

**Final report of the FRDC (Fisheries Research and Development Corporation) project
INTERNATIONAL ENVIRONMENTAL INSTRUMENTS -THEIR
EFFECT ON THE FISHING INDUSTRY.**

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Preface to the final report

The need for this project was identified by the fisheries policy unit of the Department of Primary Industry and Energy (DPIE). Under the terms of the research report FRDC wished to have a preliminary draft of the research presented to a fishing industry representative body for discussion, feedback, and clarification of emphasis. The environmental sub-committee of the National Fishing Industry Council (NFIC, now the Australian Seafood Industry Council, ASIC) were approached for suggestions and feedback on a draft of the report. However it should be noted that the opinions expressed in this document are those of the authors and should not be held to be the official policies of the fishing industry, the Fisheries Research and Development Corporation (FRDC), the Australian Maritime College, the University of Wollongong or any other organisations consulted.

The project commenced in September 1994 and uncovered a large volume of material in this rapidly expanding area. We wish the issues presented here to be discussed through the fishing sector as international environmental instruments may have potentially serious implications, and opportunities, for the Australian fishing industry.

This report focuses on the implications of international environmental instruments on fishing operations and fisheries management. During the research project it became apparent that many of the impacts on the fishing industry envisaged from international environmental instruments could arise from domestic environmental legislation which are independent of any implementation of international obligations. Such issues as environmental impact assessment and endangered species protection under national legislation were outside the terms of reference of the project.

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Executive Summary.

Throughout the world, the fishing industry has come under increased pressure to comply with environmental requirements. This pressure has been prompted by scientific evidence that most of the world's commercial fisheries stock have either been over-fished or are in danger of over-exploitation beyond their sustainable levels. This development must be seen in a wider international context. Since the past decade or so, there has been an intensification of international environmental consciousness with many international governmental organisations and non-governmental organisations putting pressure on governments to develop legal frameworks to achieve environmental protection at the international level. Consequently, a number of international environmental instruments have been negotiated in response to this new international environmental consciousness.

At the same time some individual countries, notably the United States of America, in response to domestic pressure from conservation groups and its powerful domestic fishing industry, has enacted a number of domestic legislation to impose certain conservation standards on the fishing industry. The implementation of these legislation also have significant international trade implications for the fishing industry.

The international environmental instruments affecting fisheries fall into two broad categories. The first category are those which may be described as treaties or conventions. They are legally binding on the parties to them. Some of these instruments are directly aimed at the fishing industry, whilst some are of general application but with potential implications for the fishing industry. In the second category are the so called "soft law" instruments which are resolutions or declarations by international organisations.

The broad findings of this report are that the objectives of fisheries management such as "conservation" and "optimum utilisation" of fisheries resources are stated in many binding instruments whilst the second wave of instruments which fall into the category of "soft" law, are more fisheries problem specific for example, protecting species, restoration, banning of specific gear, minimising bycatch and specific actions in management plans. The trend identified is that international environmental instruments relating to the fishing industry are moving from general objectives in currently binding instruments to more specific constraints and management methods in subsequent "soft law" instruments. The study also finds that the tightening of environmental constraints in fisheries management will be gradual, though the diversity of issues make the time for implementation of policies uncertain. These restraints will undoubtedly translate into more prescriptive legislation in respect of Turtle Exclusion Devices (TEDs or Trawling Efficiency Devices), fishing practices, closed areas, and species specific bans.

The report identified a number of internal and external strategic questions for the fishing industry in response to the growing international environmental instruments. The industry needs to identify their policies on: international instruments; bycatch issues; responsible fishing (moratoria, access, property rights and aquaculture); and compliance and education of industry members. Added value and niche marketing opportunities among environmentally conscious consumers may be targeted by industry through eco-labelling. Currently the industry is not sufficiently resourced at the representative level to address these issues of national and international importance.

The major task for the fishing industry is coming to terms with the changes that are required in responsible fishing and fisheries management because international instruments cannot be ignored. There is need for the industry to educate fishers on responsible fishing and also develop a national strategy to address the environmental effects of fishing which should include the implementation

of bycatch reducing devices where appropriate. Members of industry who may not conform to good industrial practices are a major concern for industry leaders given the publicity spotlight that can be placed on the industry by green NGOs.

Fisheries trade and environment issues will impact the industry in different ways. There is an inherent problem in reconciling free trade under GATT with more recent international environmental instruments which protect the marine environment. Sanitary and Phyto Sanitary measures will also be an important issue for the fishing and aquaculture industries in the future.

Externally there is a great need for government to have a transparent process to consult between government agencies and the fishing industry in the development of environmental instruments. The government and the fishing and seafood industry should address the resourcing of representative organisations in the fishing industry so they may fulfil the requirements of responsible fishing and can liaise with the other NGOs and government on management issues. Similarly the industry could put pressure on government at all levels to reduce marine pollution from land-based sources and other developmental activities along the coastal zone. This should be part of initiatives by the fishing industry to promote environmentally responsible fishing.

International Environmental Instruments at a glance.

Binding instruments (Directly influencing fisheries)

The Law of the Sea Convention (LOSC), 1982.

The Law of the Sea Convention imposes obligations on Parties to conserve the fisheries resources of the sea and to adopt management measures to promote the optimum utilisation of the fisheries.

The Convention on the Conservation of Antarctic Marine Living Resources, 1982.

This Convention is aimed at the conservation of Antarctic marine living resources. The rate of by-catch on non-targeted species has emerged as significant issue under the Convention.

The Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific Region, 1989.

This Convention prohibits the use of gillnets or driftnets which are more than 2.5 kilometres long in the EEZs of the countries in the South Pacific, including Australia and New Zealand.

The Convention for the Conservation of Southern Bluefin Tuna, 1993.

The aim of this Convention is to set quotas for Australia, Japan and New Zealand in respect of southern bluefin tunas to ensure the conservation of such species.

The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, 1993.

This Convention empowers parties to it to impose stringent conservation requirements on national fishing vessels fishing on the high seas. Such requirements may include gear and by-catch restrictions.

Draft Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea, 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995.

This Draft Agreement provides for the conservation and management of straddling fish stocks and highly migratory fish stocks on the high sea; and in limited circumstances, it also applies to fisheries management in the EEZ.

Binding instruments (Indirectly influencing fisheries)

Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR Convention), 1971.

This Convention aims to prevent the loss of habitats through encouraging the wise use of all wetlands. The Convention requires Parties to designate at least one national wetland for inclusion on a List of Wetlands of International Importance which are to be given special protection.

Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), 1972.

The objective of this Convention is the conservation of natural and cultural areas of outstanding universal value through their inclusion on a World Heritage List and a List of World Heritage in Danger.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, (CITES) 1973.

The objective of this Convention is to prevent over-exploitation of endangered species of flora and fauna by means of import and export permits for species identified in the appendices to the Convention.

Convention for the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1979.

The objective of this Convention is to conserve species of wild animals that migrate across or outside national boundaries by placing strict conservation obligations on Parties that are range states.

The Convention on Biological Diversity, 1992.

The Convention on Biological Diversity is aimed at the conservation of biological diversity and to promote the sustainable use of its components

Non binding instruments - "soft law"

The Tarawa Declaration, July 1989.

The Tarawa Declaration dealt with the damage driftnets were causing to the region's marine resources. In the Declaration, the South Pacific Forum described driftnet fishing as "indiscriminate, irresponsible and destructive" and resolved that South Pacific countries would develop a convention banning driftnet fishing in the region.

UN Resolutions 44/225 and 46/215, 1989 & 1991.

These resolutions called for a complete ban on driftnet fishing in the South Pacific and a world wide moratorium on all high seas driftnet fishing by December 1992 in all the world's oceans, including enclosed seas and semi-enclosed seas. The Resolutions specifically encouraged all members of the international community to take measures individually and collectively to prevent large scale pelagic driftnet fishing operations on the high seas.

Agenda 21 (UNCED, 1992)

Agenda 21 is the programme of action agreed to by States during the Rio United Nations Conference on Environment and Development in 1992. The thrust of Chapter 17 of Agenda 21 is simply to ask the international community to address environmental issues that affect the marine environment in a comprehensive manner. The adoption of the Precautionary Principle is one of the important aspects of Agenda 21.

Draft FAO Code of Conduct for Responsible Fishing, 1991-1994.

The Code of Conduct was developed by the FAO Committee on Fisheries. The aim of the Code is to provide guidelines for responsible approaches to fishing.

Background.

Since the 1982 United Nations Convention on the Law of the Sea many countries have claimed 200 nautical mile Exclusive Economic Zones (EEZs). In 1980, only about 5% of the world fish catch was taken from the high seas (ie areas of the oceans outside the 200 mile EEZ of any coastal state). By 1990, the figure rose to about 11%. The result has been that a number of fish stocks have come under pressure from overfishing with 14 out of 20 highly migratory tuna species being overfished (FAO, 1993).

As demand for fish increases and prices for fish products rise, there has been a new surge in the race to over-exploit known fish stocks, and to find and develop new stocks. This has resulted in increased investments in bigger, powerful and more efficient vessels and in technical innovations.

These developments have led to international concerns by some coastal States and international governmental and non-governmental organisations concerned with the sustainable use of the resources of the sea, to call for domestic and international action to promote a more rational conservation and utilisation of the fisheries resources of the oceans. These "green" concerns relate to target stock issues and selectivity and the impact of fishing gear on the wider marine environment.

In response to these concerns, a number of international instruments have been developed with the specific purpose of regulating how fishing is carried out. In addition to attempts to directly intervene in fishing, a host of other international instruments which have been developed to address wider conservation and environmental issues have the potential to be applied to fisheries.

Partly as a result of weaknesses of international law in addressing the conservation of the fisheries resources of the oceans, and partly as a result of domestic political pressure from environmental lobby groups, there has emerged a tendency for some countries such as the United States of America to impose unilateral trade measures to enforce fishing standards. These trade measures come in different forms. They include import bans, export bans and gear standards and the use of sanctions on related and unrelated fisheries products.

The FRDC response.

These international environmental instruments have likely economic ramifications for the Australian fishing industry. Recognising this, the Department of Primary Industries and Energy (Fisheries Policy) and the Fisheries Research and Development Corporation (FRDC) have seen the urgent need for the Australian fishing industry to be aware of these international developments and to begin to develop strategies to re-adjust to the likely impacts of these international concerns because previously, environmental concerns with respect to fishing operations were systematically overshadowed by social and economic considerations. Accordingly, FRDC commissioned the authors of this report to address the following issues:

- to identify, describe and analyse, from an Australian fishing industry perspective, the major aspects of relevant international environmental instruments that impact or have the potential to impact on the fishing industry;
- to prepare a concise plain language report on current developments in relevant international fora;
- to identify, describe and analyse applicable environmental legislation of the United States of America that impact on fisheries;
- to identify and analyse the key areas of potential action and any Australian fisheries likely to be affected by any of these international developments;
- to analyse the operational, fisheries management, legal and foreign policy implications of any action under the international environmental instruments;
- to identify strategies, both domestic and international, to avert or minimise any impact or potential impact on particular Australian fisheries;
- to identify opportunities for the Australian fishing industry in adhering to the international environmental instruments identified. Such opportunities may form part of a National Fishing Industry Marketing Strategy which is currently being undertaken by another consultant.

Tsamenyi and McIlgorm, FRDC project application, 1994

Presentation of results to industry.

In the project proposal the following publications were indicated:

- a) A draft of the project for discussion with the fishing industry (presented to NFIC, Environmental sub-committee members in April and discussions were completed in July, 1995)
- b) The final copy of the report
- c) Summary articles in popular fishing periodicals.

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Abbreviations.

ACOPS	Advisory Committee on the Protection of the Sea
AEZ	Australian Exclusive Economic Zone
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
ANCA	Australian Nature Conservation Agency
APPA	Australian Prawn Promotion Association
ASIC	Australian Seafood Industry Council (was NFIC)
BRDs	Bycatch Reduction Devices
CEPA	Commonwealth Environmental Protection Agency (see NEPA)
CITES	Convention on International Trade in Endangered Species.
COFI	Committee on Fisheries (FAO).
DFAT	Department of Foreign Affairs and Trade
DPIE(F)	Department of Primary Industry and Energy (Fisheries branch)
DWFN	Distant Water Fishing Nations
ES	Endangered Species
EEZ	Exclusive Economic Zone.
ESD	Ecologically Sustainable Development
FAO	Food and Agricultural Organisation (of the United Nations)
FPA	Fishermen's Protective Act (US)
GATT	The General Agreement on Tariffs and Trade
HMS	Highly Migratory Species
LOSC	Law of the Sea Convention (UN)
MMPA	Marine Mammal Protection Act (US)
NAFTA	North American Free Trade Agreement.
NEPA	National Environmental Protection Agency (was CEPA)
NFIC	National Fishing Industry Council
NGOs	Non Government Organisations
NMFS	National Marine Fisheries Service
NTBs	Non-Tariff Barriers
OECD	Organisation of Economic Cooperation and Development.
PP	The Precautionary Principle
PPM	Processes and Production Methods
QCFO	Queensland Commercial Fisherman's Organisation
SBT	Southern Bluefin Tuna.
SOMER	State of the Marine Environment Report
SPS	Sanitary and Phyto-Sanitary
SS	Straddling Stocks
TAC	Total Allowable Catch
TBT	Technical Barriers to Trade
TED	Turtle Excluding Devices (US) OR Trawling Efficiency Devices (AUS)
UNCED	United Nations Conference on Environment and Development. (Agenda 21).
US	United States of America
USCA	United States Code Annotated.

Section A: International Environmental Instruments: description and analysis.

PART I: INTERNATIONAL ENVIRONMENTAL INSTRUMENTS WHICH IMPOSE LEGAL OBLIGATIONS

This part of the report will describe and evaluate the international environmental instruments affecting fisheries which are legally binding on Australia in international law or in which Australia has recently participated in and is likely to ratify. The instruments can be classified under two sub-headings; namely (a) those specifically dealing with fisheries and (b) instruments concerning nature conservation as a whole with indirect application to fisheries. The description of the binding instruments in this section will be organised under the two sub-headings above.

A. Instruments specifically dealing with fisheries

1. United Nations Convention on the Law of the Sea 1982.

The *United Nations Convention on the Law of the Sea*, 1982 (LOSC) became binding on 16 November 1994. The LOSC provides rules to regulate all aspects of the uses of the sea and the conservation of the marine environment. The fisheries aspects of the LOSC are mainly found in the provisions dealing with the exclusive economic zone (EEZ) and on the high seas. The LOSC permits every coastal State to claim an EEZ which may extend 200 nautical miles from the territorial sea baseline of the coastal State. Within the EEZ, coastal States have been given sovereign rights for the purpose of conserving and managing the living resources of the area.

Under the LOSC the areas of the sea outside the 200 nautical mile EEZ constitute the high seas for fishing purposes. Under international law, all fishing activities on the high sea are subject to the freedom of the high seas. This concept of "freedom of the high seas", allows each State to regulate fishing activities carried out by vessels flying its flag. In recent times there have been complaints from international conservation groups, international fisheries organisations such as the Food and Agricultural Organisation (FAO) and some coastal States concerning the rapid depletion of high seas fisheries as a result of the lack of any effective national controls. These concerns are currently being addressed at the international level through the United Nations Conference on Straddling Stocks and by the FAO Code of Conduct for Responsible Fishing. These developments are analysed later in this report.

Fisheries Implications

The LOSC is the main international instrument which regulates marine fisheries. It imposes an obligation on every coastal State that has declared an EEZ to conserve the fisheries resources and to ensure optimum utilisation of the fisheries resources in the EEZ. To achieve these objectives, the Convention permits the coastal State to implement a number of measures. These include the obligation to determine the total allowable catch (TAC) and to promulgate laws and regulations to control fishing in the EEZ. Such control measures may include:

- the licensing of fishers, fishing vessels and equipment;
- determining the species which may be caught, and fixing quotas of catch;
- regulating seasons and areas of fishing, the types, sizes and amount of gear, and the types, sizes and number of fishing vessels that may be used; fixing the age and size of fish and other species that may be caught; and
- regulating the by-catch of other species.

In addition to the requirements to conserve the living resources of the sea, the LOSC also imposes obligations on coastal States to protect the marine environment and to control the

pollution of the sea. The legal and administrative measures which a coastal State can take to protect the marine environment as a whole are very broad and may impact on fishing operations. These measures include the following:

- prohibition of the release of toxic, harmful to noxious substances into the sea;
- protection and preservation of rare or fragile ecosystems and the habitats of depleted, threatened or endangered species or other forms of marine life; and
- the design, construction and operation of all vessels on the sea.

The conservation and the general environmental obligations of the LOSC are gradually being implemented into domestic law by many coastal States. In Australia the broad objectives of the Convention have been incorporated into Australian fisheries law under the *Fisheries Management Act, 1991* (Cwth). According to section 3(2) of this legislation in implementing the objectives of the legislation, the Minister, AFMA and Joint authorities are to have regard to the objectives of ensuring through proper conservation and management measures, that the living resources of the EEZ are not endangered by over-exploitation. They are also to achieve the optimum utilisation of the living resources of the Australian EEZ.

In the years ahead, a number of general environmental legislation and regulation are going to be implemented by relevant Commonwealth and State Departments to implement Australia's obligations under the LOSC. These are likely going to affect various fishing operations in the Australian EEZ, including the types of species to be caught, gear and vessel limitations and areas of fishing.

2. The Convention on the Conservation of Antarctic Marine Living Resources, 1982.

This Convention came into force in April 1982. The objective of the Convention is to promote the conservation of Antarctic marine living resources. Article 2 of the Convention defines conservation to include "rational use". The Convention applies to the areas between south of 60 degrees South Latitude and the Antarctic Convergence.

Fisheries implications

The Convention institutes common guidelines for the harvesting of Antarctic marine living resources. Under Article II, any harvesting and associated activities in the Convention area are to be conducted with the view to:

- maintaining any harvested population to levels below those which ensure stable recruitment;
- the maintenance of the ecological relationship between harvested, dependent and related populations of Antarctic marine living resources and the restoration of depleted populations to sustainable levels.

Australian fishers fishing in areas covered by the Convention on the Conservation of Antarctic Marine Living Resources will also be required to comply with bycatch restrictions relating to non-targeted species of fish and seabirds. Measures have been instituted to reduce the by-catch of sea birds. In addition, the 1994 meeting of the parties also endorsed certain conservation measures to regulate long lining in the Convention area. These include operational techniques which sink baited hooks as soon as possible after their placement in water; mandating the setting of lines at night; the prohibition of dumping of offal and trash while lines are set or hauled; the requirement that every effort should be made to release live birds from lines; mandating the use of streamer lines as bird scarers.

3. Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific Region 1989 and Protocols (Driftnet Convention) 1989.

The Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific Region was concluded on November 29, 1989. The Convention was concluded in response to the rapid increase in the use of long driftnets by Asian fishing vessels in the South Pacific region in the late 1980s. The use of fine, small mesh size, nylon nets which could be stretched to distances up to 40 or 60 kilometres is generally believed to have devastating effects on the environment and marine living resources. As a result, environmental groups and governments in the region became concerned about the effects of driftnets on the ecological balance of the marine environment.

The Driftnet Convention commits States Parties to prohibit their nationals and vessels from engaging in driftnet fishing within the Convention Area. The "Convention Area" is defined as the area lying within 10 degrees North latitude and 50 degrees South latitude and 130 degrees East longitude and 120 degrees West longitude and includes waters under the jurisdiction of Parties. This includes Australia's internal waters, territorial sea and exclusive economic zone.

The definition "driftnet" is defined as a gillnet or other net or a combination of nets which is more than 2.5 kilometres in length which enmesh, entrap or entangle fish by drifting on the surface or in the water. Driftnet fishing is defined as catching, taking or harvesting fish with the use of a driftnet; attempting to catch, take or harvest fish with the use of a driftnet; engaging in any activity which can reasonably be expected to result in the catching, taking or harvesting of fish with the use of a driftnet, including searching for and locating fish to be taken by that method. Support services which may not be directly related to fishing are also included in the definition. Any operations at sea in support of, or in preparation for any activity described above including operations of placing, searching for or recovering fish aggravating devices or associated electronic equipment such as radio beacons are defined as driftnet fishing. In addition, the use of aircraft to support the activities described above, and transporting, transshipping and processing any driftnet catch and cooperation in the provision of food and other supplies for vessels equipped or used for driftnet fishing are included.

Fisheries Implications

The main implications of the Driftnet Convention may be summarised as follows:

- It requires that the parties to it to prohibit their nationals and vessels registered under their laws from engaging in driftnet fishing activities in the areas covered by the Convention. This means that no Australian national or vessel registered in Australia and flying the Australian flag may use driftnets any where within the Convention Area.
- Parties are under obligation to prohibit landing of driftnet catches within their territories and prohibit the processing of catches in facilities under their jurisdiction. This means that no vessel including those of non-Parties may land their catch or tranship their catch in areas under the jurisdiction of Parties.
- Parties may prohibit the importation of fish or fish products whether processed or not, caught using a driftnet and restrict access and port servicing facilities for driftnet fishing vessels. They may also prohibit the possession of driftnets on board any fishing vessels within their fisheries jurisdiction.

Implementation of the Driftnet Convention in Australia

Australia's obligations under the Driftnet Convention have been implemented under the *Fisheries Management Act* 1991 (Cwth). Under Section 13 of the Act .

- a person must not engage in driftnet fishing activities in the Australian Fisheries Zone (the penalty for this offence is \$50,000);
- an Australian citizen must not engage in driftnet fishing activities outside the Australian Fishing Zone. This provision literally prohibits the use of driftnets by Australian citizens on the high seas and in the EEZs of other countries (the penalty for this offence is \$50,000);
- a body corporate that is incorporated in Australia or carries on business activities mainly in Australia must not engage in driftnet fishing activities outside the Australian Fishing Zone (the penalty for this offence is \$250,000);
- a person must not, whilst outside the Australian Fishing Zone, engage in driftnet fishing activities from an Australian boat (the penalty for this offence is \$50,000).

4. Convention for the Conservation of Southern Bluefin Tuna.

Deepening concerns that the whole southern bluefin tuna fishery could collapse led directly to the negotiation of the Convention for the Conservation of Southern Bluefin Tuna on 10 May 1993. The parties to the Convention are Australia, Japan and New Zealand. The objective of the Convention is "to ensure, through appropriate management, the conservation and optimum utilisation of southern bluefin tuna."

Fisheries Implications

Apart from quota allocations, the Convention for the Conservation of Southern Bluefin Tuna does not have any implications for the fishing industry along the lines being discussed in this report.

5. Agreement to Promote Compliance with International Conservation and Management Measures by fishing Vessels on the High Seas, 1993.

This agreement was concluded as part of the efforts of the FAO to institute a code of conduct for responsible fishing on the high seas. The draft Code of Conduct is described later below. The aim of the Agreement is to regulate the reflagging of fishing vessels which, according to the FAO, has become a means of avoiding compliance with international conservation and management measures for living marine resources.

The Agreement requires that Parties take certain measures to ensure that fishing vessels entitled to fly their flag do not engage in any activity that undermines the effectiveness of international conservation and management measures. However, a Party may exempt a fishing vessel of less than 24 metres in length from the application of the Agreement. Where a Party has granted such an exemption to a fishing vessel, the State is nevertheless required to take effective measures in respect of any such fishing vessel that undermines the effectiveness of international conservation and management measures. These measures shall be such as to ensure that the fishing vessel ceases to engage in activities that undermine the effectiveness of international conservation and management measures.

The specific measures required by the Agreement are:

- no Party is to allow any fishing vessel entitled to fly its flag to be used for fishing on the high seas unless it has been authorised to be so used by the appropriate authorities of that Party.

- a fishing vessel that has been previously registered in another country and which has undermined the effectiveness of international conservation and management measures can only be authorised by a party to the agreement to be used for fishing on the high seas under two conditions: (a) if any period of suspension by another Party of an authorisation to use the vessel to fish on the high seas has expired and (b) no authorisation for such fishing vessel to be used for fishing on the high seas has been withdrawn by another party within the last three years.

Fisheries Implications

Australia has not yet ratified this Agreement. Ratification by Australia will give power to the Commonwealth to impose stringent conservation requirements on Australian fishing vessels fishing on the high seas. Such requirements may include gear and bycatch restrictions.

6. Draft Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995.

Although the United Nations Conference on Environment and Development recognised the urgent need to develop more stringent conservation obligations for fisheries on the high seas, the Conference failed to reach agreement on the issue. Instead the Conference proposed that States should convene an inter-governmental conference under United Nations auspices, taking into account relevant activities at the subregional, regional and global levels, with a view to promoting effective implementation of the provisions of the LOSC on straddling fish stocks and highly migratory fish stocks. The conference was required to identify and assess existing problems related to the conservation and management of such fish stocks, and consider means of improving cooperation on fisheries among States, and formulate appropriate recommendations.

After several meetings, a draft Agreement for the Implementation of the Provisions of the Law of the Sea Convention relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks was produced in August 1995. It is expected that this agreement will be open for signature in November 1995. Australia was an active participant in the UN Conference. Current expectations are that the Australian Government will sign the Convention in November 1995, and eventually ratify it.

Essentially, the Draft Agreement provides for the conservation and management of straddling fish stocks and highly migratory fish stocks on the high sea; except Articles and 7 which also apply to fisheries management in the EEZ. Article 6 in particular deals with the application of the precautionary principle to fisheries (which is discussed later in this report). To achieve its objectives, the Draft Agreement imposes a number of obligations on Parties to it. They are to:

- adopt conservation and management measures to ensure long term sustainability and promote optimum utilisation of fish stocks;
- ensure that such measures are based on the best scientific evidence available and are designed to maintain or restore stocks at levels capable of producing the maximum sustainable yield, as qualified by relevant environmental and economic factors, including special requirements of developing States;
- apply the precautionary approach in accordance with article 6;
- adopt where necessary, conservation and management measures for other species belonging to the same ecosystem or dependent upon or associated with the target species, with a view

to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened;

- promote the development and use of selective, environmentally safe and cost effective fishing gear and techniques in order to minimise pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species (both fish and non-fish species) and impacts on ecologically related species, in particular endangered species;
- take into account the need to protect biodiversity;
- take measures to eliminate over-fishing and excess fishing capacity and to ensure that levels of fishing effort do not exceed those commensurate with sustainable utilisation of fisheries resources; and
- collect and share, in a timely manner, complete and accurate data concerning fishing activities, *inter alia*, on position, catch of target and non-target species and fishing effort, as well as information from national, regional and international research programs.

Fisheries implications

The draft Agreement contains provisions which would impact on fishing operations as currently undertaken.

- Precautionary approaches will need to be applied in fisheries management (this is discussed further below)
- Some fishing operations that are threatened by overfishing may need to be suspended.
- The development and use of selective, environmentally safe and cost effective fishing gear could affect rates of productivity .
- The need to protect bio-diversity will require changes to fishing gear, and the institution of other protective measures such as reducing catch quotas, designating closed seasons or closed areas.
- Measures which eliminate over-fishing and excess fishing capacity will impose additional burdens on the Industry.
- The Industry will need to show its vessels are able to effectively comply with conservation and management measures where they are involved in fishing on the high seas.
- If vessels are to operate on the high seas, a number of measures which the flag State may take which would impact on the Industry. These measures are: (i) vessels must be licensed or authorised (ii) vessels must carry their licence while fishing on the high seas; and (iii) vessels must be appropriately marked with uniform and internationally recognised vessel and gear marking systems.

B. Instruments of general application to nature conservation

7. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) 1971.

The objective of the Ramsar Convention is to protect wetlands which are habitats supporting flora and fauna. This is to be done by establishing nature reserves. The Convention defines wetlands as areas of marsh, fen, wetland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. Parties to the Convention are required to designate at least one suitable wetland within their territories for inclusion in a list of "Wetlands of International Importance".

Fisheries Implications

So far, Australia has designated 42 wetlands under the Ramsar Convention. Some of the Australian designated wetlands are very important fish habitats, for example the Kooragang Wetland in New South Wales. The fishing implications of the Ramsar Convention may include fishing closures, total prohibition of fishing in areas convened by or near a wetland, gear restrictions and bycatch restrictions.

As the focus of the Ramsar Convention is on the protection of wetlands, the achievement of the objectives of the Ramsar Convention would appear to be in the best interest of the fishing industry. This benefit has been recognised by the fishing industry which is giving consideration to sponsoring the 1996 meeting of the Ramsar Convention Committee in Brisbane.

8. Convention for the Protection of the World's Cultural and Natural (Heritage (World Heritage Convention), 1972.

The objective of the World Heritage Convention is to promote international cooperation to protect unique natural and cultural properties of outstanding universal value, whose conservation is deemed to be of concern to all people. Parties to the Convention are committed to a range of national and international obligations. In particular each party is required to identify, protect, conserve, present and transmit to future generations unique cultural and natural heritage situated on its territory. The identification of properties for inclusion on the World Heritage list is the responsibility of the State on whose territory the property is situated. It is also the State's responsibility to nominate property for world heritage listing.

Australia has implemented the World Heritage Convention in domestic law through the *World Heritage Properties Conservation Act* 1983 (Cwth.). This legislation allows the Commonwealth government to make regulations to prohibit activities in a world heritage area that are incompatible with the world heritage status of the area. It is then unlawful for a person to undertake such activities without the consent of the Commonwealth Minister for the Environment. For the prohibition to take place, two conditions must be satisfied. First, the property must be "identified property." This means that it must either be placed on the World Heritage List; or nominated for World Heritage listing; or subject to an inquiry as to its world heritage values; or form part of the cultural and natural heritage. Second, the Governor-General must be satisfied that the property, or part of it, is being or is likely to be damaged or destroyed.

Fisheries Implications

Australia is one of the key supporters of the World Heritage Convention. There are currently 12 Australian properties on the World Heritage List. Five of these properties comprise marine areas which are significant fishing grounds. These are the Great Barrier Reef, Shark Bay, Fraser Island, Lord Howe Island and Kakadu.

Each of the Australian world heritage properties are to be managed under separate management plans. At present, management plans have been promulgated for the Great Barra Reef and parts of Shark Bay. The existing management plans do not prohibit fishing activities in the world heritage areas. For example, commercial fishing is permitted in some parts of the Great Barrier Reef under a zoning plan.

Restrictions are likely to be placed on fishing operations that are shown to damage or reduce the world heritage qualities of listed properties. Such restrictions may include gear restrictions, the prohibition on harvesting certain species, and restrictions on fishing in certain areas. For example, fisheries closures have been imposed under New South Wales Fisheries legislation in some parts of Lord Howe Island. Further, the combined impact of the World Heritage Convention and the Convention on Biological Diversity is likely going to increase pressure on governments to ban certain types of fishing operations such as trawling in world heritage areas because of their potential impact on the marine environment. Already there was an attempt to ban trawling from Shark Bay.

9. Convention on International Trade in Endangered Species of Flora and Fauna (Washington Convention (CITES), 1973.

The aim of the *Convention on International Trade in Endangered Species of Flora and Fauna* (CITES) is to regulate trade in certain species of flora and fauna which are being threatened with extinction. The Convention seeks to achieve this objective through regulation of international trade in these species. Trade is defined in the Convention as "export, re-export, import and introduction from the sea". Introduction from the sea is defined to mean "transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State".

The Convention classifies the species regulated into two appendices. Appendix I includes species, subspecies or populations threatened with extinction that are or may be affected by trade. Generally, commercial trade in these species is prohibited. International trade in these species may be permitted for "scientific or conservation" purposes. In this case, import permits from the importing and the exporting country are required. Appendix II includes species which might become endangered if trade in them is not controlled and monitored. It also includes other look-alike species which, although not necessarily threatened, must be subject to regulation in order that trade in other Appendix II species may be brought under control.

Trade in Appendix I species may only take place in accordance with certain laid down criteria. For the exporting country, the scientific authority of the exporting State must certify that the export of the specimen will not be detrimental to the survival of the species. In addition, the management authority must certify that the specimen was not obtained in contravention of its laws for the protection of fauna and flora and that it is satisfied that any living specimen is prepared and shipped in a manner that minimises the risk of injury, damage to health and cruel treatment. The management authority of the exporting country must also be satisfied that an import permit has been obtained by the exporter. An export permit will only be granted if the relevant scientific authorities of the exporting States have advised that such export will not be detrimental to the species. Furthermore the management authority of the exporting State must satisfy itself that the species have not been obtained in a manner which violates its laws regarding the protection of those species, and that the species being traded are well prepared and shipped in a manner that minimises risk of injury, damage to health or cruel treatment and that an import permit has been granted for the specimen.

Trade in Appendix II species requires an export permit from the country of origin, issued by the competent authority. If the species are exported from a country other than where they originated, a re-export permit is required.

Fisheries Implications.

The *Wildlife Protection (Regulation of Exports and Imports) Act 1982* (Cwth) gives effect to Australia's obligations under CITES. Under the Act the export of Schedule 1 species is strictly regulated to prevent their becoming more endangered. The species in this category include marine turtles and dolphins. Export of Schedule 2 species may only be undertaken under an approved management plan. Marine species in this category include dugongs and giant clams.

CITES is designed to cover all species of plants and animals, including marine species. The inclusion of marine species under CITES is confirmed by the fact that the Convention governs trade in any specimen of a species included in Appendix I or II that is 'introduced from the sea'. Presently, few marine species are listed under CITES. The marine species listed are primarily higher vertebrates, such as great whales, sea turtles, and the salt water crocodile. Five species of marine fish and six taxa of corals are listed under CITES. Three of the fish species are anadromous sturgeons that migrate into fresh water rivers to spawn. The other two are the *coelacanth* and the *totoaba*.

In the last three years, conservation groups and some countries have mounted pressure to broaden the scope of CITES to include some marine species of commercial value. For example, there was an attempt by Sweden in 1992 to include Atlantic bluefin tuna on Appendix 1 of CITES. This proposal was not successful because of opposition by members of Commission for the Conservation of Atlantic Tunas. Similarly, in 1994, Kenya proposed the listing of both northern and southern bluefin tuna on Appendix 2 of CITES. The proposal was later withdrawn. At present there appears to be very little discussion within the CITES forum to include further marine species on the CITES appendices. The authors of this report have been advised by the CITES Secretariat as follows:

Within the CITES forum, however, there has been very little discussion of fisheries matters. Some discussion was generated at the eighth meeting of the Conference of the Parties (Kyoto, March 1992), as a result of the submission of proposals to include populations of herring and the bluefin tuna in the appendices. These proposals were withdrawn following brief discussions in the committee stage of the meeting (Communication with Jonathan Barzdo, Management Authorities Co-ordinator, CITES Secretariat, 20 September 1994).

The 9th meeting of the parties to CITES which met in Fort Lauderdale from the 7th to 18th November 1994 agreed on two important issues.

- to revise the criteria for listing species under the Convention and to make the process more objective.
- to consider in future the issue of international trade in and status of sharks. To this end, the Animals Committee of CITES was requested to prepare a discussion paper on the biological and trade status of sharks before the 10th meeting of the parties.

Should any commercially harvested species of fish be listed under CITES, the impact of on the fishing industry will depend on the particular appendix under which the listing occurs. As shown above, an Appendix I listing would trigger international trade prohibitions on any marine species taken from areas outside national jurisdiction and transported into areas under national

jurisdiction since that would constitute "introduction from the sea." However, listing by itself would not prohibit the harvesting or domestic sale of such species.

10. Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention).

The aim of this Convention is to conserve terrestrial, marine and avian migratory species throughout their range. The Convention defines "migratory species" as "an entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries". The species covered by the Convention are regulated under two separate appendices. Appendix I contains a list of species that are "endangered", while Appendix II covers species which are likely to be endangered.

The obligations of Parties in respect species listed in Appendix I include the following:

- to conserve and where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction;
- to prevent, remove, compensate for, or minimise, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and
- to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating already introduced exotic species.

Parties to the Convention also undertake to prohibit the taking of animals belonging to such species. Exceptions may be permitted where (a) the taking is for scientific purposes; (b) the taking is for the purpose of enhancing the propagation or survival of affected species; (c) the taking is to accommodate the needs of traditional subsistence users of such species; or (d) extraordinary circumstances so require.

Species listed under Appendix II are considered to have unfavourable conservation status and require international agreement for their conservation and management. Such an Agreement must achieve the following objectives:

- identify the migratory species covered;
- describe the range and migration route of the migratory species;
- provide for each Party to designate its national authority concerned with the implementation of the agreement;
- establish, if necessary, appropriate machinery to assist in carrying out the aims of the agreement, to monitor its effectiveness, and to prepare reports for the Conference of Parties;
- at a minimum, prohibit, in relation to a migratory species of the Order Cetacean, any taking that is not permitted for that migratory species under any other multilateral agreement.

Fisheries Implications

The Bonn Convention applies equally to migratory marine species; as such the Convention has the potential to affect fishing operations. Some marine species of commercial value such as tuna and billfish are classified as "migratory species". Presently, it would appear that no commercially harvested fisheries stock are listed under the Convention.

Given the ongoing pressure from conservation concerns about fishing, it is possible that some commercially harvested species may be listed in future. Listing may occur in future because of the growing pressure on fishing from conservation groups. The possible implications of this may include: gear restrictions, by-catch reduction and restrictions on catching certain species.

11. United Nations Convention on Biological Diversity 1992

The Convention on Biological Diversity was concluded as part of the United Nations Conference on Environment and Development (UNCED) process in 1992. The aims of this Convention are to conserve biological diversity, promote the sustainable use of its components and ensure fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. The Convention defines biological diversity very broadly to include "variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part".

The Convention regulates the *in-situ* and *ex-situ* conservation of biological diversity. *In-situ* conservation is defined to mean the conservation and maintenance of ecosystems and natural habitats in their natural surroundings. *Ex-situ* conservation means the conservation of biological diversity outside their natural surroundings.

To protect biological diversity situated in their territories, the Convention requires Parties to it to take a implement a number of broad policies. The general measures which must be developed for the conservation and the sustainable use of biological diversity include the following:

- to develop national strategies, plans and programs for the conservation and sustainable use of biological diversity;
- where plans already exist, parties are required to adapt them to reflect the measures set out in the Convention
- to integrate the conservation of biological diversity into relevant sectoral plans and programmes;
- to identify components of biological diversity important for its conservation and sustainable use;
- to monitor, through sampling and other techniques, the components of biological diversity identified;
- to identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor there effects through sampling and other techniques; and
- to maintain and organise, by any mechanism data, derived from identification and monitoring activities.

In relation to *in-situ* conservation of biological diversity, the Convention requires that parties undertake the following actions:

- establish a system of protected areas;
- develop (where necessary), guidelines for the selection, establishment and management of such protected areas;
- regulate or manage such protected areas;
- promote the protection of ecosystems, natural habitats;
- rehabilitate and restore degraded ecosystems and promote the recovery of threatened species;

- manage and control all risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts on particular ecosystems;
- prevent the introduction of and control or eradicate alien species which threaten ecosystems, habitats or species;
- provide conditions needed for compatibility between present uses of particular biological diversity;
- subject to its national legislation, respect, recognise and preserve the interests and lifestyles of indigenous peoples and their practices;
- develop legislation or adopt other regulatory mechanisms to protect threatened species and their populations.

Fisheries Implications

The Commonwealth Government has ratified the Convention on Biological Diversity. At present, the Commonwealth has not enacted any domestic legislation to implement its obligations under the Convention, but has proposed to implement the Convention through a National Strategy. It is clear from the Convention on Biological Diversity and the Commonwealth's strategy that the Convention is intended to be applied to the terrestrial and the marine environment. Like the Convention, the Strategy makes it clear that the Convention on Biological Diversity Convention applies to the marine environment.

Section 2.3 of the Strategy is devoted to fisheries. The objective of the section is to achieve "the conservation of biological diversity through the adoption of ecologically sustainable fisheries management practices". To achieve this objective, the Strategy proposes two actions:

(a) improving the knowledge base of fisheries and (b) improving fisheries management. The relevant parts of these actions are reproduced below.

Under 2.3.1, the Strategy proposes increase data collection and coordinated research into the biological diversity and human use of the Australian Fishing Zone and estuarine and freshwater areas, with priority being given to the following:

- the impact of recreational fishing on fisheries, fish and their habitats;
- the impact of commercial fishery practices on non-target and by-catch species and ecosystems, on the viability of populations, and on genetic diversity;
- the development of fishing techniques that are species specific, that have the least impact on non-target species, and that minimise waste of the resource, with particular emphasis on trawling and shellfish dredging;
- the development of rapid monitoring techniques, especially where native species are harvested;
- the identification of critical habitats for harvested native fishes, in particular spawning and nursery grounds;
- the development of 'state of the environment' reporting for freshwater, estuarine and marine area;
- the determination of the impact of both aquaculture species and aquaculture management practices on the environment, including aquatic wildlife.

Section 2.3.2 of the Strategy on improved management is aimed at ensuring "that the implementation of fisheries ecosystem management, as agreed to by the Australian and New Zealand Fisheries and Aquatic Council and outlined in the National Strategy for Ecologically Sustainable Development, is consistent with the conservation of biological diversity. Priority is to be given to the following areas:

- reviewing the appropriateness of current management strategies, techniques, standards, jurisdictions and legislation;
- using economic instruments and incentives for conservation activities, including rehabilitation programmes;
- developing and adopting practical and acceptable codes of practice for the management and monitoring of commercial and recreational fishing, for the conservation of invertebrates, for the rehabilitation of depleted stocks, and for key habitat and spawning areas;
- developing through the Australian and New Zealand fisheries and Aquaculture Council, in consultation with relevant ministerial councils, the national strategy and guidelines for managing recreational fishing on an ecologically sustainable basis;
- implementing, in consultation with industry, such necessary changes to current practices as identifies under Action 2.3.1 above;
- developing through the Australian and New Zealand Fisheries and Aquaculture Council, in consultation with relevant ministerial councils, national strategy and guidelines for managing aquaculture developments;
- developing, where necessary, rehabilitation programmes for aquatic habitats of importance to biological diversity conservation.

At this stage, it is not clear what the exact fisheries implications of the Convention on Biological Diversity are going to be. This is primarily because the Convention is very new and no actions have yet been taken to implement it. It is also not clear at this stage how the Commonwealth is going to implement the Convention. What is clear is that the Convention on Biological Diversity is becoming a powerful tool in the hands of conservation groups to lobby governments to prohibit resource development in protect particular areas, including parts of the sea. Whilst the Convention recognises that its implementation must achieve compatibility between present uses and the conservation of biological diversity, other provisions of the Convention indicate that resource activities may be prohibited in particular areas to protect biological diversity.

From the provisions of the Convention and the Commonwealth's Biological Diversity Strategy, the possible implications of the Convention for the fishing industry may include gear restrictions (the strategy specifically mentions trawling and shellfish dredging); species restrictions; area restrictions and by-catch reduction. The implementation of the Convention may also result in the declaration of protected areas where fishing will be totally prohibited or allowed in restricted circumstances. However, the National Strategy makes it clear that any action to protect biological diversity must be in consultation with the relevant stake holders. In the case of the protection of biological diversity in the marine environment, this means that relevant States and Territories fisheries administrations, industry, indigenous and recreational groups must be consulted before any actions are implemented. Ultimately, the fishing industry may have to take anticipatory measures by developing codes of conduct for responsible fishing. This is already happening as evidenced by the recommendation of the Food and Agricultural Organisation that a code of conduct for responsible fishing be adopted.

PART II: "SOFT LAW" OR NON-BINDING INSTRUMENTS.

In addition to the treaties or conventions described above, a large body of non-binding international instruments - mainly declarations and resolutions of international organisations and meetings of states address fisheries issues specifically. These instruments are called "soft law". Although they do not create binding legal obligations, they may influence international and domestic fisheries policy making. They may also provide the basis for binding agreements at a future date.

1. Declarations/ Resolutions on Driftnet Fishing

(i) The Tarawa Declaration, July 1989

The Tarawa Declaration was a political response by countries in the South Pacific concerning the damage driftnets were causing to the region's marine resources. In the Declaration, the South Pacific Forum described driftnet fishing as "indiscriminate, irresponsible and destructive" and resolved that South Pacific countries would develop a convention banning driftnet fishing in the region; and establish a management regime for South Pacific albacore tuna.

The Tarawa Declaration had a significant international political impact on the banning of driftnet fishing in the South Pacific. It received the support of a number of countries and organisations. For example:

- the 29th South Pacific Conference in Guam in October 1989 endorsed the Declaration. The United States of America, the United Kingdom and France, together with all South Pacific countries and territories participated in this meeting.
- in October 1989 the South Pacific Conference on Nature Conservation in Vanuatu, organised by the South Pacific Regional Environment expressed its support for the Tarawa Declaration.
- at the Commonwealth Heads of Government Meeting in Malaysia in October 1989, the Tarawa Declaration was unanimously endorsed along with a range of other environmental issues in the Langkawi Declaration. The Commonwealth Heads of Government commended the Tarawa Declaration and urged immediate abandonment of the environmentally damaging practice of driftnet fishing.
- the US House of Representatives passed Resolution 214 in November 1989 endorsing the Tarawa Declaration. As part of this endorsement the US notified its intention to cooperate with South Pacific regional organisations to formulate an international convention banning driftnet fishing in the region.

(ii) UN Resolutions to ban driftnet fishing 1989: Resolution 44/225

In November 1989, at the 44th session of the United Nations General Assembly, the United States and 16 other states tabled a resolution which expressed the belief that high seas driftnet fishing operations were (a) taking excessive catches of some highly migratory species targeted for exploitation in the North and South Pacific oceans; and (b) having a severe impact on incidentally caught species (marine mammals in particular). The Resolution was co-sponsored by Australia, Bahamas, Canada, Fiji, Mauritania, Mexico, New Zealand, Papua New Guinea, Solomon Islands, Sweden, Vanuatu and Zaire.

The resolution called for a complete ban on driftnet fishing in the South Pacific. Following negotiations with distant water fishing nations who conducted driftnet fishing, Resolution 44/225,

was adopted. The resolution notes that driftnet fishing on a large scale threatens the effective conservation of marine mammals and highly migratory fish, and that states are under a duty to cooperate to protect such species. It was resolved that:

- a moratoria be placed on all large scale pelagic driftnet fishing on the high seas by 30 June 1992, unless effective management and conservation measures were taken, based on statistically sound analysis;
- immediate action be initiated to reduce large scale pelagic driftnet fishing in the South Pacific and this method of fishing in the region no later than 1 July 1991, as an interim measure until appropriate conservation and management arrangements for South Pacific albacore tuna resources are entered into by all concerned parties; and
- there be an immediate cessation of the expansion of the large scale pelagic driftnet fleet in the high seas in the North Pacific.

(iii) UN Resolution 46/215 (1991)

In Resolution 46/215 which was adopted on 20 December 1991, the United Nations General Assembly called for a world wide moratorium on all high seas driftnet fishing by December 1992 in all the world's oceans, including enclosed seas and semi-enclosed seas. The Resolution specifically encouraged all members of the international community to take measures individually and collectively to prevent large scale pelagic driftnet fishing operations on the high seas of the world's oceans and seas.

Fisheries implications

The Tarawa Declaration and the UN Resolutions on driftnet fishing provided the diplomatic background to the Convention on Driftnet fishing which prohibited the use of driftnets longer than 2.5 km within the EEZs of South Pacific nations, including those of Australia and New Zealand.

2. Agenda 21 (UNCED, 1992)

Agenda 21 is the programme of action agreed to by States during the Rio United Nations Conference on Environment and Development in 1992. The part of Agenda 21 that directly deals with fishing is Chapter 17. Chapter 17 of agenda 21 is the basis of the current Draft Agreement on Straddling Stocks and Highly Migratory Species and the FAO Code of Conduct. The thrust of Chapter 17 of Agenda 21 is simply to ask the international community to address environmental issues that affect the marine environment in a comprehensive manner. Chapter 17 requires, among other things that States must:

- maintain and restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors and taking into consideration relationships among species;
- minimise waste in the catch of target species, to protect and restore endangered species, to preserve habitats, and, in the case of fishing on the high seas, to ensure the effective enforcement of fishery management measures;
- manage marine living resources under their national jurisdiction with a view to achieving sustainable yields;
- protect and preserve endangered marine species;

- protect fragile ecosystems as well as habitats and other ecologically sensitive areas;
- impose limitations on the use of critical habitat areas;
- ensure that destructive mechanisms used for fishing are prohibited within their national boundaries; and
- ensure that the sustainable use and conservation of marine living resources under national jurisdiction include developing and increasing the potential of marine species for nutritional, social, economic and developmental goals;
- that local communities, indigenous people and small-scale artisanal fisheries are involved in the development of fisheries management programmes.

The Precautionary Principle and Fishing

One of the emerging principles in international environmental and resources law is the Precautionary Principle. This principle which is incorporated in Principle 15 of the Rio Declaration states as follows:

"In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

According to Principle 15 of the Rio Declaration, States are required to adopt the precautionary principle in decision-making with regard to resources management. This is in response to the fact that most fisheries stock are now fully or over-exploited beyond their sustainable levels. Chapter 17 of the Rio Declaration reiterates this principle by stating that approaches to fisheries management should be precautionary and anticipatory in ambit.

There is currently no agreement among States regarding the practical application of the precautionary principle. At the First Substantive Session of the UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (New York 12-30 July 1993) different views were expressed by participants. The European Community, Japan and Korea expressed the view that the precautionary principle applies only to pollution and cannot be applied to fisheries management (Cooke and Earle, 1993). On the other hand, some states argued that the precautionary principle applies in all areas of natural resource management. Countries in this latter group include Australia, Norway, New Zealand, Papua New Guinea, Iceland, Canada, Chile, Indonesia, Trinidad and Tobago, the Solomon Islands and the United States of America.

The following list has been suggested as the standard for a precautionary approach to sustainable fishing (after Cooke and Earle, 1993):

- No new fishery should be established or existing fishery expanded until a scientifically-based management plan has been drawn up that has been shown, by simulation or otherwise, to be capable of ensuring sustainability with high probability under a wide range of possible scenarios with respect to the dynamics of stocks and ecological interactions.

- Management plans that meet the above requirements should be drawn up and implemented for existing major fisheries by the year 2000. A correspondingly later deadline can be set for fisheries which have been stable for 20 years or more.
- The intensity of fishing should not be such as to substantially distort the character of the ecosystem. This objective shall be interpreted operationally to require that each management plan be able to demonstrate high statistical probability that catches do not reduce the average biomass of either target or non-target species by more than 20% compared to the expected average biomass in the absence of fishing, unless a greater removal can be shown not to have a detrimental effect on the ecosystem.
- Where there are insufficient data to determine the likely impact of exploitation of the stocks in order to implement criterion 3, the management procedure shall be such as to ensure that average annual catches of target species do not exceed 1% of estimated stock biomass in any area.
- No fishery shall be established or expanded in the absence of a reliable minimum estimate of the target species biomass.
- No new fishing method, or fishing method new to an area, shall be deployed on a commercial scale until data from experimental fishing with the new method have been obtained and independently evaluated, and have been found to provide reliable estimates of catch rates of non-target species and undersized fish and of physical disturbance to habitat. If the experimental data indicate substantial disturbance to habitat, or excessive bycatches of some species, the fishing method shall not be deployed on a commercial scale until modifications have been developed for reducing the bycatch or habitat disturbance to minimal levels. Whether or not there is evidence of adverse effects, any fishing method used in an area that involves substantial disturbance to habitat shall be excluded from representative closed sub-areas covering at least 50% of the fishing ground, to conserve part of the habitat in its undisturbed state. If the entire fishing ground has already been subject to major disturbance, closed areas covering at least 50% of the fishing ground shall be established to allow recovery of part of the habitat.
- Research shall be conducted to determine the selectivity of gear types in existing fisheries. Where the resulting data indicate that some gear results in excessive catches of non-target species, or undersized individuals of target species, that gear type shall be phased out rapidly, unless modifications have been developed for reducing the bycatch to minimum levels.

Fisheries Implications of the Precautionary Principle

Although the precise scope of the precautionary principle is not clear, it is beginning to have some impact on fisheries policy making at the international level and in Australia. The New South Wales *Fisheries Management Act* 1994 has included the precautionary principle in Section 30 of the Act. One of the factors which the Total Allowable Catch (TAC) Committee is to take into consideration in allocating the TAC is the "precautionary principle", ie "that if there are threats of serious or irreversible damage to fish stocks, lack of full scientific certainty should not be used as a reason for postponing measures to prevent that damage". At the international level, the precautionary approach has been incorporated into Article 6 of the draft Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks.

The Draft Agreement makes a general statement of principle, that States should apply the precautionary approach to conservation, management and exploitation of straddling fish stocks and highly migratory fish stocks in order to "protect" and "preserve" the marine environment and the living marine resources.

The elements of the precautionary approach to fisheries to include:

- they must include all appropriate techniques;
- they must be aimed at setting stock-specific minimum standards for conservation and management taking into account the best scientific information available;
- States must be more cautious when information is poor;
- the absence of "adequate" scientific information shall not be used as a reason for postponing or failing to take conservation or management measures.

The Draft Agreement requires that States apply the precautionary approach in accordance with guidelines which include among others the following:

- in order to improve decision making for fishery conservation and management, States are required to "obtain" and "share" the best scientific information available and develop improved techniques for dealing with risk and uncertainty;
- in determining conservation and management measures, States shall take in account, among other things, uncertainties relating to the size and productivity of the stock(s), precautionary reference points, stock condition in relation to such reference points, levels and distributions of fishing mortality and the impact of fishing activities on non-target and ecologically related species, as well as oceanic, environmental and socio-economic conditions
- in managing fish stocks, States shall consider the impacts of fishing on associated ecosystems. They should develop data collection and research programs to assess the impact of fishing on non-target and ecologically related species and their environment, adopt plans as necessary to ensure the conservation of such species and consider the protection of habitats of special concern; and
- States shall determine precautionary reference points, and the action to be taken if they are exceeded. When precautionary reference points are approached, measures shall be taken to ensure that they will not be exceeded. If limit reference points are exceeded, conservation and management action shall be taken immediately to restore the stock(s) in accordance with pre-agreed courses of action.

3. Draft FAO Code of Conduct for Responsible Fishing

The Code of Conduct is aimed at providing guidelines for responsible approaches to fishing. The idea of such a code was first raised at the 19th Session of the FAO Committee on Fisheries (COFI) in April 1991. At the time, the concerns were related to large scale pelagic driftnet fishing. Present efforts to draft a code for fishing was launched at the International Conference on Responsible Fishing at Cancun in May 1992.

The draft Code covers a number of issues which will affect the manner in which fishing is carried out. These issues include: (a) fisheries management; (b) fisheries operations; (c) post harvest practices and trade; (d) aquaculture development; (e) integrated coastal area management and (f) fisheries research. Consultation on the Code of Conduct is still going on.

Fisheries Implications

The implications of the Code of Conduct for the fishing industry may be summarised as follows:

- Stock should be maintained at a level above the minimum required to secure a high probability of replenishment of the resource. This raises the issue of precautionary management of fisheries as discussed above.
- All stock management objective should also provide a high probability that biodiversity is conserved and food requirements of apical predators in the food chain. This may have implications for fisheries on which some marine species feed for example, Pilchard for Whales or Southern Bluefin Tuna.
- Environmental impacts on the resources from all human activities must be identified, quantified and to the extent necessary and possible, corrected. Here an industry concern should be who pays for this level of knowledge, identification and correction?
- Fisheries management authorities should ensure that exploitation of a previously unfished or very lightly fished stock is not allowed to increase until a plan for rational exploitation of the stock has been agreed. This is not happening in the Australian scene, for example Orange Roughy and more recently the King Crab fishery off Tasmania. This calls for more working harmony and unified action between Federal and States in fisheries management in Australia.
- When Precautionary or limit points are approach, measures should be taken to ensure they will not be exceeded. These measures should where possible be pre-negotiated. If such reference points are exceeded, recovery plans should be implemented immediately to restore the stocks. Is this happening in current fisheries management?
- In the case of new or exploratory fisheries, conservation measures including precautionary catch or effort limits should be established as soon as possible in cooperation with those initiating the fishery and should remain in force until there are sufficient data to allow assessment of the impact of any increase in fishing intensity on the long-term sustainability of stocks and associated ecosystems. This is not current practice and has implications for industry in that reference points should be identified by management and in new developing fisheries. We are deficient in these respects.
- Record of authorised fishing vessels be maintained containing relevant details for every vessels authorised, including type and size of vessel; and that data maintained in the record be used to monitor the capacity of the fleets in terms of catch requirements, capital invested and cost of operation. Both these suggest that better information is required on vessels, vessels characteristics, and market values of vessels than is currently held in many fisheries. This has cost implications for management and would cause valuation problems if enacted.
- Vessels granted authorisations to fish may have such authorisation withdrawn for non-compliance with conservation and management measures. This raises the quality and terms of property in "authorisations" (licences?) and whether vessels that violate the conservation objectives of management could be prosecuted under current domestic fisheries management legislation.
- When allocating resources "States should ensure that local fishing communities and indigenous fishers who have traditionally fished the resources and who are dependent on

the resource for much or all of their livelihood, are given preferential access". This has implications for the Australian scene in line with the Mabo decision and the *Native Title Act*.

- Fisheries management authorities should introduce measures for seriously depleted resources that facilitate their sustained recovery to at least the level of spawning or adult biomass corresponding to the highest natural rate of increase. They should ensure that habitats critical to the well being of the resource which have been adversely affected by fishing or other activities, are restored to a productive condition. National laws should make provision for the opportunity of financial compensation being sought in respect of damages to such habitats for the purpose of restoration. This article addresses restoration and financial compensation being sought to restore fish habitat. Who funds the restoration?

The other part of the Code that is most relevance to industry is post harvest practices and trade regulations (Article 10).

- "...States should ensure the right of consumers to safe, wholesome and unadulterated fishery products." This has implications for additives or substitution and fish naming of products.
- "States should cooperate to achieve harmonisation or mutual recognition of national health standards and certification programmes, and explore possibilities for the establishment for mutually recognised testing and certification agencies". This is different from the current situation where mercury content regulations for species such as swordfish and testing of standards are different in several states of Australia.
- "...Maintaining records that identify the source of fish purchased." There is fish marketed in Australia for which this is not possible.
- "In view of the risks to ecosystems caused by trade in live fish specimens, States should comply with relevant international agreements." Are the fishing and aquaculture industries aware of these?
- "When intending to introduce new laws, regulations and administrative procedures, States should notify other countries concerned, in sufficient time for any comments to be given due consideration."
- When a State introduces changes to its legal requirements affecting fish trade, sufficient information and time should be given to allow the States and producers affected to introduce the changes needed in their processes and procedures. In this connection, consultation with affected States on the time frame of the implementation of the regulations would be desirable. These provisions could be used by Australia as a short term defence should trade sanctions be imposed under US legislation (see Part III below).

PART III : LEGISLATION OF UNITED STATES AFFECTING FISHING

Introduction

The United States of America (US) is one of the world's largest importers of raw and processed fish products. The large US market provides export income for many countries whose coastal waters are rich in fisheries resources or whose fishing vessels catch non-domestically consumed fish in the world's oceans. Over the years, the US has taken advantage of its dominance of the world fish market to exert control over foreign states' fishing practices both within waters under US jurisdiction and on the high seas. This has been achieved by enacting trade embargo and restricted access provisions into domestic legislation, which potentially leave foreign states without an export market if they fail to comply with US policy and law. The circumstances under which these restrictions apply fall into two categories. These are: (a) access to tuna in other states' EEZs; and (b) the protection of marine mammals. This section of the report describes the relevant US legislation on these issues.

The Fishermen's Protective Act, 1954 (as amended).

This legislation was first passed in 1954 with the aim of protecting American fishers against enforcement actions taken by some Latin American countries in their extended zones of fisheries jurisdiction. The legislation gives power to the Secretary of State to provide compensation for losses incurred by US fishers whose vessels are seized by foreign governments for violations of fishing laws that regulate territorial claims not recognised by the US. Compensation covers losses incurred in securing the release of the vessel or crew, actual out of pocket cost including loss of income and costs resulting from the destruction or loss of vessels or gear. Subsequent amendments to the Act empowered the US government to deduct an amount equal to the loss claimed by US fishers from the foreign country's aid appropriation.

The Fishery Conservation and Management Act (Magnuson Act), 1972.

The *Magnuson Act* provides that the US would not accept any claims to fisheries jurisdiction beyond the territorial seas if claimants fail to accept that highly migratory species (especially tuna) are to be managed by applicable international fishery agreements. The Act also provides for an embargo on the importation of fish products into the US market. The embargo may be enforced in the event of any attempt to prevent US vessels from fishing for tuna within a coastal State's EEZ and any seizure of US fishing vessels involved in fishing for highly migratory species without a license.

The imposition of an embargo follows a two step procedure. First, the Secretary of State must determine whether the events that could trigger the sanction had occurred. Second, the Secretary of State must certify such a determination to the Secretary of the Treasury. Upon receipt of this certification, the Secretary of the Treasury is required to immediately take such action as may be necessary and appropriate to prohibit the importation into the United States:

- of all fish and fish products from the fishery involved, if any; and
- upon recommendation of the Secretary of State, such other fish or fish products, from any fishery of the foreign nation concerned, which the Secretary of State finds to be appropriate to carry out the purpose of the legislation.

The embargo may only be lifted once it is determined that the reason for the imposition of the ban no longer exists.

In May 1991 the US House of Representatives voted in favour of regulating the harvest of tuna within the 200 mile EEZ of the US. This led to an amendment of the *Magnuson Act*. The amended section reads:

The United States shall cooperate directly or through appropriate international organisations with those nations involved in fisheries for highly migratory species with a view to ensuring conservation and promoting the objective of optimum utilisation of such species throughout their range, both within and beyond the EEZ.

This is a significant departure from the US previous stance and one that the US tuna industry contends would make it more difficult for the State Department to bargain with foreign countries for the US tuna fleet to fish in other countries' waters. The amendment entered into force on 1 January 1992. At the time of writing this report it is not clear what the effect of this change will be on US tuna policy. The fact that the relevant sanctions of the *Magnuson Act* and the *Fishermen Protective Act* remain in operation places the US tuna industry in a very strong position of power when negotiating fisheries access agreements with foreign countries.

Marine Mammals Protection Act, 1972.

This legislation was enacted in response to public pressure on the US Congress to reduce the direct and incidental by-catch of marine mammals in connection with the harvesting of fish. The purpose of the legislation is to achieve the conservation of marine mammals which may be in danger of extinction or depletion. The Act prohibits the "taking" (defined to include harassing, hunting, capturing or killing of any marine mammals). So far, the Act has been applied primarily to the protection of dolphins from purse seine fishing.

The *Marine Mammals Protection Act* applies to all fishing activities within the waters under US jurisdiction and to all "takings" by persons or vessels subject to the jurisdiction of the US anywhere on the world's oceans beyond coastal states' territorial seas. The legislation prohibits US flag vessels engaged in any commercial fishery from using any method of fishing contrary to regulations under the Act and from using a port or other place within the jurisdiction of the US.

Although the immediate goal of the legislation is stated as the reduction of incidental kills to insignificant levels approaching a zero mortality and serious injury rate, the Act also allows for the incidental taking of cetaceans in the course of commercial fishing operations pursuant to regulations and permits. Exceptions are also made to allow the taking of such species for scientific research, public displays and other purposes consistent with the Act.

The *Marine Mammal Protection Act* also grants the Secretary of the Treasury the power to ban the importation of fish or fish products caught by foreign vessels in waters outside the jurisdiction of the US if the technology used results in cetacean deaths or injury at rates that exceed those allowed by US standards.

The *Marine Mammal Protection Act* was amended in 1984 and again in 1988. Under the amendment, tuna-fishing nations are required to comply with a number of requirements in order to be able to export yellowfin tuna and yellowfin tuna products into the US. These requirements are as follows:

- the tuna-fishing nation must provide documentary proof that it has instituted a regulatory programme in respect of the taking of marine mammals which is comparable to the US programme;

- the average rate of the incidental taking by vessels of the harvesting nation must not be more than double that of US vessels during the same period by the end of the 1989 fishing season and no more than 1.25 times that of United States vessels during the same period by the end of the 1990 fishing season and thereafter;
- the total number of eastern spinner dolphins incidentally taken by vessels of the harvesting nation during the 1989 and subsequent fishing seasons must not exceed 15 percent of the total number of marine mammals incidentally taken;
 - the State must demonstrate that its fleets do not engage in the practice of the encirclement of pure schools of cetacean on sundown sets and on other activities prohibited by US law.
- The State must engage in monitoring through a reliable observation program and comply with reasonable scientific research requests by the US Secretary of Commerce.

The wider implication of the *Marine Mammals Protection Act* is that any fishing nation that fails to meet the requirements noted above will not be able to sell its fisheries products in the US. Two types of embargo may be imposed. The first is a primary embargo. This type of embargo prohibits the importation of that country's yellowfin tuna and yellowfin tuna products to the US. Within 90 days of the imposition of a primary embargo, a secondary embargo can be imposed on yellowfin tuna and yellowfin tuna products from any intermediary country trading with the country under embargo and the US, if the intermediary country does not ban tuna imports from the country under a primary embargo within 60 days. Since 1990, a number of embargoes have been imposed on tuna fishing nations whose vessels operate in the Eastern Pacific. Embargoes have been imposed on countries such as Colombia, Ecuador, Mexico, Panama, Spain, Vanuatu and Venezuela.

The Pelly Amendment, 1973.

The *Pelly Amendment* was enacted in 1973 primarily to address the depletion of the North Atlantic salmon population. However, the Amendment is broadly worded and applies to the enhancement of any international fisheries conservation program to protect whales. *The Pelly Amendment* gives the President a discretion to impose an embargo on all fish products imported from a foreign state in support of an international conservation program regardless of whether that species being protected is under threat of over exploitation. Unlike under *the Marine Mammals Protection Act*, however, the prohibition and sanctions under the *Pelly Amendment* may only be enforced if they are in accordance with the General Agreement on Tariffs and Trade (GATT).

The Driftnet Impact Monitoring; Assessment and Control Act, 1987.

This legislation requires the Secretary of Commerce to initiate agreements with foreign nations which engage in driftnet fishing in the North Pacific Ocean for the purpose of effective enforcement of laws, regulations and agreements that prohibit driftnet fishing. A failure by the foreign nation to enter into an agreement and to adequately implement such agreement will result in the imposition of embargo under the *Pelly Amendment*.

The Driftnet Act Amendments Act, 1990.

The *Driftnet Act Amendments Act* has three objectives, namely: (a) to implement the moratorium called for by the United Nations General Assembly in Resolution 44/225; (b) to support the South Pacific Driftnet Convention; and (c) to secure a permanent ban on the use of destructive fishing practice, and in particular large-scale driftnets, by persons or vessels fishing beyond the EEZ of any nation.

In compliance with this legislation, the Secretary of Commerce is required to submit a report to Congress containing, *inter alia*, a list of States that conduct, or authorise their nationals to

conduct, large-scale driftnet fishing beyond the EEZ of any nation in a manner that diminishes the effectiveness of or is inconsistent with any international agreement governing large-scale driftnet fishing to which the US is a party or otherwise subscribes. A State included in this list is required to be certified. Such certification is deemed to be a certification for the purposes of the *Pelly Amendment*. This means that if any distant water fishing nation continues to use driftnets in the South Pacific after the July 1, 1991 or in any other region after the 30 June 1992, this would be diminishing the effectiveness of an international fishery conservation program as defined by the *Pelly Amendment* and the Secretary of Commerce would be required to certify such facts to the President. *The Driftnet Acts Amendment* applies the embargo provisions contained in *the Marine Mammals Protection Act* to states who persist in using large-scale driftnets on the high seas. The embargo may be imposed in circumstances where the US quantity standard is exceeded. The US quantity standard for incidental taking by high seas driftnet technology is now zero.

High Seas Driftnet Fisheries Act, 1992.

The purpose of this Act is to implement United Nations General Assembly Resolution 46/215 which has already been described. The Act also attempts to secure a permanent ban on the use of destructive fishing practices, and in particular large scale driftnets, by persons or vessels beyond the EEZ of any coastal State. The legislation:

- provides for the denial of port privileges and sanctions for high seas large scale driftnet fishing. Within 30 days of the enactment of the Act and periodically thereafter, the Secretary for Commerce, in consultation with the Secretary for State, is required to publish a list of States whose nationals or vessels conduct large scale driftnet fishing beyond the EEZ of any nation.
- empowers the Secretary for the Treasury, in accordance with recognised principles of international law, to withhold or revoke the clearance for any large scale driftnet fishing vessel. However, before this action is taken, the Secretary of State is required to inform each State affected of any sanctions that may be imposed on it if its nationals or vessels continue to conduct large scale driftnet fishing beyond the EEZ of any coastal State.

Within 30 days after a State is identified as a violator, the US President is required to enter into consultations with the government of that State for the purpose of obtaining an agreement that will facilitate the immediate termination of large scale driftnet fishing by nationals or vessels of that nation on the high seas.

Where consultations are not satisfactorily concluded within ninety days, the US President is required to direct the Secretary of the Treasury to prohibit the importation into the US of fish and fish products and sport fishing equipment from the offending State. The prohibition is to be implemented within forty-five days from the day which the Secretary receives direction from the President.

The *High Seas Driftnet Fisheries Act* also amends the *Fishermen's Protective Act* by enlarging the scope of products which may be restricted into the US. It also expands the term "United States" to mean the several States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands, and every other territory and possession of the US.

The International Dolphin Conservation Act, 1992 (and the Dolphin Protection Consumer Information Act, 1992).

This legislation is directly linked to the *Marine Mammals Protection Act* and calls for a 5 year moratorium on the killing of dolphins with purse-seine nets, beginning 1 March 1994. The moratorium is not expected to take effect unless at least one other major fishing country with an active purse-seine fishing fleet of 20 or more vessels agrees to comply with the terms of the moratorium. Any country subject to embargo under the *Marine Mammals Protection Act* will have that embargo lifted if the country agrees to implement the moratorium. However, if the country fails to apply the moratorium by 1 March 1994, all the yellowfin tuna and yellowfin tuna products of that country and up to 40 percent of the aggregate value of other fish products of the country to the US would be banned.

The Act also requires that (a) observers be placed on all vessels in all areas of the world in which it is determined that there is a regular and significant association between marine mammals and tuna; (b) a ban be imposed on the encirclement of eastern spinner and coastal spotted dolphins and (c) US citizens refrain from selling, purchasing, transporting, or shipping to the US, tuna caught in association with dolphins.

The *International Dolphin Conservation Act* is supplemented by the *Dolphin Protection Consumer Information Act* which mandates the use of a "dolphin safe" label on all cans of tuna that have not been caught in association with dolphins.

Implications for fisheries of US domestic legislation

Given the dominance of the US market for fisheries products, any fishing nation wishing to take advantage of the US market would need to be familiar with the fisheries conservation legislation of the US that have been described in this section. Failure to comply with these requirements may result in trade embargoes being applied against the countries concerned. Although it has been determined that the US legislation is contrary to international trade law, currently there is no indication that the US intends to change its domestic legislation to comply with international law (see next section below).

Section B: Fisheries trade and the environment.

This section commences by examining recent GATT decisions and fisheries environmental issues. It also discusses the general issues of fisheries trade and the environment.

Trade instruments and the environment- recent GATT decisions

International trade among nations is regulated by an agreement called the General Agreement on Tariffs and Trade (GATT). The main aim of the GATT is the liberalisation of international trade and the prohibition of discrimination and the imposition of unilateral sanctions by individual countries (the GATT will soon be superseded by the World Trade Organisation, WTO). Generally, the provisions of GATT prohibit the use of import quotas and other restrictions on quantities (such as quotas) on imports. The international trade in fish also comes within the GATT rules. The only exception is where the import restriction is related to a health concern. Even so, such health measures are to be applied without discrimination.

The tuna-dolphin controversy and the GATT Rulings

Over the years, the US has imposed trade embargoes on the importation of tuna and tuna products from tuna fishing nations and intermediary nations under the *Marine Mammal Protection Act* and other related domestic legislation of the US which have been described above. Countries affected by such import bans have argued that the US unilateral action amounted to a violation of its GATT obligations. The GATT Panel has so far considered two disputes.

Mexico-United States Dispute (1991).

The first dispute was between Mexico and the US. Following the imposition of embargo on the importation of yellowfin tuna and yellowfin tuna products from Mexico for the failure of its flagged vessels to comply with US dolphin conservation measures, Mexico challenged the legality of the embargoes imposed by the US under the *Marine Mammal Protection Act* and the *Dolphin Protection Consumer Information Act*. Mexico argued that the US embargo was an unlawful disruption of international trade and was protectionist in nature.

In September 1991, the special GATT Disputes Panel found that the provisions of the *Marine Mammal Protection Act* under which prohibitions on imports of tuna products are imposed were contrary to GATT. The intermediary nation provisions of the *Marine Mammal Protection Act* were also considered to be contrary to the GATT. The panel recommended that the US brings these measures into conformity with the GATT.

European Economic Community and the Netherlands v. the USA (1992).

In July 1992, the European Economic Community (EEC) and the Netherlands sought a ruling by the GATT panel on the legality of US trade restrictions to enforce *the Marine Mammal Protection Act*. The EEC and the Netherlands argued that the unilateral import prohibitions on tuna and tuna products by the US under its domestic legislation amounted to quantitative restrictions and therefore were contrary to the GATT. The EEC and the Netherlands were supported in their argument by Australia, Canada, New Zealand, Japan, Thailand and Venezuela.

In May 1994, the GATT Panel ruled against the US. As in the case with Mexico, the Panel found that the primary and intermediary import prohibitions by the US on tuna and tun products under the *Marine Mammal Protection Act* were contrary to the relevant provisions of the GATT.

Fisheries Implications of GATT Rulings

These GATT Panel decisions affirm that at present, international trade law does not allow the unilateral use of trade measures by any country to compel other countries to comply with domestic conservation measures imposed by that country. This means that it is against international law for any state to prohibit the importation of fisheries products in an attempt to enforce its domestic environmental laws. However, collective international trade measures can be used to enforce international conservation measures. Examples of such measures include trade restrictions as under the Driftnet Convention and CITES.

The environment and fish trade.

International trade in fish and fisheries products may have both positive and negative effects on the environment. However fisheries trade in itself is not the root cause of the fisheries problem which is due to the market failing to value fishery and environmental resources properly, and the failing to internalise environmental costs in the prices of goods and services. Government failure is also behind the fisheries problem as they often do not correct for market failures (OECD, 1994). International trade is increasingly being used as a way to try and correct market and government failures internationally. However environmental trade may actually exacerbate environmental problems where these failures exist. Good fisheries management which addresses market failure is a central part of the environment and fisheries trade debate.

Market failures.

Fisheries environments are increasingly being affected by pollution from industrial firms which externalise their production costs by using the environment as a free waste sink. Similarly markets tend to under value the worth of ecosystems, counting only the value of the product of extractive industries as reflected in the price of the product. The valuation should include the direct, indirect values, existence and option values. An example of this would be to value the Great Barrier Reef Marine Park only on the basis of its extractive uses (eg. fisheries and tourism). To do so would ignore its existence and option values, which value its bio-diversity and contribution to the welfare of this and future generations.

Property rights

Ill-defined property rights in open access fisheries lead to over-exploitation of the resource. Thus the resource is degraded and may also lead to the loss of the use of the resources to future generations. Similarly nations can take resource decisions that fail to account for the costs and benefits to the world as a whole. This is a problem in the management of straddling or highly migratory resources, and the management of the high seas where a wider view than just single nation benefits must apply (OECD, 1994).

Economists suggest the enhancement of property rights to address the common property problem in fisheries. This can address the market failure and may provide an incentive for fishers to look after the environment. There is little evidence that enhancement of property rights will automatically leads to greater environmental integrity, but they may promote more controlled and rational use and thus be an important tool in achieving more responsible fisheries management.

Intervention failures

Intervention failures occur when government policy intervention fails to correct for or further exacerbates market failures. Subsidisation is an example in the global fishing industry where government capital and operational subsidies can lead to generation of a greater amount of fishing effort than in the free market. This in turn promotes unsustainable use of fish resources and overfishing.

Subsidies have been a major problem in global fisheries. In promoting exports there have been international examples of subsidies being given to ground fish, shrimp and tuna fishers (Sen, 1994). These subsidies cause greater entry to the fishery than under the free market case and lead to fisheries management and environmental problems. Australia has a general subsidy for fuel to primary producers and in the past has had vessel import policies that have led to over capitalisation (eg. the Northern Prawn Fishery). Currently a National Fisheries Adjustment Program is investigating a consistent approach to fishery restructuring between states in Australia (SCFA, 1995).

Trade barriers

Tariffs and non-tariff barriers may also constitute policy intervention failures which exacerbate existing market failures and intervention failures of environmental policies. For example the import tariff applied to unprocessed products by most developed countries are lower than the tariffs applied to semi-processed and processed products (Sen, 1994). These tariff differentials can contribute to over-exploitation and fish stock depletion when exporting countries increase their fresh and frozen fish exports to maximise foreign exchange receipts without implementing proper fisheries management controls.

Product effects.

Negative product effects come from trade in a good that will be detrimental to ecosystems, for example the trade in an endangered species. The consumer demand for endangered species can come from abroad and lead to illegal trading activity. Process and Production Methods (PPMs) are give rise to product effects, for example fisheries bycatch which is incidental to the fishing process.

If trade has been affected by subsidisation or differential tariff rates on product forms, then the liberalisation of trade can be positive for the environment. However if fisheries management practices are unsound, then the liberalisation of trade measures may only lead to more destruction of the environment.

Tariff barriers.

Under GATT tariffs are preferred to quotas and approximately 80% of international trade in fishery products is GATT bound (Sen, 1994). Generally tariffs for processed or semi-processed fishery products are higher than for unprocessed fishery products. The global environmental concern with tariff rates is that developing countries get preferential tariff rates from exporting unprocessed products to developed country markets. The higher tariffs on processed products do not account for weight losses in processing and thus the effective difference between a 10% nominal difference in tariffs between cod and cod fillets may be an effective difference of between 43 and 52% when weight loss is considered (OECD, 1985). Thus the international tariff structure may lead to raw resource bearing countries exporting more fish in raw material form than desirable. Where there is poor fisheries management the tariff structure may contribute to resource depletion (Sen, 1994).

Non-tariff barriers and sanitary and phyto-sanitary regulations.

Non tariff barriers (NTBs) are usually health and hygiene regulations or administrative procedures that may constitute an impediment to foreign exporters forwarding fishery products. A review of Non-Tariff Barriers faced by Australian seafood products is given in Dennis and Battaglione (1995). It is apparent that all Japanese fishery products are subject to non-tariff barriers.

Munro (1995) reviews the NTBs for several countries and suggests that Sanitary and Phyto-Sanitary (SPS) measures can impede imports. They tend to be less general and are in place by countries against perceived or actual SPS threats. SPS measures will have a much greater influence on the products of aquaculture than wild fisheries due to contaminants residing in many traded aquaculture products (Srisomboon and Poomchatra, 1995).

Sen (1994) gives an example of a country rejecting the import of foreign produced fish which are under the size limits imposed in domestic fishery management legislation. It is possible that another countries attempts to manage fisheries and protect the environment under domestic law may have implications for foreign producers and constitute a non tariff barrier to trade, having an environmental origin. This was the case of US the tuna-dolphin legislation and the problems with the GATT as previously discussed.

Discussion

There is increasing concern that the free trade philosophy of GATT may have significant ramifications for the marine environment. Currently in Australia the role of the (Australian Quarantine Inspection Service (AQIS) in preventing the importation of fish and fishery products from abroad is being debated. The import ban has historically been advocated to preserve Australia's disease free status. The global liberalisation of trade under the GATT means that imports from abroad could lead to exotic diseases and organisms, such as viruses, entering the marine environment. This could be to the detriment of native species and thus impact aquaculture and fishing industries. The importation of fresh Atlantic Salmon from abroad may have ramifications for the domestic aquaculture industry. Similarly there has been concern that the import of frozen fish used as aquaculture feedstuffs may introduce exotic diseases.

It is clear that there are inherent philosophical problems in reconciling the GATT and international environmental instruments which indicate the need for the precautionary management of the marine environment and the preservation of marine biodiversity. Free trade may be in the interests of greater economic efficiency with the immediate benefits in the standard of living of the Australian community, but it may also lead to the erosion of the integrity of the marine environment and to the deterioration of our environmental comparative advantage. This could have long term implications for both the fishing and aquaculture industries and will require national and international debate.

Conclusions on fisheries trade and the marine environment.

In this section it is apparent that the threat of unilateral action from countries such as the United States on an environmental basis is contrary to international agreements such as the GATT and the evolving World Trade Organisation. However this does not preclude the possible embargo of foreign products to the US under domestic legislation.

The wider problems in fisheries trade fall into two categories: those that can be solved by better fisheries management practices: and barriers to trade, of which non-tariff barriers and sanitary and phyto-sanitary measures have the capacity to develop into considerable problems in their relationship to GATT. With the advent of international environmental instruments the debate will inevitably widen from the current position where GATT is pre-eminent. Industry should form policy to protect the marine environment in the long term and should monitor the development of non tariff barriers and SPS requirements of our trade partners, particularly for our aquaculture products.

Section C: Implications and Conclusions

In this section the implications of the international instruments described in section A will be evaluated and conclusions drawn.

Opportunities -threats and environmental instruments.

The effects of the international environmental instruments identified are analysed in this section following the binding and non-binding approach of Section A.

Table 1 summarises each of the binding instruments in respect of the main implications for fisheries management. Table 2 examines the features of the non-binding instruments.

Numerical grading of Table 1 leads to the following ranking of key issues in the binding instruments:

- (i) Conservation and optimum utilisation
- (ii) Conservation of Areas as a management tool
- I (iii) Endangered species and catch prohibition
(though only two conventions have formal listing)
- (iv) Rehabilitation/restoration of species/stocks

The following issues occur less frequently in the binding instruments:

- (v) Bycatch issues
- II (vi) Banning of fishing methods
- (vii) Trade issues

Finally, the precautionary principle has not been around for long enough to make a substantial impact on binding instruments:

- III (viii) Precautionary principle

In Table 2 the analysis of non-binding instruments notes the following issues occur most frequently:

- (i) Area closures
- (ii) Bycatch/incidental species
- I (iii) Protection of endangered species
- (iv) Restoration of endangered species
- (v) Banning of fishing gear

The following are mentioned less frequently, but are no less important:

- II (vi) Management plans required
- (vii) Precautionary principle

The dominance of threats are also apparent in the Appendix Tables A1, A2, and A3. The Tables review the threats and opportunities for the fishing industry by sector (A1), areas (A2), fishing methods (A2) and species groups (A3). The threats vary, but are diverse as previously identified: bycatch, endangered species, area closures, and limitations on fishing methods.

TABLE 1: THE MAIN FEATURES OF BINDING INSTRUMENTS.

	Conservation of fish & adopt management measures	Optimum utilisation	Conservation of areas	Endangered species/potential prohibition of species capture	Adopt measures for rehabilitation of a species	Banning fishing methods or practices	By-catch	List species	Trade	Precautionary principle
LOSC	X	X	X	X		X	X			
RAMSAR			X	X	X					
BIODIVERSITY	X		X	X	X		X			X
CITES				X				X	X	
DRIFTNET CONVENTION	X					X	X		X	
MIGRATORY (BONN)	X		X	X	X		X	X		
WORLD HERITAGE			X		X	X				
SBT CONVENTION	X	X							X?	
CCAMLR	X	X	X	X	X	X	X			
HIGH SEAS COMPLIANCE			X			X				X
SS/HMS CONVENTION	X	X		X	X		X			X
Number of features	7	4	7	7	6	5	6	2	2	3

TABLE 2: FEATURES OF NON-BINDING INSTRUMENTS

	Banning of specific species capture	Area closures	Minimise catch/incidental species take	Protect en-angered species	Restore endangered species	Management plans required	Precautionary principle
TARAWA DECLARATION (Driftnets)	X						
UN RESOLUTION ON DRIFT NETS	X	X	X	X			
AGENDA 21		X	X	X	X	X	X
PRECAUTIONARY PRINCIPLE	X	X	X	X	X	X	N/A
FAO CODE OF CONDUCT	?	X	X	X	X	X	X
Number of features	3	4	4	4	3	3	2

Conclusions from the study.

The study has shown that international environmental instruments affecting fisheries can be divided into two categories: those that are binding and those that are non-binding (referred to as "soft law"). The binding instruments can be further sub-divided into those that address fisheries directly and others of general application but have indirect implications for the fishing industry. The ones in the latter category pose more serious threats to the fishing industry because they were initially conceived as applying to terrestrial problems (CITES, Bonn Convention, Biodiversity, and World Heritage) and are open to different interpretation in terms of their application to the marine environment. It is in the interest of the industry to monitor any domestic policy to implement the non-fishery specific instruments.

From the overview, it is apparent that the objectives of fisheries management such as "conservation" and "optimum utilisation" of resources are stated in many binding instruments and that issues in the second wave of "soft law" instruments are more problem specific e.g. protecting species, restoration, banning of specific gears, minimising bycatch and specific actions in management plans. Thus the trend identified in the instruments is that they are moving from general objectives in currently binding agreements to more specific constraints and management methods in subsequent "soft law" instruments.

The review shows that the major issues for industry are:

- (i) the interpretation of "*conservation and optimum utilisation*" - despite these terms having been around for some time their practical implications are not clear.
- (ii) *conservation of areas* is ranked highly in both types of instruments. This has implications for vessel access.
- (iii) *endangered species protection and restoration* has implications for closure of areas, banning of fishing methods, and bycatch legislation.
- (iv) *greater detail in the management planning process* for example with reference points and the precautionary principle.
- (v) there is a trend in the "soft law" instruments towards *a shifting in the burden of proof*. Thus the industry may have to prove that fishing practices are not damaging to the environment rather than government proving that they are.

All of the above can be classified as short term threats to the industry. However the long term benefits should flow to the industry from greater sustainable harvests. This may not be the case where other fishing sectors, such as recreationalists, may benefit from changes in the commercial fleet catch. Allocation is an important issue in the wake of these potential changes.

The tightening of environmental constraints in fisheries management will be gradual though the diversity of issues make the time for implementation of policies uncertain. The political and moral power of the "soft law" instruments are unpredictable. The "soft law" instruments may become binding given time. Elements of "soft law", such as the precautionary principle and endangered species provisions have already been included in national legislation in Australia (for example the precautionary principle in NSW fisheries legislation, and endangered species declaration under the national *Endangered Species Act, 1992*).

Trade instruments may be the sanctions used by other countries to enforce environmental concerns such as bycatch, fishing method or endangered species. The trade threat can be minimised by addressing these issues through fisheries management. If there are any short term benefits or opportunities apparent they will be from conforming to environmental instruments and trying to obtain any gain available from consumers. This may require an in depth study of the *niche* markets available for high quality environmentally friendly product.

Trade sanctions in the form of Sanitary and Phyto-Sanitary (SPS) regulations and food residue legislation could affect nearly all species in the form of non-tariff barriers. The industry must also be aware of the inherent conflict between the GATT and the protection of the marine environment under international environmental instruments. Unilateral actions by countries in extending fishing zones are now less likely due to the conclusion of the negotiations on high seas fishing, highly migratory species and straddling stocks.

There are few opportunities for the industry that are immediately apparent. It is recognised that there will be long term benefits in keeping a clean environment, but higher short term returns may be forthcoming from conforming to the eco-labelling preferences of discriminating consumers, probably in foreign markets. Other opportunities for industry may be in getting local authorities to adopt standards in limiting pollution of the coastal area. This will protect the fisher's most fundamental long term asset- the marine environment.

Section D: Strategic questions for the fishing industry.

The impact of International Environmental Instruments on the Fishing Industry.

The fishing industry, fishing practices and trade in fisheries products will be influenced substantially by environmental instruments in the future. The practical outcome of this for fisheries management is an exacerbation of issues that have previously surfaced in fisheries management, for example: allocation disputes, closure of areas, and reduction or prohibition of catch. Many of these issues will re-occur in the future with more weight in international law, national law, and with a new political and moral force.

The apparent advent of environmental issues in fisheries management has been overstated by the Ecologically Sustainable Development literature which has often focused on a change in ethic, rather than specific policies. Fisheries managers have often been disciplinary specialists in marine biology/ecology or fisheries science. However they have been restricted by socio-political constraints from taking a stronger environmental position. Given the practicalities of resource allocation, reducing over-exploitation and industry restructuring, the implementation of environmental changes will not be costless or painless.

Revisiting fisheries management issues

Fisheries management has been based around maintaining the fish stock, their environment, and the economic well being of the commercial fishing industry and other user groups. The review of international environmental instruments has indicated that:

- the conservation and optimum utilisation of fish stocks is a key obligation for managers;
- certain fisheries habitats should be conserved;
- regulations on fishing methods and species captured are required to protect endangered species and address bycatch issues;
- restoration of fish stocks is essential;
- management plans should be more comprehensive and include more reference points, switching points and performance indicators required by decision makers.

Few of these points are new to fisheries managers, but they are now part of our international obligations and may also come into national law. Many of the issues are central to the precautionary approach to fisheries management and management plans will increasingly reflect the precautionary principle. The binding and non-binding instruments call for better implementation and control of the harvesting strategies by industry with plans being phased in, in the development of new resources.

Enhanced management plans will require more information from fisheries science than is currently available and will re-open debates on the cost of management information. The funding of research and information required for management will continue to be a key issue as a consequence of international environmental instruments.

The quality of science is also an issue as in many fisheries as we see the good science-bad science debate taking place, for example the Northern Bluefin Tuna fishery (Drumm, 1994). Risk assessment and biological reference points will be a central part of the scientific debate. In international trans-boundary fisheries the harmonisation of science between nationalities is a

significant issue. The answer is harmonisation with international standards, but this has been a major challenge for scientists. It has also been a major problem in international trade and fish trade where different standards apply between nations (OECD, 1994. see Harmonisation of Science in Annex1).

The declaration of closed areas, endangered species, and endangering fishing practices have been controversial issues in the past. The process used to close an area or to declare an endangered species is in need of greater transparency and a consistent approach between countries and across different government agencies.

One of the most difficult issues is appraising environmental integrity or environmental quality. How accurately can these be measured? The incorporation of environmental integrity indices as in management plans require examination of eco-auditing or eco-accreditation of fisheries environments as performance indicators of environmental stewardship. The practicalities of this are unclear. The means for payment of eco-audits are not within current industry or government fishery management budgets. Eco-accreditation will also pose debates on the role of science in the management process similar to the debates on good and bad science in stock assessment.

Over-capitalisation in fisheries has been promoted by government subsidies and restructuring has been difficult. As part of the sustainable development process, over capacity in the fishing industry should be reduced. Restructuring mechanisms are currently the subject of a national review (SCFA, 1995). Restructuring has required access rights and enhancement of ownership and property rights in fisheries. Potentially, enhanced ownership of the resource may lead to more responsible use of the fisheries environment as fishers have a designated stake in the future well being of the fishery. However substantial restructuring of industry will also generate rent which may be vulnerable to collection by management. This creates a 'catch 22' for industry in that the restructuring of industry to achieve sustainable / environmental objectives may lead to individual fishers being worse off due to rent collection. Policy on rent collection should be reconciled with the government's push for ecologically sustainable development. A moratorium on rent collection would assist industry restructuring and could be used as an incentive to upgrade the environmental performance of industry.

Fisheries management will also have to confront the bycatch issue as part of their international obligations. Bycatch is a major problem in fisheries management if only due to the now well established and possibly increasing public profile on the issue. Bycatch can be split into trawling and non-trawling issues, for example TEDs (Turtle Excluding Devices) are a trawling issue whereas seabird mortality in longlining is not.

The technical fix solution involves the development of TEDS or Bycatch Reduction Devices (BRDs) (Crowley, 1994). Legislation can be applied to address specific cases, for example dolphin kills under Australian legislation lead to large fines for taking protected species. A quantitative limit on bycatch has a similar disincentive and has been used in the US Tuna /Dolphin Management (Warren, 1994e). These measures call for 100% levels of observer coverage. This is another payment issue for government and industry.

With international environmental instruments it is evident that the complexity of fisheries management will increase and the number of policy making bodies involved in developing environmental fisheries policy will also be larger. The interface of fisheries management with fisheries trade issues is a recent development and calls for fisheries managers to be aware of some of the policy mechanisms and processes recommended by trade bodies like the OECD (1994, see Annex 1; Procedural guidelines on integrating trade and environmental policies: (a) Transparency

and consultation; (b) Trade and environmental examinations, reviews and follow up; (c) International environmental co-operation; (d) Dispute settlement).

Greater transparency is needed in the development of policy which will have ramifications for the fishing industry. This should also include consultation with the fishing industry and calls for the fishing industry, all relevant government agencies, and appropriate NGOs to be part of the policy making process. Availability of information on which decisions are being implemented is paramount and there should be a dispute settlement procedure set in place. A process should be established so that potential sanctions and effects of national and international legislation can be considered. Such mechanisms do not seem to be in place at the moment.

Strategic questions for the fishing industry in the light of international environmental instruments.

In this section strategic questions for the fishing industry are raised in the light of international environmental instruments. The policy question will be indicated and potential actions discussed. The issues are divided into *internal and external* issues for the fishing industry. It should be noted that the contents of this section have been discussed with industry and represent questions that need to be addressed by industry policy and action in the future.

Internal issues for the fishing industry.

1. Can the fishing industry ignore international environmental instruments?

Ignoring international environmental instruments is not a sensible strategy given the potential ramifications of trade, foreign policy implications, bycatch issues and the many legislative obligations that need to be addressed to by Government. The scale of these international environmental instruments and obligations may be beyond the influence of local or federal politicians. Ignoring the international threat will not lead to a long-term sustainable fishing industry. Similarly, actions on the international stage is often a precursor to action in national legislation.

Action:

The industry must realise that international environmental instruments are here to stay (and may also be the precursor to national legislation). The industry requires a policy position and response to many of these issues - they can be ignored at the industry's peril.

2. Does the industry have a response to the environmental effects of fishing?

The effects of fishing on the environment can be divided into trawling and non-trawling sectors. In both trawling and non-trawling sectors bycatch and damage to the seabed tend to receive the greatest publicity. The implementation of devices that reduce bycatch and environmental damage in Australian fisheries is a central issue in the management of the marine environment. Research is required in these areas.

Results from Australian research have recently been published (Mounsey et al, 1995; Robins-Troeger et al., 1995) suggesting that with AusTED fewer larger rays and turtles are caught (Mounsey et al., 1995). Out of this preliminary Australian work it is also reported that prawn catch rates are not significantly lower (Robins-Troeger et al., 1995). However early research in the US by scientists indicated similar results which were subsequently overturned when industry commenced using the proposed equipment. The experience and implementation of BRDs in US fisheries can be seen in Durrenger (1990), Dyer and Moberg (1992), and Moberg and Dyer, (1993).

One of the key issues for industry is the economic effects of these bycatch reduction devices. The effects of BRDs on industry costs has been examined by Hendrickson and Griffin (1993) in the US Gulf of Mexico fishery. The implementation of BRDs raise the cost of taking catch. Crowley, (1994) reports 7%-10% shrimp loss in catches due to the use of TEDs. The fishers see BRDs as reducing catch rates and while this may have long term benefits, the economic appraisal of introducing BRDs show negative net present values from these policies (Hendrickson and Griffin, 1993). It is not clear if there is any market advantage in marketing BRD caught prawn that would offset the higher cost of production. An important result from Hendrickson and Griffin is that BRDs were found to be more effective at reducing bycatch and less costly to shrimpers than area closure policies. Closure policies were generally twice as costly for the fishing industry than policies which had BRDs installed (Hendrickson and Griffin, 1993).

Is there environmentally friendly fishing?

Research is also currently being undertaken in a FRDC funded project involving the Australian Maritime College (AMC), Commonwealth Scientific and Industrial Research Organisation (CSIRO), and Northern Territory Fisheries (NT), on the environmental effects of fishing. One aspect of the project has been the design of a suitable BRD for the Northern Prawn Fishery (NPF). The NPF is ranked as having the third highest ratio of bycatch in the world, as 11.1 kg of bycatch is caught for each kilogram of target prawn taken (Warren, 1994c).

The project has compared nine BRD trawling devices of which two showed significant promise in reducing bycatch (Brewer and Rawlinson, 1995). Rawlinson and Brewer (1995) also surveyed operators in regard to perceived views on bycatch. The operators emphasised that many bycatch species were only found in specific areas. This indicates the need for industry to be involved in solving the problem.

Other research points to alterations of fishing practices that can reduce incidental catch. The operation of the semi-pelagic trawl off the seabed has been found to reduce bycatch significantly without serious reductions in target species catch rates (Brewer and Eayres, 1994, Brewer et al. in press). More research is required to find such outcomes in other fisheries.

US industry response to the bycatch issue

The US experience has led to several strategic responses to the bycatch problem being proposed. Warren (1994f) notes seven winning bycatch strategies.

Seven winning bycatch strategies-National Fisherman (adapted from Warren, 1994f)

- 1. Limit bycatch:** put a quota on the bycatch species. This has been the major tool in the dolphin/tuna interactions in the eastern tropical Pacific (Warren, 1994 e). This enables the industry to give improved statistics on reduced mortalities but leads to 100 % observer coverage with associated costs.
- 2. Reward good guys:** it is suggested a portion of quota is set aside for those vessels which exhibit lowest bycatch rates.
- 3. Divvy up the catch:** a quota may reduce the bycatch of all non-target species.
- 4. Tinker with gear or fishing strategies:** some of the best technical solutions come from fishermen and their improvisations.
- 5. Tweak regulations:** often the bycatch is related to old rules which lead to good fish being thrown overboard or going into areas where substantial bycatch is inevitable.

6. Pass a law: fishers have often needed laws to enable the problems caused by rogue skippers and jurisdictional leaks that are common in fisheries management arrangements.

7. Call an expert: expert help can assist in reducing bycatch problems. Often this can lead to cleaner operational practices as in the case of TEDs sifting catch.

The US industry have come to several other realisations.

" To survive these onslaughts, fishermen must demonstrate that hauling food out of the sea can be- and will remain - a clean , sustainable living." (Warren, 1994g).

*"Every strategy for dealing with bycatch relies on fishermen to change the way they work. Those who have taken up this challenge pursue three pathways: **Research, policy reform and political bridge-building.**" (Warren, 1994g).*

Research involves joint work between fishers and gear technologists/scientists. This is currently happening in Australia (Mounsey et al, 1995: Robins-Troeger et al., 1995; and the AMC/CSIRO/NT-FRDC environmental effects of fishing project). **Policy reforms** are seeking to make individual boats responsible for the minimisation and return of bycatch species. The **bridge-building** is meeting with and making friends with traditional adversaries (green groups and sports fishers).

The US experience also shows that in the face of legislation being imposed and pressure from green lobby groups for cleaner fishing, the industry must forge an industry consensus on how to deal with bycatch. This is lacking in Australia. The US motto has been *"divided we fall"*.

The fishing industry should identify the fisheries which are most at risk from bycatch issues and plan to address these problems. This should have a base line evaluation of the bycatch problem and enable future gains by industry to be measured for evidence of improvement in bycatch. This is important strategic information for industry as it shows how industry have addressed the issue.

The US experience also suggests that industry would be better off going towards regulations they can develop themselves rather than have less appropriate solutions forced on them if a trade embargo is imposed.

Action:

a) The fishing industry should consider the development of *a five year national industry strategy to address the environmental effects of fishing*. This would need to identify the fisheries which are most at risk from bycatch issues

b) For specific fisheries the fishing industry should develop *a response strategy to environmental effects of fishing issues*. An essential element is a program to develop TED's/BRD's suited to Australian conditions, for example estuarine fisheries. Current FRDC initiatives are the obvious framework for this, though *substantial industry cooperation is required*. A central issue in the research is a *nationally consistent testing protocol for bycatch reduction devices*. The US experience shows the need to have comparisons of gears done under standardised conditions. The standards chosen should be appropriate to the industry.

c) The industry requires *further research and development of non-trawling technological devices* to address problems with fishing gears. These would minimise and potentially exclude the capture of incidental species; for example Albatross in the Southern Ocean tuna fisheries.

3. Is the Industry Fishing Responsibly?

The industry must realise that the response of the global fishing industry to international environmental instruments has been the development of the FAO Code of Conduct for Responsible Fishing. Responsible fishing is more than just fishing with a BRD or TED. The code includes sections on (a) fisheries management; (b) fisheries operations; (c) post harvest practices and trade; (d) aquaculture development; (e) integrated coastal area management and (f) fisheries research as previously outlined. The draft Code of Conduct for Responsible Fishing may be a defence under an embargo as reasonable time must be given to industry to conform with any trade sanctions. However this is only in draft form and the code is not going to be a binding instrument.

The code also indicates the need for responsible aquaculture. This attempts to address some of the miscellaneous environmental and sanitary and phyto-sanitary issues in aquaculture. The aquaculture industry should move towards generating a code for responsible aquaculture.

Action:

(a) The industry should investigate the adoption of the draft FAO Code of Conduct in Responsible Fishing by the Australian Fishing industry or *develop a Australian Code for Responsible Fishing (ACREF)*. This could be a distillation of the FAO initiative that is more appropriate to the Australian fishery scene.

(b) The aquaculture industry should move towards developing a code of conduct for aquaculture in Australia. This would primarily address policy and SPS issues.

4. What do fisheries access rights mean in the face of environmentally based closures?

Aligned to the responsible fishing debate are the issues of vessels access and qualities of fishery property right. The industry should try and move towards obtaining fuller more distinct property rights in the face of potential exclusions and limitations on access. This gives some control to the fishers to reduce environmental damage and to manage their fishing in disputed areas. Should moratoria be considered, access rights may require compensation. Poor quality access rights may not lead to an obligation to compensate displaced fishers. This should be of concern to industry.

To date the enhancement of property right characteristics in fisheries management through licensing and more advanced Individual Transferable Quota regimes has aimed to generate economic efficiency through restructuring. However it may be that enhancing "ownership" among fishers may also lead to better environmental outcomes.

The NGO literature has a variety of views on property rights in fisheries management. Greenpeace International resist greater "ownership", though this is expressed in the context of their experiences with the subsidised fleets fishing the high seas boxes in the North Pacific, which is vastly different from the Australian scene. NGOs in Australia, such as regional groups in NSW, recognise the benefits of quantitative restrictions in controlling over-exploitation of fish stocks.

Unfortunately many fisheries biologists and resource managers in conservation agencies see the total cessation of fishing activity as their preferred instrument for zonal management. This is preservation, rather than conservative exploitation and such moratoria are often irreversible. There are some good biological reasons for having closures if they are located in the right place. How is this to be determined? Why does the selection of closed areas often appear to be politically motivated?

Action:

(a) The fishing industry should promote Responsible Fishing as an alternative to complete moratoria.

(b) The fishing industry must realise that a blanket opposition to all area closures is neither publicly or politically sustainable. The industry should be active in developing guidelines for area closures and the education of fishers.

(c) Industry should promote the term "marine reserves" to refer to areas of specified use rather than complete prohibition of activity. Limited use for some responsible fishers is better than no use at all.

(d) Industry and government need to determine the property rights conferred in a fishing licence so as compensation may be available if vessels are removed from prime fishing areas. Could this be addressed as part of a National Fisheries Adjustment Program ? (SCFA, 1995).

5. Can industry benefit from environmental integrity?

The achievement of sustainable fisheries and environmental integrity is clearly in the long term interests of the industry. However there may be shorter term benefits arising from the image of a clean green marine environment.

Out of the bio-diversity concepts there is an increasing realisation that fishing production processes are conducted within many differing marine environments. Management plans will increasingly need to incorporate indices of environmental integrity and these may also be an index of the environmental performance of industry. Already minimisation of bycatch, species preservation, habitat diversity are being used as performance indicators for industry's interface with the environment. This is opening the area of eco-auditing (or eco-accreditation). It is probable that these indicators will be difficult to estimate. This could be a costly process for all parties. The concept has recently been used in the State of the Marine Environment Report (SOMER, 1995) in which the marine environment was given a grading (A, B C etc) as in a school report, but on a rather more subjective basis.

Should the environmental performance of Australian industry be good the adoption of Eco-labelling may be a way to assure customers of the environmentally safe production of fishery products. Eco-labelling may be applicable to the domestic fishing industry and to the seafood industry importing seafood from abroad.

The introduction of "dolphin friendly" labelling on canned tuna has been examined by Wallstrom and Wessels (1994). In the case of chemical residues which affect human health, such as Alar, publicity led to a reduction in the demand for apples (Van Ravenswaay and Hoehn, 1990). However in the case of dolphin friendly the effect of publicity was difficult to measure. It is believed that video footage of the dolphin kills had a negative affect on demand, though other variables indicated the more general publicity on the "tuna disputes" the greater the demand for canned tuna (Wallstrom and Wessels, 1994). However over time the effect of general publicity was believed to be cumulative and negative on consumption. It is suggested that the mixed results indicate that the dolphin issues is not perceived as a quality issue to consumers in the same way as chemical residues in food. These are preliminary results which may apply to the US market only.

The green groups have asked if eco-labels, such as "dolphin friendly" are meaningful? This comes from the belief that the enforcement of the labelling is poor and thus many products end up

with the label irrespective of the source of product. This argument is similar to the "Made in Australia" debate though other labelling of meat products for cholesterol by the National Heart Foundation seem to have integrity.

It is also apparent from US literature that the next eco-marketing concept will be "turtle safe" shrimp (D.K., 1994). Are our prawns "turtle safe"? Who decides? We should move to address these questions given the dependence of our fishing industry on US shrimp markets. If our prawns are turtle safe we should be publicising this fact.

The Australian fish catch is limited and adding value to achieve a greater price per unit for all species is to be encouraged. Marketing our green image can add value to the fish catch, but it is assumed that fisheries are being managed in a sustainable fashion.

Action:

(a) The industry should consider investigating the adoption of eco-accreditation or eco-auditing of fisheries as part of fisheries management plans. Currently it is not clear what these concepts mean in practice for fisheries management. More information is required on the costs of these policies. There may be benefits in terms of market advantage in having such systems in place.

(b) Industry should consider *investigating the adoption of a national fishing/seafood industry guidelines to eco-labelling of fishery products*. This should pay attention to international developments in this area and try to gain the benefits of any increased willingness to pay for seafood amongst consumers. Compliance will also be a problem in the seafood trade arena should eco-labelling be introduced. Who will control eco-labelling of seafood products?

(c) Innovative marketing of marginal species should be encouraged and the fishing industry should investigate the markets for highest quality seafood products caught under good environmental practices. The industry should consider *moving towards eco-labelling of product* and try to obtain the advantage of any price advantage of marketing "green" products internationally (see the APPA, Australian Prawn Promotion Association scheme and the National Fishing Industry Strategy). In the next year the new environmental standard called ISO 14 001 will be introduced with implications for the food and beverage sectors (Anon., 1995)

6. Can the industry control the Cowboys?

From the US scene it is apparent that there will be members of industry who will not be prepared to fish responsibly; for example the US National Marine Fisheries Service calculate that after almost ten years of TED Codes of Practice and legislation being in force there are still 4% of shrimpers in violation of good TED practices (D. K., 1994).

In the US case the leadership of the fishing industry loses credibility with turtle strandings on the opening of the shrimping season. These operators give the industry a bad name and give the green movement legitimate grievance which they use for publicity and fundraising purposes. In response to the strandings green groups in the US offer a \$1000 bounty payment to obtain evidence leading to the arrest and conviction of fishers who violate the Endangered Species status of the Ridley turtle. National Marine Fisheries Service (NMFS) also offer \$10,000 reward for members of industry in violation of the TED regulations. The Australian industry should try and avoid these scenarios.

Action:

The Australian industry should consider having a strategy to identify, control and preferably educate non-complying members. This may involve adhering to an Australian Fishing Industry

Code of Conduct with listing provisions for non-complying members? Non-adherence of some producers to good industry practices could lead to isolation by US domestic legislation and possible embargo. The attitudes and practices of a few offending industry members will be publicised as being "typical" and detract from costly publicity initiatives taken by the fishing industry.

7. Education within the industry.

Education of the Australian fisher and the fishing industry to the threats that are facing the industry internationally is essential. A "paternalistic" or "glossy" approach may not be effective within the industry. The generation of a responsible fishing mind set and image is essential. Opportunities for the industry from having clean seas and fisheries products must be a significant asset to the industry and give considerable comparative advantage in the long term.

The industry must strive to maintain the integrity of the marine environment and pursue strategies to get land based users to reduce pollution, land run off and chemical residues particularly in bays, estuaries and the inshore areas where a significant part of Australian fishing activity is based. Ocean Watch, NSW is a significant move in the right direction.

Action:

Education within the industry could consider the following:

- a) The industry should develop materials on Australia's clean fishing environment and emphasise the opportunities for the domestic fishing industry in keeping the marine environment clean and our fishing responsible.
- b) Industry bodies like Ocean Watch should be developed by industry in other states in order to promote greater environmental integrity and as a line of defence in environmental debates.
- c) Given the increasing international scope of these issues and the isolation of the Australian industry from US markets and industry it is sensible to develop more communication and strategic alliances with the more highly researched US fishing industry. This could involve exchange of information and industry representatives to develop industry policy.
- d) Keep informing industry representatives of environmental issues through short course training initiatives and through fishing magazines.

8. Does the industry have the resources and infrastructure to address environmental obligations?

The history of fisheries management has led to the fishing industry being subject to regulation by government. Only recently has the government recognised the role of the fishing industry in achieving management objectives, though this recognition is not fully reflected in current fisheries legislation. The increasing role of industry in management has led to the industry contributing to the costs of management and research. The industry is under represented at the national level with the ASIC having a limited budget. It is unlikely that industry can provide the entire resources required to cope with the increasing demands on it from international environmental instruments. All of these demands arise out of Australia's participation in the international forum. The responsibilities must be seen first and foremost as a national obligation which must be discharged by the fishing industry with the support of the government. Under current funding arrangements for national fishing industry representative bodies, it is unlikely that the industry alone can meet these national obligations.

Action:

(a) The funding of the adjustments required to comply with international environmental instruments requires both the attention of industry and government. It is clearly in the interest of both parties to ensure that resources are provided to achieve the objectives of the international environmental instruments.

(b) The historical approach to inducing change in industry has been through employment of officials in regulating departments to induce industry compliance. Notwithstanding this, the effective compliance with international environmental instruments under discussion will require an industry oriented approach, particularly through extension, education and applied research.

(c) Increasingly the industry will be expected to pay for some or all of the costs involved in compliance with international environmental requirements. The industry must examine this debate.

External issues for the fishing industry.

1. Who speaks for Australia's fisheries and marine environment?

Currently there are a significant number of arms of government involved in the generation of environmental policies and negotiations of international environmental instruments. The approach is marked by poor communication and coordination between agencies and with the fishing industry. This needs to change. The impression is that environmentally sustainable outcomes can be achieved without real communication with the fishing industry. It is probable that the present structure inhibits the processes whereby environmentally sustainable outcomes will be obtained. Similarly the Australian national good has to be considered by each arm of government and the current situation is inadequate in this respect.

Action:

There is a need to address the communication problems through a more transparent consultative process. The fishing industry would need to take a more active role in the negotiation and implementation of these instruments. Potentially, agencies such as ANCA, DPIE(F), DFAT, ASIC[NFIC], AFMA, NEPA[CEPA] which represent Australia at different international fora need more timely communication with the fishing industry.

2. Liaison with Non-Governmental Organisations (NGOs).

Non Governmental Organisations (NGOs) are usually independent organisations that are either: established by the fishing industry for promoting administration or environmental awareness; environmentally conscious groups focusing on local and regional issues; and finally environmentally conscious groups that are more nationally focused and are aligned to international bodies.

The fisheries policies of NGOs have recently been reviewed by Sturmman (1994) and a brief summary is attached in Appendix Table 4. The review shows how the fishing industry NGO's (No's 1-4) have fewer environmental policies than internationally backed organisations such as Greenpeace (No's 9-14). To date these international groups tend to set the agenda on green issues. The small independent regional organisations tend to focus on local concerns (No's 5-8).

Articles such as Kronman (1994) seek to expose green NGOs for inaccuracies in data reporting and distortion of facts in the name of fundraising. He quotes Gudmundsson who refers to green organisations as *"urban missionaries of a new-age religion, whose pulpits are the media and political forums - venues where fishermen are either unskilled or have little time to dabble"*

Kronman (1994). This is dangerous ground for fishers, who by their own admission, have little advantage in the NGO political arena.

The points raised by this quote also illustrate the changing nature of the environmental movement. The political and legal emphasis is now moving towards a morality based argument (Kent, 1994). However past NGO policies are now being adopted as subordinate standards by many fisheries agencies (Kelley, 1994), for example the precautionary principle - food for thought?

Action:

(a) The fishing industry needs representation on NGO and green fora so as to actively participate in the process of increasing environmental awareness and responsibility within the fishing industry.

(b) The industry needs to avoid unjustified attacks on the NGOs in fishing magazines and in the press. These are often counter-productive with little benefit to industry.

(c) The industry should recognise that some of the environmental issues raised by NGOs are in the long-term interests of the industry, for example habitat protection and reduction of land run off and marine pollution.

3. Local Authority initiatives.

The fishing industry should seek to inform local authorities of their role and responsibilities for the care, maintenance and prosperity of coastal habitats. The fishing industry is an inshore activity that depends on sound agricultural, industrial, and water catchment management processes.

Action:

Local Authorities in Australia should be encouraged to adopt a *National Code of Conduct for Local Authorities*. This should advise them on their responsibility to protect coastal habitat for fishery and environmental reasons. (See the Lisbon Declaration- Advisory Committee on the Protection of the Sea, ACOPS, 1994). This strategy is consistent with our international obligations and the principles of Environmentally Sustainable Development.

4. Publicity, promotion and education.

The Australian fishing and seafood industry should sell its clean environment and compliance with international standards in fisheries management overseas. This should also concentrate on enhancing public perceptions of the fishing industry is responsible approach to harvesting and management. The most successful promotional material is probably not the national glossy material representing the national industry, but regional material which concentrates more on local issues and which is less corporate. The success of the clean up Australia campaign is worth examining as a method to promote awareness of the coastal zone and the implications of local government policy on fisheries within Australia.

Action:

The fishing and seafood industries should examine the production of suitable publicity, promotional and educational material.

Tsamenyi and McIlgorm (FRDC), International environmental instruments and the fishing industry - Final Report.

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Appendix Table 1: An opportunity threats analysis by Industry sector.

INDUSTRY SECTOR	THREATS	OPPORTUNITIES
<i>Catching Sector</i>		
Large vessels	Endangered Species / CITES/Precautionary principle SS/HMS bycatch/trade sanctions Code of Conduct for responsible fishing ? World Heritage, Biodiversity Convention Bonn Convention/ CCAMLR south of 60° South	Comply with US TEDs standards for US markets Code of conduct for responsible fishing ?
Small vessels	Endangered species / CITES/Precautionary principle By catch/ trade sanctions World Heritage/ Biodiversity Convention	RAMSAR (protecting habitat)
Vessels below 10 meters	Precautionary principle, by catch/ trade sanctions World Heritage/ Biodiversity Convention	RAMSAR (protecting habitat)
<i>Markets/ Exporters</i>	International trade agreements U.S legislation, tariffs, NTBs and embargoes SPS (sanitary and phyto-sanitary measures) Food and chemical residues	Complying with international environmental initiatives? Eco-labelling of products?
<i>Processors/Importers</i>	SPS, food and chemical residues Price rises of imported white fish if other nations adopt measures TEDS/higher standards?	Increasing the quality of imported fish ?

Appendix Table 2: An opportunity threats analysis by area and fishing method.

AREAS	THREATS	OPPORTUNITIES
<i>High seas</i>	High seas /HMS/Straddling stocks Code of conduct for responsible fishing CITES (SBT, Billfish species? and Orange Roughy) Unilateral declarations by other countries	
<i>in AEEZ/AFZ</i>	CITES (SBT, Billfish?, Gemfish and Orange Roughy) LOSC, Agenda 21, SS/HMS, Precautionary principle	
<i>Inshore Shelf</i>	Agenda 21, LOSC RAMSAR ? (<6 m deep), Biodiversity Convention Precautionary principle / bycatch issues	Get Australian environmental agreement on coastal pollution, land run off etc Lisbon Declaration equivalent
<i>Estuarine</i>	Agenda 21, World Heritage. RAMSAR? (<6 m deep), Biodiversity Convention Precautionary principle / bycatch issues	Get Australian environmental agreement on coastal pollution, land run off etc Lisbon declaration equivalent
FISHING METHOD	THREATS	OPPORTUNITIES
<i>Trawling Demersal</i>	Agenda 21, "Minimise bycatch" Bycatch eg. Northern Prawn other estuarine shrimp fisheries	Gear modification to reduce sea floor contact
<i>Pelagic</i>	Bycatch	Pelagic / semi-pelagic fishing methods may expand due to reduced sea floor contact.
<i>Purse seining</i>	Agenda 21, "Minimise bycatch" Bycatch ie on associated species eg. baitfish	Adopt industry code of practice for multispecies fisheries management
<i>Longlining</i>	Endangered species legislation (Albatross) Bonn Convention for migratory animals Agenda 21, "Minimise bycatch"	

Appendix Table 3: An opportunity threats analysis by species group.

SPECIES GROUP	THREATS	OPPORTUNITIES
<i>Crustaceans</i>		
Prawns	Bycatch/ fishing method/ Agenda 21/ Code of Conduct Live fish transport and Sanitary and Phyto-Sanitary measures. Trade embargoes from United States (TEDS/BRDs)	Market advantage from complying to environmental regulations eg US TED/BRD regulations.
Rock Lobsters	Live fish transport and Sanitary and Phyto-Sanitary measures.	
<i>Molluscs</i>		
Abalone	Live fish transport and Sanitary and Phyto-Sanitary measures.	
Mussels /oysters	Sanitary and Phyto-Sanitary measures.	
<i>Fish (trawled)</i>		
	Agenda 21, Bycatch Endangering species/ threatening process? Orange roughy , Gemfish and the precautionary principle	
<i>Sharks</i>		
	School shark and Precautionary principle?/ CITES Endangered Species/Biodiversity Convention	
<i>Tunas/pelagics</i>		
	Strad. Stocks/ HMS, Precautionary principle. Bonn Convention for migratory animals Endangered species (fish and birds)/ bycatch	
<i>Clupeids/Sardinella</i>		
	Precautionary principle /HMS associated species (pilchards)	
All Species	Live fish transport and Sanitary and Phyto-Sanitary measures. eg use of comatose chemicals Code of Conduct (restrictions on fish /additives/ adulteration)	Higher prices from live fish transport benefits from conforming to environmental instruments.

Appendix Table 4: Australian NGOs and fisheries management policies (adapted from Sturmann, 1994).

	NON GOVERNMENTAL ORGANISATIONS NGOs	TYPE OF NGO	SUSTAIN- ABILITY OF FISHING INDUSTRY	Principle areas for NGO Policy					
				POLLUTION INTRODUCED ORGANISMS	HABITAT LOSS	BIO- DIVERSITY	OVER- FISHING	BYCATCH/ ENDANGERED WILDLIFE	ILLEGAL TRADE
1	SAFIC	State Fisheries	X						
2	OCEANWATCH	"	X	X	X				
3	QCFO	"	X	X	X			X	
4	ASIC (NFIC)	National Fisheries	X	X	X		X		
5	EC NT	Regional	X	X	X			X	
6	TCT	"	X	X	X	X			
7	NCC of NSW	"	X	X	X	X	X		
8	VNPA	"	X	X	X	X			
9	ACF	National	X	X	X	X	X	X	
10	TRAFFIC	International	X					X	X
11	WWF	International	X					X	X
12	GP AUSTRALIA	Nat./International	X	X	X	X	X	X	X
13	GP NEW ZEALAND	" "	X	X	X	X	X	X	
14	ACIUCN	" "	X	X	X	X	X		

Key: ACF (Australian Conservation Foundation), ACIUCN (Australian Committee for the International Union for the Conservation of Nature, ASIC (Australian Seafood Industry Council), EC NT (The Environmental Centre of the Northern Territory), GP (Green Peace), NCC of NSW (Nature Conservation Council of New South Wales), NFIC (National Fishing Industry Council), QCFO (Queensland Commercial Fisherman's Organisation), SAFIC (South Australian Fishing Industry Council), (Tasmania Conservation Trust), TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce), VNPA (Victorian National Parks Association), WWF (World Wildlife Fund).