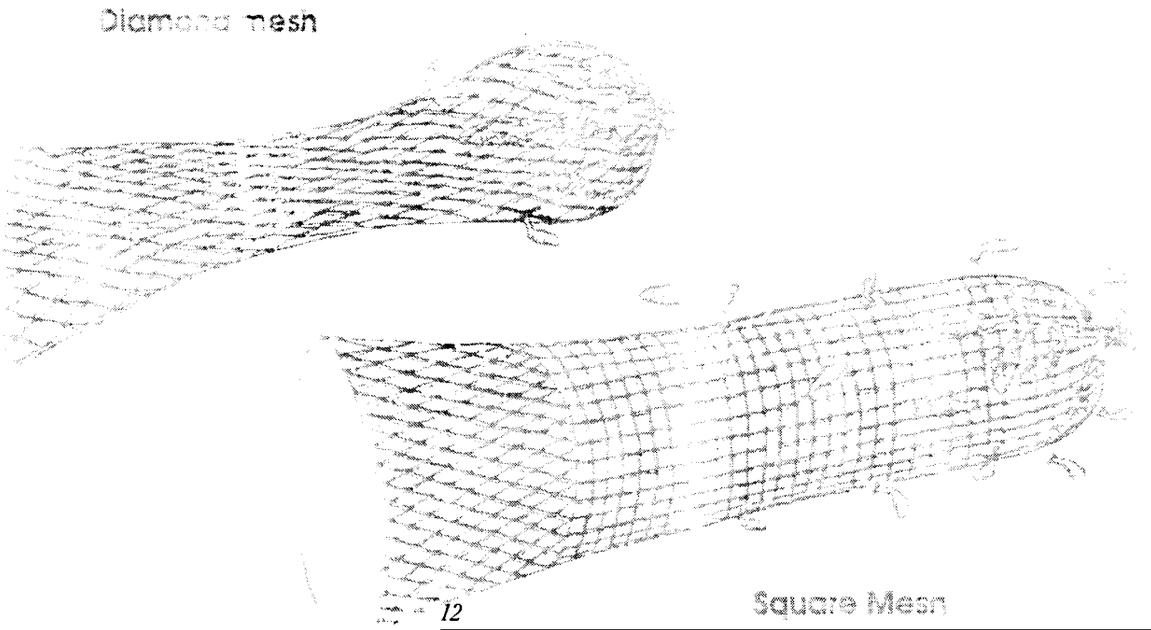
IV. VESSEL DESIGN INITIATIVES

The responsibility for vessel and gear design must be a shared one between government and industry and any design must be consistent with the requirements for sustainable fisheries development.

The 1991 Canadian Fishing Vessel Design and Optimization Workshop sponsored by the Canadian government focussed on the issues of technological development affecting modern fishing vessel design. Aimed primarily at the British Columbia fishing industry, it also included related developments on the Atlantic coast. Findings from the workshop emphasized that a balance must be struck between resource availability and harvesting capacity and in line with the concept of sustainable fisheries development.

In 1992, vessel design optimization work continued on the UBC "Expert System".

In 1991, Fisheries and Oceans sponsored an initiative in Yellowknife, NWT to establish northern fishing vessel requirements. Consultations and workshops were held in various centres in the North, including meetings with fishermen from Great Slave Lake, Inuvik and Rankin Inlet. Results of this work led to the proposal for the development of two vessels: a 26-foot skiff and a 36-foot transport vessel — each based on standard functional design requirements for good sea keeping, safety, energy efficiency, and catch quality maintenance.


Diamond mesh
Square Mesh

V. TECHNOLOGY TRANSFER AND TRAINING

Knowledge of the conditions and special needs of northern fishermen continue to grow. There is no doubt that technology transfer and training is an integral part of the complex task of developing fisheries in such a high risk environment.

TECHNOLOGY TRANSFER IN THE CANADIAN ARCTIC

The Department of Fisheries and Oceans sponsors a number of technology transfer workshops for Northwest Territory and Labrador (primarily, Inuit) fishermen.

Workshops in Nain, Labrador; Iqaluit, Yellowknife and Hay River, Northwest Territories defined a clear need for the training of Inuit fishermen in:

- vessel operation,
- fish harvesting, and
- fish processing in the Arctic.

Industry-driven recommendations, originating with northern fishermen, have resulted in several projects now being implemented by the Department of Fisheries and Oceans. These fall under two main categories:

1 TECHNOLOGY TRANSFER MODEL: SOUTH/ CENTRAL ARCTIC

Industrial training specialists from DFO and the Nova Scotia Department of Fisheries with considerable experience in conducting training programs for northern fishermen are developing a pilot training model for inshore commercial fishermen in the south-central Arctic.

In October 1992, an industry consultation was conducted in Hay River, NWT to determine training needs and to develop an industrial training/certification package initially for Great Slave Lake fishermen.

2 ARCTIC FISHERIES VESSEL DESIGN STUDY

In 1991, the Fisheries and Oceans undertook a preliminary feasibility study on the design of suitable vessels for use in developmental fisheries in the Arctic.

In 1992, two collector/test fishing boats for the Keewatin Arctic char fishery are being developed. The project involves identifying alternative uses for these vessels and the provision of full working drawings, specifications and bids for vessel construction.

In addition, technical advice was provided on the exploratory fishing initiative in coastal waters off Baffin Island. This initiative was conducted by the government of the Northwest Territories under a five-year cooperative agreement with the federal government.

VI. ASSESSMENT STUDIES

Strategies to meet the objectives of sustainable harvesting and responsible fishing can only be developed when the extent of problems are identified and opportunity for solutions investigated. To this end, Fishing Services Industry has embarked on a number of assessment studies.

A. LOST OR ABANDONED FISHING GEAR

Studies conducted by the Department of Fisheries and Oceans indicate that continued harvesting of fish by lost or abandoned gear is minimal in shallow water. However, nets in deep water continue to fish for two years or more. To determine the size and scope of this problem Fishing Industry Services launched an assessment of lost or abandoned gillnets. The 1992 project includes:

- gillnet losses and examination of crab pot ghosting
- identification of worst (most fouled) areas
- terms of reference for development of non-ghosting gear
- guidelines for possible new regulations
- assessment of gear marking technology
- an information/education strategy

B. FISH DUMPING AND DISCARDING

The dumping and discarding of fish leads to errors in catch statistics and potential damage to fragile stocks. Fishing Industry Services has launched a study to assess the causes and effects of dumping and discarding in various Atlantic fisheries. The 1992 project will:

- identify the fisheries in which dumping is considered a problem, and determine whether such practices are deliberate or unavoidable
- analyze regulatory and/or management measures which bear upon the issue
- assess implications of alternative methods to reduce such practices
- obtain industry input.

C. TECHNICAL HARVESTING

Fishing Industry Services has contracted a Montreal firm to identify environment friendly harvesting techniques which are the most selective and cost and energy efficient. Identification will include opportunities for the design, construction and operation of fishing gear, including the development and maintenance of a data collection and information management and transfer systems. Investigation of gear technology will take place across Canada and will include a number of consultations with technology experts in each region of the country.

D. Fishing Gear and Harvesting Technology

A review of all fishing gear and harvesting technology in Atlantic Canada will be conducted in 1993 by Fishing Industry Services in partnership with the fishing industry.

VII. TECHNICAL COORDINATION

Canadian fish capture initiatives are coordinated and reviewed by Atlantic, freshwater and Pacific technical working groups comprised of fishing industry representatives.

In 1993, it is projected that a Canadian Technical Fish Capture Working group will be formed to provide a national focus on fishing gear selectivity activities from the following:

ATLANTIC

In 1992 the Atlantic Technical Fish Capture Working Group was established to provide general technical advice to the Department of Fisheries and Oceans regarding the feasibility, implementation, coordination and review of fish capture initiatives within eastern Canada.

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