

## SESSION ELEVEN: REGIONAL APPROACHES TO FISHING SAFETY, II



*Port of Valdez, Alaska (Photo courtesy of Alan Sorum)*



# SAFETY AND SURVIVAL OF FISH WORKERS FOR MULTI-DAY FISHING CRAFT IN SRI LANKA

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## **Abstract**

This presentation discusses the role of policy change and injury surveillance to enhance work-related safety for commercial fishermen in Sri Lanka, whom we shall refer to using a local acronym, MDB, for groups of fish workers who use multi-day boats. Historically, the safety of commercial fishermen has not had a high priority in terms of policy enforcement. Poor fish workers are routinely hired for temporary work aboard vessels, and vessel owners do not consider the safety of these itinerant workers as a priority. The injury risks to these workers are very high, as these fishing vessels are at sea for longer periods, operating with very poor working facilities. Vessels often are missing first-aid boxes, and seldom would one find any medical supplies to treat workers. Safety equipment is usually missing as well. In addition to the lack of safety equipment and first-aid treatment aboard Sri Lanka's commercial fishing vessels, there is no proper reporting mechanism to notify authorities when injuries or fatalities occur. This presentation describes the need for on-going surveillance for commercial fishermen in Sri Lanka and then discusses the possible parties that could help create safer working conditions for fishermen there.

## **Introduction**

Sri Lanka is an island situated in the Indian Ocean with a 1,775-km-long coastline. All of Sri Lanka's populace lives within 100 km of the coastline. Fishing is very important to Sri Lanka's economy, as it provides employment, nutrition, and food security to the nation. Recently, the foreign exchange

earnings from fish products have grown in importance to the national economy. According to the reports of Ministry of Fisheries and Ocean Resources (MOFOR), the major contribution from marine fisheries production comes from the coastal fisheries. Deep sea commercial fisheries employing multi-day boats (MDBs) comprise around 25% of the total marine fish production of the country. Fisheries in offshore and deep-sea waters are composed primarily of medium-sized and large pelagic species, mainly tuna, and an exotic range of deep sea demersal species. Yellow-fin tuna, big-eye tuna, and skipjack tuna, all of which are highly migratory species, as well as sharks, are the major targets for MDBs. Around 1,500 MDBs work from Sri Lanka. A marked increase in fish production from offshore or deep-sea areas has occurred owing to the introduction of better-equipped MDBs. Production from the offshore and deep-sea sector increased from 800 metric tonnes in 1972 to 84,400 metric tonnes in 2000. The income distribution pattern of the small-scale and commercial fisheries in the country is shown in Table 1.

*Table 1: Multi-day craft in Sri Lanka*

Craft	Production, kg	Revenue, SLR
Multi-day boat	35,164	2,250,500
FRP boat	9,580	479,000
Motorized traditional craft	7,100	355,000
Nonmotorized traditional craft	800	41,000
Nonmotorized teppam	2,000	100,000
<i>Source: Comparative study on the economics of large- and small-scale fishing operations in Sri Lanka. Working paper NARA/SED/02/1998</i>		

### *Annual fish production and average revenue of fishing vessels*

The average net income of an MDB crew is higher than the income of other boat owners. The current value for an MDB is around SLR 4 million. (1 US \$ = 94 SLR)

### *Average cost of multi-day craft*

Comparative studies were undertaken at two major fishing harbours on the west and south coasts. Labour and other expenses for MDBs (Table 2) are rather higher than those associated with small-scale and artisanal fisheries in Sri Lanka. Table 3 shows average annual variable costs of craft operations of MDBs.

Table 2: Average cost of multi-day craft

Item	32 to 34 ft	34 to 36 ft	36 to 39 ft	Over 40 ft
Hull	475,000	650,000	750,000	1,550,000
Engine	400,000	450,000	450,000	1,200,000
Gear/accessories	425,000	520,000	700,000	1,250,000
Total	1,300,000	1,620,000	1,900,000	4,000,000

*Source: Economic and Social implications of multi-day fishing in Sri Lanka. O. Amarasinghe, Oct. 2001.*

Table 3: Average annual variable costs of multi-day craft

Item	32 to 34 ft	34 to 36 ft	36 to 39 ft	Over 40 ft
Labour	1,300,346	941,466	894,144	1,837,506
Fuel	521,854	455,143	621,450	720,652
Other inputs*	809,734	816,928	674,623	923, 752
Total	2,631,933	2,213,537	2,190,217	3,481,910

*\* Includes food, water, ice, maintenance, license fees, handling charges, payments for watchers at anchorage, cost of cleaning and loading, gate charges. etc.*

Drift gill nets and longlines are the main types of gear used in Sri Lankan fishing. A few troll lines are used. Generally, gear on MDBs consists of 50 pieces of drift gill nets, 100 longline baskets, and five to ten troll lines. Most of MDBs are equipped with navigational instruments such as radio transmitters and satellite navigators. Some of the MDBs have winches for net hauling.

Most MDBs sail more than 36 hours before actual fishing starts. Generally a fishing trip continues for 10 to 45 sea days, but 15- to 25-day trips are not unusual. It is important to note that the MDB owners are getting comparatively higher returns for their investment, but appear to pay inadequate attention to the safety of the fish workers. As stated earlier, safety of fish workers is not considered a high priority, possibly because most of the boat owners do not accompany fishermen to the sea. Owners employ temporary fish workers on their boats, usually managed by a skipper who is either a friend or a relative of the boat's owner. Employer-employee relations have undergone many changes with market expansion, population growth, and the advent of new technology. The crew is no longer employed on a permanent or long-term basis and move from one employer to another. Temporary job assignments for fish workers (who may be hired for only one fishing trip) weaken their bargaining power to improve working and safety conditions aboard the Sri Lankan fishing fleet (Table 4).

*Table 4: Crew data*

Catchment area	Classification by length	Crew compliment	Competency certificate holders
Coastal, offshore	Small fishing vessel, less than 12 m long	3-4	None
Offshore, deep sea	12-24 m long, propulsion less than 750 kW	Crew: 5; skipper: 1	None
Deep sea, high seas	24+ m long, propulsion 750 kW or more	Crew: 5; skipper: 1	None
Fishermen's log			None
Maintain log			None

Owners of MDBs expect the crew to work at sea until they catch the maximum amount of fish. Boat owners keep in touch with their boats through radio messages, informing the boat when to come back to shore in order to benefit from maximum income from the fish catch.

#### *Some sea safety issues related to multi-day fisheries industry*

An analysis of engines used in MDBs showed that 40% were reconditioned and had been chosen for economic reasons. But the durability of reconditioned engines is poor at times and can create risks for fishermen. Currently, no policy addresses the need for reliable engine power in the Sri Lankan fishing fleet. No Sri Lanka regulations exist to assess and document competencies for commercial fishermen. (Note the lack of certified commercial fishermen in Table 4.)

Sri Lankan fishermen often face unpredictable weather, unstable surfaces, and mechanical and flammable hazards. It is very important to report that the Sri Lankan MDBs operate all over the Indian Ocean, spending very long periods at sea and working in poorly equipped boats (Table 5). The lack of concern for fishermen's welfare forms a strong concern in fish worker organizations in Sri Lanka. Many Sri Lankan fishermen feel compelled to cross national borders to look for better working conditions. The situation is exacerbated when there is competition among commercial fishing fleets owned by foreign companies, which offer boats with sophisticated equipment, and MDBs operated by local fish workers, which offer very little in the way of amenities.

Table 5: Areas of operation and duration of voyages

	32 to 34 ft	34 to 36 ft	36 to 39 ft	Over 40 ft
Area of operation	EEZ	EEZ and international waters	EEZ and international waters	EEZ, internal waters, and territorial waters*
Duration of trip	1 week	1-3 weeks	1-3 weeks	3 weeks to 3 months
*Territorial waters include Andaman Islands, Nicobar Islands, Maldives, Australian Island, Bangladesh, Thailand, and Madagascar.				

Modern coastal fishing craft in Sri Lanka have been undergoing drastic changes in terms of construction materials, size and shape of hulls, deck layouts, and navigational accessories, but all these improvements have been introduced in piecemeal fashion. Stricter requirements should be implemented to improve minimum standards for working facilities on MDBs through new regulations attached to an MDB license. National requirements would go a long way to improve working conditions for Sri Lankan fishermen. Recently MOFOR provided first-aid boxes to many MDBs that lacked this box, which is a very important piece of equipment on any commercial fishing vessel. As we assessed safety equipment aboard some of the MDBs we encountered, many of the crew said that there was a first-aid box on their vessel but no medicine. Furthermore, the crew had no idea how to identify or use what little medicine might be found. MOFOR thus suggests that there should be on-going training to educate fish workers on health, first aid, sea safety, and survival.

### *Need for standard safety devices and mechanisms*

Sri Lankan fishermen have said that most of the standard safety devices are not affordable for the crews of fishing vessels. MOFOR notes that in spot checks, it has seldom found safety devices aboard fishing vessels. Absence of effective search-and-rescue or any other emergency equipment has also been noted; the lack of this equipment increases risks of danger at sea. Sri Lanka lacks the capacity for swift rescue of stranded fishing vessels. Thus, it is important for Sri Lanka to develop a systematic, shore-based system to log departure times, estimate time or dates of arrival, and possible destinations against vessel numbers to facilitate search-and-rescue missions.



### ***Rough weather conditions at sea***

Since Sri Lanka is located in the equatorial region, its fishing grounds spread across a number of major surface current systems. Moreover, these fishing grounds are strongly influenced by northeast-southwest monsoon weather conditions, with very strong winds that blow in opposite directions. The number of fishing boats drifting in the open sea because of engine failure, navigational difficulties, or fuel shortage remains high, particularly among MDBs, and each of these drifting vessels is at the mercy of harsh weather. Drifting and lost MDBs compose a major problem for the Sri Lankan government. Some boats have been larger ocean-going vessels sailing in the area.

### ***Threat of capture and detainment in neighbouring countries***

Another major safety issue at present that impacts Sri Lankan fishermen is the threat of capture, arrest, or conflict at sea. The number of fishing craft captured and the number of Sri Lankan crew members detained in foreign jails has increased drastically during the past years. Some Sri Lankan MDBs have been captured by various countries in the neighbouring Indian Ocean. The civil war in the north and east of Sri Lanka has also created threats to the lives of the fish workers on board both artisanal craft and MDBs. The problems associated with civil unrest are now 20 years old and continue to affect the safety of Sri Lankan fishermen.

## **Conclusion**

It is very important to the Sri Lankan fishing community that the various UN agencies have taken important steps to improve working conditions and safety at sea for commercial fishermen around the world. As national governments ratify these policies, concrete measures can be taken to improve safety for fishermen. We especially acknowledge the importance of the following:

- ✦ Code of Conduct for Responsible Fisheries, by FAO in 1995.
- ✦ ILO Instruments on Fisheries Sector. Five conventions and two recommendations apply to persons working on fishing vessels. The existing conventions concern minimum age, medical examinations, articles of agreement, accommodations, competency certificates, vocational training, and hours of work.
- ✦ Bay of Bengal Programme's Chennai declaration.



Although it is focused on small-scale and artisanal fishermen's sea safety, the Chennai declaration is very important for addressing safety issues for sea-going fishers.

## References

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# SRI LANKAN FISHING INDUSTRY AND SAFETY AT SEA

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## **Abstract**

Commercial fishing is one of the most important sectors in the economy of the island of Sri Lanka, providing direct and indirect employment to around 250,000 persons. The sector also contributes nearly 3% to the Gross Domestic Product of the country and provides the bulk of the animal protein consumed by the population. During the past two decades, fishing activities have been extended from the area within the continental shelf up to the edge of the 200-mile Exclusive Economic Zone (EEZ) and beyond. The mechanization programme has resulted in a motorized fishing fleet of nearly 14,000 vessels. The larger boats operate on a multi-day basis and fish in offshore areas. Although Sri Lanka has a 200-mile EEZ, its full potential is yet to be realized. In the meantime, frequent reports are heard that foreign vessels enter the EEZ, carry out illegal fishing, and damage fishing nets of the local boats. The present Coast Guard service is unable to carry out any effective monitoring, control, and surveillance (MCS), and Sri Lanka is now in the process of attempting to build a cost-effective MCS system for this purpose.

## **Introduction**

The island Republic of Sri Lanka is located in the Indian Ocean southeast of India between 5°55' and 9°51'N latitude and 79°4' and 81°53'E longitude. Its area is approximately 65,610 sq km, with a coastline of about 1,620 km, Sri Lanka and the southern tip of India stand on the same continental shelf and are separated by the shallow Palk Strait, which is barely 30 metres deep.

Sri Lanka's Maritime Zones Law No. 22 of 1976, proclaims several areas of national maritime jurisdiction in conformity with the provisions of the UN Convention on the Law of the Sea, namely "Internal Waters," "Historic Waters," "Contiguous Zone," and the "Exclusive Economic Zone." The area enclosed by the Exclusive Economic Zone (EEZ) is reported as 517,000 sq km, 7.8 times the total land area of the country.

Over the last five decades, the fisheries sector of Sri Lanka has undergone a significant transformation, resulting in the modernization of an artisan fishery that was previously exclusively based on the use of rudimentary craft, fishing methods, and gear. While the fishing fleet of the early 1950s was made up only of traditional craft, such as dugout canoes (*oru*, *wallam*) and log craft (*teppam*, *kattumaram*), by the year 2002, the number of traditional boats totaled 16,376, or only 58% of the 28,135 vessels making up the entire fleet. The remaining 42%, numbering 11,759, are modern fishing boats made out of timber or fibre-reinforced plastic and powered by inboard and out-board engines.

Concomitantly, there has also been a similar change in the types of fishing nets and gear used. In the early 1950s, the most important fishing method was beach seining (*madel*), reported to have accounted for almost 40% of the total marine fish landings. Today, however, beach seining has paled in significance, and its contribution to overall production is rather marginal. Gill netting is now the most important fishing method in terms of the contribution made to production. In addition, the nets and gear that were made locally of vegetable fibres have given way to those made out of such synthetic fibres as nylon and kuralon. These changes were brought about through a massive extension effort launched by the Department of Fisheries with the technical and financial assistance of the Food and Agriculture Organisation and several donor countries and organizations. As a result of this modernization, landings of marine fish have increased from 51,000 metric tons in 1960 to 303,000 metric tons in 2002, nearly a six-fold increase.

In addition, gradual growth in inland fisheries production in Sri Lanka reached its climax in the late 1980s. This was brought about by a programme of stocking of large inland water bodies with fish and was supplemented by an increased harvesting effort made possible through the issue of subsidized craft and gear among the communities near these stocked bodies of water. The overall result was a very substantial increase in national fish landings, from around 1,500 metric tons in 1960 to 39,720 metric tons by 1989, an

increase of nearly 26 times within just three decades. However, due to a fundamental change in government policy in the late 1990s that resulted in the withdrawal of government support for inland fisheries, a downward trend in inland fish production is seen from 1990 to 1998. Thereafter, inland fish production picked up once again, and by 2000, it had reached 28,000 metric tons.

Due to these impressive increases in marine and inland fish production, it has been possible to increase the per capita availability of fish from a level of 11 kilograms in 1978 to 18.5 kilograms in 2002. The rural population has benefited considerably in terms of better availability of fish due both to better transport of marine fish into the hinterlands and to increased production of freshwater fish.

## **Fisheries sector in the national economy**

Fishing has been a major economic activity on the island from time immemorial, and it has been the main livelihood of large numbers of coastal dwellers. Since Sri Lanka's political independence in 1948, successive governments have increasingly devoted attention to fisheries development and have carried out many programmes for the advancement of the industry. A significant characteristic of the fishing industry in Sri Lanka is that it has always been dominated by the private sector, although not the formal private sector. Except for a handful of boats owned by a few fisheries' co-operative societies or by a few companies, the rest of the fishing boats and gear deployed in the industry are owned and operated by thousands of individual fishermen, family units, or informal groups. The role of the government in these circumstances has been one of facilitation, promotion, encouragement, and regulation of activities in the national interest.

The fishing industry plays a major role in providing animal-based protein, an important element of the diet of the Sri Lankan population. According to the Food Balance Sheets from the Department of Census and Statistics, fish has consistently contributed around 65% of the animal-based protein intake of the population. In addition, it is also noteworthy that in Sri Lanka, with a multireligious and multiethnic society, numerous religious and cultural biases and prejudices prevail against the consumption of animal flesh. However, fish is the item preferred by most and hence is always in great demand.

Fishing has been the most important economic activity in the coastal areas of the country, and it is estimated that, at present, nearly 150,000 persons are directly employed in the fishing industry, including inland fishing. An additional 100,000 persons are estimated to be employed in several fishery-related economic activities, such as boat building; fish net manufacturing; ice production; processing, trading and marketing of fish; and in providing other services required by the industry, such as transport, repair of engines, and hull work. It is also estimated that there are nearly 1,250,000 persons, including the dependents of the industry participants, who derive their sustenance from the industry. Its contribution to the Gross National Product has stood around 2% in the past few years.

In recent years, the fisheries sector has also emerged as an important source of foreign exchange through the exports of several items of high-value fish and fishery products, including chilled and frozen tuna, shrimp, lobsters, shark fins, and sea cucumbers. Starting from humble beginnings in the late 1970s, the total value of fishery-based exports has been continuously on the increase, reaching a level of Rs. 8,047 million (US \$83 million) in 2002.

Sri Lanka's coastal fishery resources are made up of the exploitable pelagic and demersal marine species of the entire water column on the continental shelf. About 70% of the exploitable coastal resources consist of small pelagics, such as sardines, herring, anchovies, mackerel, and flying fish. Oceanic large pelagics, such as tuna, marlin, shark, sailfish, and swordfish, are also caught in the coastal waters of the country. The common oceanic pelagics are the yellow-fin tuna (*Thunnus albacares*), skipjack (*Katsowonus pelamis*), Kawa-Kawa (*Euthyus affinis*), frigate tuna (*Auxis spp*), and seer fish (*Scomberomorus commersoni*). Demersal species caught include emperors, snappers, groupers, sweetlips, sciaenids, carangids, breams, goatfishes, and leiognathids, as well as invertebrates such as squid, prawns, crabs, and lobsters. The commercially important food fishes caught in the coral reefs are the groupers, snappers, emperor fishes, rabbitfishes, sweetlips, surgeonfishes, parrotfishes, and barracudas. Important invertebrates caught are spiny lobsters (*Panulirus versicolor* and *P. Ornatus*), octopus, sea cucumbers, squid, and cuttlefish. Many other species are exploited for the ornamental fish industry; these include butterfly fish, surgeon fish, blennies, dragonets, gobies, wrasses, file fish, angelfish, and damselflies, among others.

Since production from the coastal sector has almost reached optimum levels, any further increase in marine fish production is largely dependent on the

exploitation of resources in offshore areas. The offshore fishery targeting migratory stocks of tuna, billfish, and other deep water species was the fastest growing sector in the marine fishing industry during the last decade.

### *Catch and effort*

Sri Lanka's current marine fishing fleet consists of a little over 28,000 craft of several types. Despite the implementation of a series of development programmes for the modernization of the industry, supported by technical and financial assistance from the international community, Sri Lanka's fishing fleet still retains much of its artisanal and traditional character. Even now, 59% of the total fishing craft of Sri Lanka are of the indigenous, traditional type. The most important development in the fishing industry during the past two decades was that fishing activities by the local fishing fleet have extended into areas outside the continental shelf. This was made possible by the design and the introduction of new types of fishing boats. These newer, larger boats have the capability of fishing continuously over several days, primarily due to the installation of an insulated fish hold, better facilities for the crew, and the capacity to take more fuel and water. These boats, called multi-day boats, have enabled the country to harvest commercially valuable large tuna and other resources found in the outer fringes of the EEZ of Sri Lanka. It is also noteworthy that, at least in the initial stages of its development, multi-day fishing activities were actively promoted by the government through schemes of subsidies and credit just as much as the initial craft mechanization programmes were promoted through government efforts.

With regard to fishing methods and gear, the most noteworthy feature is that gill netting is the most important fishing method in terms of production. In the coastal fisheries, small-mesh gill nets are used in the exploitation of small pelagic fish. This method accounts for around 80% of the landings of these varieties. Beach seines account for the balance. Gill nets of 60- to 80-millimetre mesh size are the main gear utilized for the medium-sized pelagics, such as small tuna varieties and Indian mackerel. The large gill net is used predominantly in taking larger pelagics, including skipjack, yellow-fin tuna, and Spanish mackerel. Longlining is the next most important gear and takes two forms, tuna longlining and shark longlining.

As already mentioned, marine fish production has recorded a steady overall increase during the past 25 years, except for a decline in 1984 due to the civil disturbance in the northern and eastern parts of the country. Coastal fish production showed a 0.9% increase per annum between 1978 and 1986, and



then declined to an annual growth rate of 0.23% between 1987 and 1997. Production from this subsector peaked in 2002 and reached 176,250 metric tons in that year. There has also been a continuous increase in offshore fish production in the recent past. Overall, the increase in production in the 1990s could be attributed to the introduction of more efficient engines and more reliable fishing craft, enabling the expansion of fishing from the traditional fishing grounds in lagoons, estuaries, and inshore waters toward the oceanic waters offshore. Table 1 shows the past trends in marine fish production in Sri Lanka.

More than 15 fishery resource surveys have been conducted in Sri Lanka since 1920, mostly on pelagic resources. Because the surveys were not followed by reliable statistical data collection, it is not possible to conclude if the maximum sustainable yield has already been attained. There are indications, however, that, with the exception of a few fish stocks, the harvest in the country's coastal waters has already reached its optimum level, and some stocks have already manifested signs of overexploitation. Small-scale fishers report decreasing sizes of fish and lower catch volumes with greater fishing effort. In this light, the Ministry has adopted a "precautionary approach" in regard to its development policies.

Table 1: Fish production in Sri Lanka

Year	Coastal fish production	Offshore fish production	Total marine fish production
1997	152,750	62,000	214,750
1998	166,700	73,250	239,952
1999	171,950	76,500	248,450
2000	179,280	84,400	263,680
2001	167,530	87,360	254,890
2002	176,250	98,510	274,760

### *Policy framework*

No clearly articulated and separately documented set of policies pertaining to fisheries and aquaculture was produced until 2002. However, the evolution of policy thrust areas could be identified in terms of fisheries development plans formulated between 1959 and 2002. There have been several planning cycles, starting with the 10-year plan of 1950 formulated by the National Planning Council. The five-year plan of 1972-1976, formulated by the Ministry of Planning and Employment, followed it. Subsequently, four more development plans were formulated by the Ministry of Fisheries.

- ✦ Fisheries Master Plan, 1979-1973
- ✦ National Fisheries Development Plan, 1990-1994
- ✦ National Fisheries Development Plan, 1995-2000
- ✦ Six-Year Fisheries Development Programme, 1999-2004.

Current fisheries policy is clearly laid down in the National Fisheries Policy and the Development Plan, formulated in 2002 by the Ministry of Fisheries and Ocean Resources (MFOR). The main elements of the policy are stated below.

1. MFOR is committed to performing the principles of “responsible fishing” and will create the necessary awareness and management programs to achieve this purpose. Stakeholder involvement in the management of fisheries is a key policy objective.
2. A reliable database producing meaningful information to support the applications of proper fisheries management initiatives will be developed.
3. The Fisheries and Aquatic Resources Act and other laws and regulations made thereunder will be revised to facilitate effective fisheries management and community participation to prevent harmful fishing practices and to ensure the conservation of resources and sustainable fisheries.
4. Coastal, lagoon, and inland fisheries will be developed and sustained primarily to provide the communities associated with them with nutritious food security, livelihoods, and income-earning opportunities. MFOR will, through its agencies, provide or facilitate the delivery of requisite inputs, including management systems, that enable the above purposes in an equitable and sustainable manner.
5. A high priority will be accorded to the conduct of resources surveys, stock assessments, and exploratory fishing to build the information base relating to fish resources in coastal, offshore, and deep sea areas.
6. MFOR will take measures to improve productivity in the fishing industry through the introduction of appropriate and advanced technologies in catching, processing, and marketing fish and fishery products.
7. MFOR will prevent the use of fishing practices that are destructive to the resource and fish habitat, particularly the use of dynamite and stupefying substances, through awareness programs, effective surveillance, and stringent enforcement of laws. The existing laws will be revised to deter such activities.

8. MFOR will also actively support the diversification of fishing methods to lessen the reliance on gill netting, as well as to lessen the incidence of resource- and environment-damaging fishing practices, and to promote the harvesting of underexploited and unexploited resources. A commission headed by a retired judge, with powers to call for public hearings and expert evidence and to consult communities, will be appointed to determine the fishing methods that should be disallowed.

### *Legal Framework*

The Fisheries and Aquatic Resources Act No. 2 of 1996 provides the legislative framework for development and management in Sri Lanka. The act came into operation in 1996 and replaced the fisheries ordinance of 1940, which had been amended several times between 1950 and 1979. The current act provides for the management, regulation, conservation, and development of fisheries and aquatic resources of Sri Lanka. Furthermore, it provides for the following:

- ✦ Appointment of offices, including authorized officers and their powers.
- ✦ Establishment of a fisheries and aquatic resources advisory council.
- ✦ Preparation of a plan for the management, regulation, conservation, and development of fisheries and aquatic resources.
- ✦ Licensing of fishing operations.
- ✦ Registration of local fishing boats.
- ✦ Protection of fish and other aquatic resources.
- ✦ Conservation.
- ✦ Aquaculture.
- ✦ Citations and penalties.

It is proposed to replace the current Fisheries and Aquatic Resources Act by a new act formulated by foreign and local legal experts with the assistance of the Asian Development Bank to ensure that the national fisheries policy can be implemented effectively and that management and development objectives are achieved. The key features of the draft fisheries management and development bill are to—

- ✦ Provide a comprehensive, integrated framework for managing and developing the fisheries resources for the benefit of the people of Sri Lanka.

- ✦ Include institutional reforms initiated by this government to support the management and development functions and enable participatory management.
- ✦ Implement Sri Lanka's international obligations to provide a clear basis for foreign fishing and related activities in Sri Lanka waters.
- ✦ Cover a range of activities, including fishing, landing of fish by foreign fishing vessels, operating fish processing facilities, commercial test fishing, and manufacturing fishing boats and fishing gear.
- ✦ Provide a framework for a clear, transparent licensing and registration system to ensure that the fisheries resources will continue to yield maximum benefits to the people of Sri Lanka.
- ✦ Incorporate clear powers of officers and inspectors for monitoring controlled surveillance, including the use of cameras, position-fixing instruments, and other up-to-date technologies.
- ✦ Provide an innovative and straightforward dispute resolution process.
- ✦ Clarify the roles of the courts and legal procedures to enable clear and efficient enforcement.



# THE ALASKA FISHERMEN'S FUND

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## Introduction

Commercial fishermen and women face a variety of hazards in their work. The financial consequences of injuries or medical conditions that arise on the job are not always met by the Social Security network. The State of Alaska is unique in the nation by providing its commercial fishermen and women a program that offers some relief and security if they are injured or become ill while engaged in their jobs. Under federal laws such as the Jones Act, owners of documented vessels have specific obligations with respect to injured crew members. On undocumented vessels, these regulations do not apply to the vessel owner or to the crew.

## Purpose

The State of Alaska, through its Department of Labor and Workforce Development, administers a program that provides for the treatment and care of Alaska licensed commercial fishermen who have been injured while fishing in the state. The Alaska Territorial Legislature established the Fishermen's Fund in 1951 to help meet the medical needs of men and women in the commercial fishing industry. When Alaska became a state in 1959, the Fishermen's Fund was incorporated into statute (State of Alaska, Alaska Administrative Code [ACC], Title 23), and its operations and limitations described under the ACC (State of Alaska, AAC, Chapter 55). Because this dedicated Fund predates statehood, it has unique status compared with the financing of most Alaskan government entities. This paper will describe the Alaska Fishermen's Fund program and cite the benefits it has provided.

## Methods and Description

Benefits from the Fund are financed from revenue received from each resident and nonresident commercial fisherman's license and fishery permit fee. Table 1 shows how receipts were generated for fiscal year 2003 (July 1, 2002-June 30, 2003) from the sales of licenses and permits. At the current time, 39%, or \$23.40, of the resident crew license fee (\$60) and \$50 of a nonresident crew license fee (\$180) are deposited in the Fund. Similar amounts come out of fishery permit fees. Since these amounts are collected by the Alaska Department of Fish and Game, there is an interagency relationship at work.

*Table 1: Receipts for Fund, fiscal year 2003*

Licenses sold during FY03				
Resident	9,393	39% X	\$60 license fee	\$219,796
Nonresident	7,061	\$50 X	\$180 license fee	\$353,050
Duplicate	571	39% X	\$5 license fee	\$1,113
Child	348	39% X	\$5 liense fee	\$1,740
Nonresident child	48	39% X	\$125 license fee	\$2,340
Total	17,421			
Permits issued during FY03				
Resident	9,892	X 23.40		\$231,473
Resident poverty		X 23.40		
Nonresident	3,486	X 50		\$174,300
Nonresident poverty		X 50		
Total	13,378			
<b>Total receipts</b>				<b>\$983,812</b>

The balance in the Fishermen's Fund has varied over the years, depending on the relationship of receipts, benefits paid, and administrative expenses. (For the period July 1, 1989–June 30, 2003 [FY1990-2003] see Tables 2 and 3.) The Fund is self-sustaining and currently has a positive balance of over \$11 million. It is interesting to note that with the recent downturn in many aspects of the Alaska commercial fishing industry, there has been a drop in the number of licenses and permits sold over the past 14 years (Table 4). As a result, the Fund anticipates reduced revenues in the future. With fewer participants, there could be a drop in the total number of claims as well.

According to Alaska statutes, except for compelling reasons, the total benefit allowed for any one injury or accident is \$2,500. Fishermen's Fund is considered an emergency fund of last resort, which means that benefits are awarded



Table 2: Overview of receipts and number of claims

Year	Receipts	Funds available at year's end	No. of claims
FY90	1,545,300	3,382,500	2,101
FY91	1,651,400	3,381,900	1,943
FY92	1,599,300	4,891,200	1,787
FY93	1,492,400	5,808,500	1,538
FY94	1,494,600	6,580,500	1,405
FY95	1,272,500	7,367,700	1,237
FY96	1,556,700	8,305,400	1,002
FY97	1,232,900	9,484,800	946
FY98	1,146,900	9,657,834	816
FY99	1,196,703	10,495,242	806
FY00	1,196,999	10,729,131	856
FY01	1,182,554	11,447,962	786
FY02	1,079,755	11,717,248	808
FY03	983,946	11,815,543	696

Table 2: Overview of benefits paid and expenses

Year	Benefits paid	Administrative expenses	Total expenses	Revenue
FY90	644,400	163,300	807,700	1,545,300
FY91	593,300	168,000	761,300	1,651,400
FY92	593,900	172,900	766,800	1,599,300
FY93	493,400	243,700	737,100	1,492,400
FY94	445,700	222,900	668,600	1,494,600
FY95	339,400	206,000	545,400	1,272,500
FY96	290,200	187,100	477,300	1,556,700
FY97	447,500	188,500	636,000	1,232,900
FY98	399,967	198,982	598,949	1,146,900
FY99	597,542	211,576	809,118	1,196,703
FY00	497,998	201,748	699,746	1,196,999
FY01	531,366	211,964	743,330	1,182,554
FY02	584,408	223,565	807,973	1,079,755
FY03	584,408	223,565	807,973	983,946

only after full consideration of other coverage from private health or vessel insurance and public programs such as Veteran's Affairs or Medicare. The only exception to this payer of last resort is the Medicaid program, where the Fund pays first. Generally there is a 1-year limit from the date of claim approval for the claimant to complete his or her part of the process.

Table 4: Licenses and permits issued by Alaska

Year	Licenses	Permits*	Total
2003	17,422	20,002	37,424
2002	17,574	21,625	39,199
2001	20,653	23,456	44,109
2000	24,290	24,660	48,950
1999	25,060	25,292	50,352
1998	24,916	26,214	51,130
1997	27,238	27,512	54,750
1996	28,752	27,452	56,204
1995	31,391	27,731	59,122
1994	32,310	29,150	61,460
1993	33,011	29,861	62,872
1992	36,166	32,588	68,754
1991	36,390	32,798	69,188
1990	36,992	32,508	69,500
Total			773,014
*Active issued and renewed permits (not people) as of August 14, 2003.			

The organizational structure of the Fund is straightforward. The Commissioner of Labor and Workforce Development oversees administration of the program with the assistance of the five members of the Fishermen's Fund Advisory and Appeals Council. The council is composed of the commissioner or his designee who serves as chairperson and five representatives from the fishing industry appointed by the governor for 5-year terms. The Council meets twice a year to review questioned claims, consider extensions of benefits and time, advise on policy, and conduct other business.

The day-to-day operations occur in the state capital in Juneau, Alaska, and are overseen by the fund administrator. This person writes and administers the budget, sets policy, prepares reports for the legislature, troubleshoots claims, and communicates with care providers and industry through an awareness program. The administrator supervises two Workers' Compensation technicians who process and evaluate claims, answer phone and e-mail inquiries, and pay bills. The council and staff seek to serve injured commercial fishermen effectively, to process claims quickly and efficiently, and to pay care providers in a timely fashion.

To qualify for benefits, crew members or skippers with an injury or illness directly connected to operations as a commercial fisherman must hold a valid commercial fishing license or limited entry permit issued by the state of

Alaska before the time of injury or illness. The onset of the injury or illness must be onshore in Alaska or on Alaska waters. Initial treatment must be received within 60 days of the onset of the injury or illness. An application must be submitted within 1 year after the initial treatment. Each treatment must be documented by submission of a physician's or physician's assistant's medical chart notes. It should be noted that persons holding a recreational fishing license and working on charter fishing boats are not covered. Similarly a worker who is directly connected to a seafood processing operation does not qualify for Fund benefits, but may be covered under the Workers' Compensation program.

Costs related to medical care, hospitalization, prescriptions, therapy, and transportation will be paid when an occupational injury or illness is "directly connected with operations as a commercial fisherman" in Alaska waters or on shore preparing or dismantling boats or gear used in commercial fishing. In addition to the expected cuts, sprains, and fractures, other examples of covered conditions are hernias, arthritis, and traumatic sciatica. Bronchitis, pneumonia, and pleurisy caused by or aggravated by the fishing activity are also included.

By statute, certain conditions are generally not covered—for example, the common cold, flu, cancer, appendicitis, or smoking-related conditions. Quite specifically, recreational drug or alcohol-related injuries are excluded from coverage. Conditions caused by not following good hygiene and health practices or improper care are not covered.

The Fishermen's Fund report is considered the fisherman's claim form or application for Fund benefits. When signed and dated, it is considered an affidavit attesting to the validity of the claim. When properly filled out and submitted with requested materials, such as a copy of the crew member's license, Fund staff can very quickly process the claim and reimburse the fisherman or pay the care provider. In FY 2003, 696 claims were submitted (Table 5). Approximately two-thirds (389) of all approved claims (583) were approved the same day as received by office staff.

In general, the most common delay in the approval process is waiting for an explanation of benefits from an insurance company to document why a claim is not covered by other insurance policies. This quite often causes approval delays of 150 days. Recall that the Fund is considered an emergency fund that is the payer of last resort. When the administrator cannot approve an

*Table 5 : Outcome of claims*

Approved claims	583
Claims approved by council	7
Pending claims	16
Claims pending council	25
Claims paid by primary insurance	14
Claims to payer of last resort	12
Withdrawn claims	3
Claims denied by council	33
Miscellaneous	3
Total	696

application for benefits, it must go before the Advisory and Appeals Council for review, then denial or approval. Common reasons for delays that require council review include no evidence of a license at the time of injury or illness, no response to inquiries from the staff about items on the application, or not related or connected to the operations of a commercial fisherman in Alaska.

Health care providers can be very helpful in the paperwork process and often file on behalf of the individual after obtaining proper information and signatures. Since they are the ones usually owed for services, it is to their advantage to understand the system. Ultimately, it is the injured party who is receiving treatment who is responsible for payment. An awareness program by the Fund administrator has sought to make the claims process more easily understood by the staff of various hospitals and clinics. Applications and information brochures are sent out annually to providers. Individuals can talk directly with staff via a toll-free phone line. A Web site (<http://www.labor.state.ak.us/wc/ffund.htm>) and e-mail ([FishFund@labor.state.ak.us](mailto:FishFund@labor.state.ak.us)) are additional means of communication. At the present time, applications and documentation must be submitted as hard copy, but forms are available on-line.

## Results

Table 6 shows the claims filed by gear type and fishing district for fiscal year 2003. These data are gathered from the application and point out several things. Nearly all of the salmon caught commercially in Alaska are taken with gill nets, seines, and trolling gear. Collectively, the salmon fisheries employ the largest number of persons in the commercial fishing fleet. As one

Table 6: Claims by gear type and district

Gear type	Fishing district					District unknown	No. of claims
	1	2	3	4	5		
Gill net	6	21	74	58	4	2	165
Seine	29	32	35	2	3	2	103
Troll	13	32	4	1	0	1	51
Pots	18	26	37	7	5	0	93
Trawl	2	6	18	1	0	0	27
Longline	15	34	85	13	4	4	155
Not stated	24	15	36	14	6	5	102*
Total							696
* Two were not from Alaska							

would suspect, they account for the largest number of claims to the Fund, and these most often occur in the summer months. With a longer season, longliners have more exposure and show claims in their most significant areas of operation. District 5, including areas in western and northwest Alaska, has relatively few commercial fisheries and participants and thus shows very few claims. Subsistence use of fishery resources is very high in this area, but this activity is not covered by the Fund.

From the statistical point of view, Fishermen's Fund injury data are far from comprehensive and complete. First, not everyone who is injured during commercial fishing operations files a claim with the Fund. Some know their own personal health insurance will cover the cost. Others have coverage provided by the Indian Health Service, Veterans' Affairs, or the federal Medicare program. Some individuals and their health care providers are unaware of the program.

If a serious injury occurs that exceeds the standard \$2,500 amount paid by the fund, the owner of a vessel usually files a claim directly with his vessel's Protection and Indemnity (P&I) insurance policy. The Fund does not pay the typical \$2,500 or \$5,000 deductible on these policies. On the other hand, the owner-operator of a vessel is typically excluded from a vessel's P&I policy and is likely to file with the Fund. Operators that choose not to have P&I insurance on their crew would be likely to encourage them to file with the Fund.

Data collection by the National Institute for Occupational Safety and Health

(NIOSH) at its Anchorage field office indicate that very serious accidents in Alaska are best documented through the Alaska Trauma Registry (Simonsen 1994). Significant admissions to emergency rooms and hospitals around the state are indicated on this registry and identify some of the occupational circumstances associated with the injury. For example, some of the serious crushing injuries that have occurred in the crab fisheries in the Bering Sea show up on this registry and never appear as Fishermen's Fund claims. The large and expensive distant water vessels are well insured, anticipating large medical bills, and potential lawsuits go directly to their insurance companies.

While the raw data covering injury and illness claims to the Fund cover a period of more than 50 years, they are not statistically complete to properly represent the spectrum of injuries and illnesses that befall those in Alaska's commercial fisheries. Especially in recent years, with the escalating costs of health care in the United States, there is more likelihood of minor events being heavily represented in the data to the exclusion of more significant events. Still, for anecdotal evidence of the nature of injuries and illnesses, the data can point to problems that often happen to those working on fishing boats. For example, lacerations caused by knives used to clean fish or mend nets are common. Slips and falls that occur on the same level, resulting in sprains or contusions would be expected on rolling, slippery decks. Again, because of the motion of the ocean and the heavy nature of much of the work on deck, overexertion injuries, strains, and sprains are common. Bodily reaction injuries, e.g., from bending repeatedly or slipping without falling, are common. Interestingly, according to the annual Workplace Safety Index compiled by Liberty Mutual (North Pacific Fishing Vessel Owner's Association 2003), these injury causes accounted for 51% of workers' compensation direct costs in 2000 for all workplace injuries nationwide. So perhaps while not as dramatic as an amputation, the cumulative numbers represented by these types of injuries become very expensive in the long run. In the short term they are certainly disruptive to the work on a vessel, often causing an unwanted trip to port and a loss of productivity. Needless to say, the problems for the individual injured should never be minimized.

To illustrate how the Fishermen's Fund helps individuals, let me present a typical example. While pulling in gill net gear, crewman Bob Brown's finger gets tangled and dislocated. The captain pulls into port, and Bob goes to the emergency room to get the finger x-rayed. The doctor says the finger is not broken, just dislocated, tapes it up, and sends Bob back to the boat.

The bill is \$300 for the emergency room visit, \$150 for the x-ray, and \$200 for the doctor's fees, for a total of \$650. Under the Jones Act, the captain, John Smith, is responsible for the payment of the injury. He informs the hospital that the Fishermen's Fund will pay for the injury. The hospital has Bob Brown fill out the Fishermen's Fund claim form, and the physician fills out his portion. A copy of Bob's crew license, the medical bills, and chart notes are attached and mailed to Fishermen's Fund.

Fishermen's Fund receives the paperwork. That day they validate the license and review the claim for missing information and eligibility. If everything is there, the claim is approved for payment. Information is entered into the computer, and a payment request is sent to the fiscal department. Bob Brown's medical bills are paid, the captain is off the hook for payment, and P&I insurance is not held liable.

At times the care and treatment of a person's injury or disability extends beyond 1 year from the date of initial allowance. Furthermore, in today's world of high medical costs, bills may quickly exceed the \$2500 originally specified in the 1951 law creating the Fund. Individuals have the right to request in writing an extension of the time and/or the benefit limits. They must give compelling reasons for justifying the request and cite the "amount of relief" and "the extent of additional time" required (Fishermen's Fund). The Council reviews information submitted by the fisherman on his or her financial status. It also considers the impact of the injury or illness on the fisherman's ability to earn a living while undergoing treatment and to continue to earn a living as a commercial fisherman. Each case is carefully considered by the Council, and a decision is delivered to the individual. All decisions of the Council may be appealed to the Commissioner of Labor and Work Force Development if the claimant feels he or she has not been treated fairly.

The following examples will illustrate the benefits of this provision.

(1) On the last set of the day, the captain is helping the crew pull in seine gear. His arm gets entangled in the deck winch and is severely dislocated. The crew immediately heads to port and takes the captain to the hospital. The doctor looks over the captain and suggests shoulder surgery in the next few days.

The captain is off work for 2 weeks while he is recovering from surgery and beginning physical therapy. His bills are running somewhere around



\$15,000, and he has not been able to finish the fishing season. His P&I insurance only covers the crew and not him. He has no personal medical insurance.

He requests that the hospital submit the claim to the Fishermen's Fund. Fishermen's Fund receives the claim and verifies the valid permit and that the injury was directly related to commercial fishing. Fishermen's Fund pays to the \$2,500 limit and mails a letter to the vessel owner asking if he would like to apply for an extension of benefits.

The vessel owner fills out additional paperwork and submits it to Fishermen's Fund. Fishermen's Fund Advisory and Appeals Council reviews the claim, deliberates on the case, and approves the \$12,500 extension. Medical bills are paid, the vessel owner is healed, and he is not in debt with the hospital.

(2) One woman, also an owner-operator, suffered an umbilical hernia while working on deck. Though she had private health insurance, she still had to pay a significant deductible, and many of her surgical and medical expenses were only paid at 80%. In addition to the typical \$2,500, she received an additional \$680 toward expenses that were her responsibility as described in the explanation of benefits.

## **Discussion**

The Fishermen's Fund has not kept pace with inflation. Whereas in the 1950s, a benefit of \$2,500 was capable of providing significant assistance to sick or injured fishermen, nowadays it rarely covers more than a doctor's visit, basic emergency room treatments, or basic therapies. It may be that individuals are better covered by vessel P&I coverage and private health insurance than in the past. There are still numerous individuals who fall through the cracks and cannot cover their expenses when an injury or illness occurs during commercial fishing operations. These individuals and the care providers who are owed for their services are the ones who benefit to the largest extent from the Fund.

It would be tempting to ask the State of Alaska Legislature to allow a higher limit than \$2,500 to be paid for injuries or disabilities. Recall that this Fund predates statehood and is one of the few dedicated funds allowed in the state

government. Nearly all state appropriations are currently made through the state's General Fund and are subject to the wishes of the legislature and the potential veto of the governor. Given the financial difficulties that the state is currently wrestling with, any change in the original intent of or language establishing the Fund could easily mean the loss of its grandfather status and its incorporation into the General Fund. It is conceivable that the Fund would be financed at considerably lower levels or be eliminated altogether, with the revenues used for other purposes. The losers would be the more than 700 individuals who annually receive financial benefits and providers, often in remote locations, who might have difficulty collecting payments from financially strapped individuals.

## Conclusion

The Alaska Commercial Fishermen's Fund is a small but significant program with a 50-year history of service to the fishing industry. It is a fine example of an effort to ensure that by virtue of their work, fishermen have access to medical care. Currently, it is self-sustaining and well-managed. Future efforts at streamlining service with updated computer programs and the potential for on-line filing will be helpful to some fishermen and many providers. Continued communication with providers and members of the industry will ensure that the program is well utilized by commercial fishermen working in Alaska.

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# THE FAROE ISLANDS AND FISHING

**Óli Jacobsen**

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**Faroe Islands**

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First of all, I will say how happy I am to be here: I attended the first International Fishing Industry Safety and Health conference three years ago and found it very useful. Therefore, I wanted to come back, and this wonderful spot, Sitka, which I never have heard of before, is an ideal choice of site for this conference. This time I am not alone. We found the first conference so interesting that this time I brought three more people from my country. The Faroese delegation is one of the largest international groups here at IFISH II, outside those people coming from North America. The amount of time and travel expenses for our delegation to get to Sitka, however, can be justified given the importance of fishing in our country.

The Faroe Islands consist of 18 islands, located between Iceland and Scotland. The territory is 1400 sq km, with a total population of 48,000. The islands are an autonomous part of the Kingdom of Denmark, with our own culture, parliament, and government. We have our own language, but Danish and English are our second and third languages. All the younger people today speak English.

I became a fisherman in 1958, at the age of 14. Since 1971, I have been the elected chairman for the Faroese Fishermen's Association. I can say that I have had a practical and organizational association with the Faroese fishing industry over the last 45 years, and I have experienced all the great changes in the fishery during this time. Most notably, these include improvements in the area of safety. Members of our union have some of the best safety records in the industry, which makes us very proud.

## **Our union**

The Faroese Fishermen's Association was founded in 1911, and currently has about 2,500 members who work on the high seas fleet. Our purpose is, of

course, to work on behalf of the interests of fishermen and to promote safety and health as high priorities.

Our fishermen are paid according to collective agreements between the ship owners' association and our union. Faroese fishermen are paid with a share of the catch. In addition, our state guarantees fishermen minimum wages equal to the daily pay of an unskilled laborer who works 8 hours a day.

Our union has a newspaper, the *Ffbladið*, which is issued every other week. Our paper has a very high reputation and is widely read throughout the Faroe Islands. We write regularly about safety at sea, and as the paper is sent on board all fishing boats, the message finds its way to all fishermen. We plan on publishing a complete report on this conference, which will also be shared with our readers.

## **Fishing—the main industry of the Faroe Islands**

The main industry in our country is fishing; there are about 3,000 commercial fishermen in the islands out of a total population of approximately 47,000. Fish represents nearly all goods exported from the Faroe Islands. Few countries are as dependent on the sea's resources as ours. If there is a crisis in the fishing industry, the entire Faroe Islands community suffers.

The Faroese fishing industry began 130 years ago with the adoption of decked fishing boats. Before that, agriculture and fishing from open boats had characterized the Faroese economy. Just prior to the Second World War, the Faroes had 170 fishing vessels amounting to 19,000 GRT. During the war, the 39 ships and 180 men who were lost badly affected the country—not only in human terms, but also economically. In the 1950s, we started to build up a new fishing fleet. Since the 1960s, the Faroese fishing fleet has been among the best-developed in the world.

Traditionally, the Faroese fishing industry has been based on distant-water fishing, far from our shores. Our ships were, from the very beginning, and are fishing all over the North Atlantic—from Canada in the west to the Barents Sea in the east and north. In the past, the catches were salted and later frozen on board, and the crew stayed away from home for months, as there was no catch limit, but now the trips are limited to 3 months.

Our fishermen are not only fishing on Faroese boats; they have been crewing fishing fleets of other countries for decades. In the 1960s, for example, a great plan was promoted in Greenland to build up an ocean-going trawler fleet for the North Atlantic cod fisheries. Later those trawlers were converted to catch and freeze prawns. Faroese were involved in the planning and execution throughout these projects, and many Faroese now sail as skippers and engineers in this fleet. A similar situation occurred, with Faroese assisting and crewing, when the Canadians began building up their fleet of prawn trawlers. (Faroese are working all over the world, and not only in fishing. Tomorrow I will visit a cousin of my father on the other side of the border, in Canada. He had a leading job in an aluminum plant for many years.)

After the many industry changes in the 1970s, commercial fishing took place primarily within our domestic waters, where the catches are iced on board and delivered ashore every 1 or 2 weeks. But the Faroese still conduct commercial fishing all over the North Atlantic Ocean.

## **Faroese commercial fishing management system**

We think we have the best fish stock management system possible. Instead of quotas, we have effort limitation. We tried a quota system in the early 1990s, but we found this system didn't work in mixed fisheries. We also realized biologists' predictions regarding the marine resource were not always accurate, which also impacted the efficiency of a quota system. As a result, in co-operation with biologists, fishery administration, and the industry, we created an effort-based system.

The ships are allocated a number of days at sea in which to conduct fishing. Under this allotment scheme, they are more likely to bring ashore the entire catch, and waste and discard are less of a problem than under other systems. In addition to limitations on days at sea, we have closed areas and have incorporated other technical limitations.

The system appears to be working. Since it was implemented in 1996, we have had our most stable period of fishing ever. We still must address disagreements with our biologists, who have not officially recognized this Faroese system as a viable management system for fisheries. Marine biologists continue to use the quota system in their estimates, and independently of the state of the fish stocks, they recommend every year that efforts be cut by nearly one-third. However, the commercial fishing industry continues

to adhere to the effort limitation method of managing our fisheries, and in so doing, has begun to demonstrate that fishermen share a common interest with biologists in maintaining sustainable fisheries. There is increasing interest from other countries in our management system. Representatives from the fishing industries in other countries are coming to the Faroes to learn more about our system, recognizing that the traditional quota system is not necessarily the only solution for fisheries management.

## **Other fishing-related industries in the Faroes**

We have quite a large industrial base related to commercial fishing on the islands. Processing of fish fillets for freezing began in the 1950s, but this industry did not develop much until 1977, when the Faroese fishing limit was extended to 200 miles. There are now about 100,000 tons of ground fish landed at those factories yearly, providing jobs to shore-based workers, especially women.

I want to mention our fish farming, especially of salmon, which we started up in the 1980s. After rapid growth of this sector, there have been serious setbacks during the last couple of years because of the fall in the prices of farmed salmon, as well as an increase in disease in farmed stock. We hope the industry will recover after a couple of years, as the farming is the only real alternative we have to fishing on the ocean. In addition to the ground fish fleet, we have also a pelagic fleet with a number of big purse seiners, profitable both to fishermen and ship owners.

## **Safety and health of fishermen**

The Faroese Fishermen's Association wants to improve safety conditions for our fishermen. Safety has been improved compared to the old days, when ships just disappeared with the entire crew—typically resulting in the deaths of 20 fishermen coming from the same village, often from the same family. We recognize that many improvements have been implemented, but we also recognize that more education and training in this area must occur. It is very important to address the human factors that are associated with injuries and fatalities to commercial fishermen. In the Faroe Islands, it is compulsory for fishermen to attend a safety course before they go fishing, and new boats must be equipped with safety-related devices and gear. With reference to

the discussion about deck safety earlier during the conference, I would like to add that nearly all sea-going vessels are over-decked, which results in a considerable improvement in working conditions.

There is still need for further improvements—first, with regard to safety, but also concerning the living and working conditions on board. I am of the opinion that more attention should be paid to questions regarding lifestyle factors on board, as discussed at this conference by Anna Maria Simonsen. I became acutely aware of that issue when I was brought to the cardiovascular unit at the hospital 5 years ago. Many of my fellow patients were fishermen or former fishermen. The chief doctor confirmed that this pattern for hospitalization of fishermen had been occurring for quite some time. According to the cardiologist, fishermen are clearly overrepresented in heart diseases compared to the general Faroese population. They also suffer from hypertension, had an increased body mass index, are heavy smokers, and have unhealthy diets. We want to bring your attention to this question. We have taken steps to more fully define the lifestyle and health issues affecting our commercial fishermen, and funds have been given for further studies of the question. Our union has decided to provide the crew of each ship a new book with prescriptions for healthy food. We have also, in our collective agreement with the ship owners union, agreed to a nonsmoking policy aboard commercial fishing vessels.

We look forward to bringing home the experiences from this IFISH II conference. We have found the program very interesting, and we are eager to bring home all the input we have got. I am happy for my stay in Sitka. I have met many people. I have spoken to fishermen from all around the world and I am sure that the Faroese fishermen will benefit from what we have learned here.





# COMMERCIAL FISHING SAFETY: MAGNITUDE OF PROBLEM, RISK FACTORS, AND POTENTIAL SOLUTIONS

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## Background

Commercial fishing is one of the most dangerous occupations in the United States. In 2002, commercial fishermen had the second highest traumatic injury fatality rate of all workers—71.1/100,000 workers, which is 16 times the national rate of 4.4/100,000 workers across all occupations (Bureau of Labor Statistics 2003). Only timber cutters had a higher fatality rate of 117.8/100,000 (Bureau of Labor Statistics 2003). Many fishermen work in isolated locations and harsh environments with high winds, cold water, icing conditions, and long work days. They suffer fatigue, physical stress, and financial pressures to push their vessels and crew to make their living (Lincoln and Conway 1997; Conway, Lincoln et al. 2002).

Since 1991, many activities have been implemented to monitor and improve the safety of this industry. The purpose of this paper is to discuss the magnitude of the safety problem and to discuss some particular interventions that could be exported to other parts of the country and to other fishing countries to improve safety. This paper will discuss the problems of vessel sinkings, deck injuries, and falls overboard, and potential interventions for each of these problems.

## Vessel sinking

Most fatalities that occur in the commercial fishing industry in the United States are due to the loss of a vessel. From 1994-2000, 907 vessels sank in the United States, resulting in 218 fatalities (Dickey 2003), an average of 130 vessels and 31 lives lost each year.

Accurate workforce estimates are not available for the country to use to calculate trends. However, in Alaska, where such estimates have been made, it has been shown that there has been a significant decline in commercial fishing fatalities. This decline has occurred primarily in events related to vessel sinkings. From 1991-1999, an average of 34 vessels were lost each year in Alaskan waters with 106 people on board these vessels. The case-fatality rate has decreased from an average of 22% in 1991-1993 to 6% in 1997-1999 (Conway, Lincoln et al. 2002).

The US Coast Guard has developed several programs to prevent fatalities due to fishing vessel sinkings. The three that will be discussed include damage control trainers, stability trainers, and dockside enforcement activities.

### ***Damage control trainers***

The damage control trainer is used to simulate flooding situations on fishing vessels. Fishermen practice controlling flooding using plugs, rubber, and other miscellaneous items that would be found on a fishing vessel or in a damage control kit on the vessel. Being able to control these flooding situations could allow fishermen to save the vessel long enough to get to port or await aid. These damage control trainers have been used across the United States to train thousands of fishermen (Society of Naval Architects and Marine Engineers 2003).

### ***Stability trainers***

Stability trainers are used by the Coast Guard to educate fishermen on the effects of operational decisions on vessel stability. These vessel models are built to 1/16th scale of an existing fishing vessel. There are four cargo holds, a lazarette, and an engine room that can be filled with water, allowing the fisherman to observe adverse effects on vessel stability. The trainer can also be used to show how an increase in the center of gravity affects stability (Kvaerner Masa Marine 2003). These trainers enable the complicated dynamic of stability to be illustrated with a vessel model.

### ***Dockside enforcement***

Dockside enforcement strategies have been implemented for specific fleets in the Pacific Northwest. These efforts have been shown to be effective in improving the safety of specific fleets such as the Bering Sea crab fleet (Medlicott 2002) and the Oregon crab fleet (Lawrenson, Farrell et al. 2003). Fishing vessel examiners in Alaska, Washington, and Oregon have developed

targeted operations called “pulse operations.” In Alaska, they have boarded Bering Sea crab vessels prior to the crab season opening to review the vessel’s stability booklets and make sure they are not overloaded with too many crab pots (700-pound cages that are used to catch crab on the ocean floor). The examiners make sure boats are loaded properly for the predicted weather conditions and look at the safety gear, including the life raft, electronic position-indicating radio beacon (EPIRB), and immersion suits, to ensure there are enough for the crew and that everything is installed properly.

If the examiners find that the pots are loaded incorrectly or if there is a problem with the safety gear, then the vessel may not be allowed to get underway until the discrepancy is fixed (Medlicott 2003). Since implementation in 1998, only one fatality has occurred in this fishery, which was due to a fall overboard. The crab industry strongly supports this initiative (Medlicott 2002).

Washington and Oregon examiners conduct similar operations on the Dungeness crab fleet along their coast. These are smaller vessels that many times do not have stability letters, so in this operation, the examiners just look at safety equipment (see Lawrenson, Farrell, and Hardin, this proceedings). Safety gear suppliers have reported that fishing vessel owners and operators are reacting to this annual operation by getting gear ordered and checked earlier. The Coast Guard believes there has been a change in fishermen’s behavior because of these inspections (Lawrenson 2003).

In addition to these Coast Guard projects, training programs are available where fishermen get appropriate emergency training on how to react to emergencies at sea. These courses cover several topics including MAYDAY calls, EPIRBs, immersion suits/personal flotation devices (PDFs), life rafts, flares, emergency drills, and firefighting. The North Pacific Fishing Vessel Owners Association, based in Seattle, Washington, has classes on safety equipment and survival procedures, emergency drill instruction, fire prevention, and vessel stability and damage control (North Pacific Fishing Vessel Owners Association 2003). The Alaska Marine Safety Education Association (AMSEA), with instructors around Alaska, also offers emergency drill instructor courses. A study evaluating the effectiveness of AMSEA’s marine safety training showed that these courses were effective in preventing drownings among Alaskan commercial fishermen (Perkins 1995).

## **Deck injuries**

Not all fatalities are due to vessel sinkings. The fishing vessel is often a congested work area with hydraulic machines and fishing gear. About 10% of the fatalities in this industry nationwide are due to these types of deck hazards (Dickey 2003). Nonfatal injuries are also primarily due to deck injuries. Surveillance for nonfatal injuries in the commercial fishing industry is problematic. Although there is a requirement that severe injuries (loss of work for 3 or more days) be reported to the Coast Guard, they do not investigate or necessarily keep track of nonfatal injuries among fishermen. In Alaska, however, the state's Department of Health and Social Services maintains the Alaska Trauma Registry. This registry contains information on all hospitalized injuries, including those that occurred in the commercial fishing industry. A paper by B. Husberg, J. Lincoln, and G. Conway in these proceedings gives a thorough description of these data.

Based on these findings, the Deck Safety Project was established to examine the relationship between the vessel, fishing equipment, and the fishermen. We have many partners on this project, including Jensen Maritime Consultants. Many interventions have been identified to reduce the risk of injury at sea. These are discussed more in E. Blumhagen's paper in these proceedings. The solutions highlighted include ways of controlling fishing gear, identifying hazards on deck, and visibility. The Deck Safety Project is continuing to study the causes of these deck injuries and appropriate strategies to prevent them.

## **Falls overboard**

Falls overboard are caused by being washed overboard by waves, slips, trips and falls on deck, or being pulled over by fishing gear. From 1994-2000, 135 fishermen were killed due to falls overboard in the United States (Dickey 2003). Falls overboard accounted for 29% of all commercial fishing fatalities. To prepare this description of the falls overboard problem in the US commercial fishing fleet, I reviewed these 135 cases. Events were categorized by fishing gear, geographic location, number of crew on board, length of vessel, and fishery.

Fatalities due to falls overboard occurred most often along the Gulf Coast (49, 36%), followed by Alaska (24, 18%), and New England (23, 17%). The

highest number of falls overboard fatalities occurred using towed or dragged gear (55, 41%), followed by static gear (34, 25%). The most common fisheries involved were the shellfish fisheries: shrimp (42, 31%), crab (23, 17%), and lobster (17, 13%). In 36 of the fatalities (28%), the victims were fishing alone.

Several factors associated with preventing deaths from falls overboard have been identified. Strategies to prevent fatalities related to falls overboard include (1) avoiding becoming entangled in fishing gear by line lockers, bins, and fairleads, (2) interrupting the force of being pulled over by cutting the engine or cutting the line, (3) re-entry into the vessel after entering the water, and (4) use of personal flotation devices to aid persons in the water (Backus et al. 2002). Other interventions include shelter decks or seawalls to protect fishermen from weather, barriers between fishermen and gear to prevent entanglements, and practice with rescue gear for quick retrieval of victims in the water. Clearly, further investigation is needed of fatal events, as well as additional studies that help identify protective factors for fishermen who were successfully rescued from falls overboard.

The Seventeenth Coast Guard District in Alaska lists “wearing PFDs at all time while on deck” as one of their “Ready for Sea” checklist items that all fishermen should meet before going out to sea. “The practice of wearing PFDs while working on deck ... is a standard-of-care vessel crews should adopt” (p. 2002). A survey by the Coast Guard and NIOSH’s Alaska Field Station showed that 88% of the skippers on crab boats require their crew to wear PFDs when climbing on the stack (stack of crab pots on the back of the deck), but only 13% of them require wearing PFDs while working the gear (Thomas, Lincoln et al. 2001). A review of all drowning incidents subsequent to commercial fishing vessel losses showed the effectiveness of PFDs and survival suits. The study found that survivors of events in which at least one person drowned were 8.3 times more likely to have been wearing a PFD or immersion suit than were those who died (95% CI 3.59-19.24) (Conway, Lincoln et al. 2002).

## Summary

Several projects and ideas have been identified as ways to improve safety in the commercial fishing fleet. Interpreting surveillance data to help develop such programs is important. Collaborations have proven to be effective in developing ways to increase safety in the industry. Fishery-specific approach-

es such as the Dockside Enforcement Project and the Deck Safety Project can be applied to other areas. It is important to identify more programs, tools, and training programs to continue progress in making this industry safer.

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