Asia-Pacific
Economic Cooperation

Assessment of Impacts of Illegal, Unreported and Unregulated (IUU) Fishing in the Asia-Pacific

Asia-Pacific Economic Cooperation
Fisheries Working Group

November 2008

Asia-Pacific
Economic Cooperation

Assessment of Impacts of Illegal, Unreported and Unregulated (IUU) Fishing in the Asia-Pacific

Asia-Pacific Economic Cooperation
Fisheries Working Group

November 2008

Frank Meere and Mary Lack
Sustainable Fisheries Management

Prepared by

Sustainable Fisheries Management
58 Fidge Street
Calwell ACT Australia 2905
Tel: (61) 2 6291 7690
Fax: (61) 2 6291 7690
Email: fmeere@aapt.net.au

FOR THE ASIA-PACIFIC ECONOMIC COOPERATION SECRETARIAT
35 Heng Mui Keng Terrace Singapore 119616
Tel: (65) 6891-9600 Fax: (65) 6891-9690
Email: info@apec.org
Website: www.apec.org

Title: Assessment of Impacts of Illegal, Unreported and Unregulated (IUU) Fishing in the Asia-Pacific

ISBN: 978-981-08-1995-8
APEC#208-FS-01.5

EXECUTIVE SUMMARY

The Pacific Ocean is a source of more than 60% of global marine capture production (Food and Agriculture Organization of the United Nations, 2008a) and fishing makes a significant economic and social contribution to many economies in the Asia-Pacific region. However, the status of a number of economically important fish stocks in the Pacific Ocean is of concern. Overfishing has caused significant declines of some stocks in waters under national jurisdiction and of some migratory and straddling stocks. Illegal, unreported and unregulated (IUU) fishing is one of a range of interrelated factors that is putting these stocks at risk. It is estimated that 3.4 – 8.1 million t of fish is taken by IUU fishing each year in the Asia-Pacific region (Marine Resources Assessment Group and University of British Columbia, 2008). This represents between 8 and 16% of the reported 51 million t of catch from the Pacific Ocean in recent years.

There is, therefore, both a regional and global imperative to address IUU fishing in the Asia-Pacific region. APEC Ministers recognised this need through elements of the 2005 Bali Plan of Action and through their 2006 direction to the APEC Fisheries Working Group to develop programs: to assess the impacts of IUU fishing; to enforce management measures; and to reduce excess fishing capacity. This report responds to that direction by reviewing the impacts of IUU fishing with reference to published literature, responses to questionnaires and four case studies. The report aims to provide APEC economies with a better understanding of the scope of the IUU fishing problem in the region and to provide a basis for action to minimize IUU fishing and mitigate its impacts. The analysis has focused on IUU fishing by foreign vessels within exclusive economic zones (EEZs) and IUU fishing on the high seas.

The economies of the Asia-Pacific region vary widely in terms of their economic development and diversity, in their reliance on fisheries catch and processing, and their human and financial capacity to address IUU fishing. The drivers of IUU fishing, the species affected, its economic, social and environmental impacts and the level and effectiveness of responses to IUU fishing also vary. Across the Asia-Pacific region IUU fishing includes:

- IUU activities by small scale, artisanal vessels in their own waters, and in some circumstances in the EEZs of other States, driven by the need to meet basic human needs,
- incidental IUU activities by otherwise legitimate commercial fishers seeking to increase profits;
- systemic IUU activity, occurring under the cover of legal industrial fishing operations, seeking to minimise access fees and maximise profits; and
- industrial fishing operations which make no attempt to legitimise their enterprise and deliberately set out to conduct IUU fishing, seeking to maximise returns and to minimise costs.

The study's findings about the nature and extent of IUU fishing are summarised below according to five broad categories.

Uncertainty and data gaps

1. There remain high levels of uncertainty about the quantity and value of IUU fishing in the region and the true extent of economic, social and environmental impacts are therefore also uncertain.

2. Gaps in the data relate to:

i. the species affected;
ii. the quantity of species, or even groups of species, taken by IUU fishing;
iii. the value of the IUU catch;
iv. the total economic losses associated with that catch in terms of the income foregone from catch, processing and trade in the short term and reduced fishing, processing and tourism opportunities due to overfishing and or degradation of marine ecosystems in the longer term; and
v. the impacts on food security.

3. The lack of data, and the consequent uncertainty about the nature, extent and impact of IUU fishing in the region have consequences for:
   i. the capacity to inform policy makers of the extent and complex nature of the IUU fishing problem and the need for integrated solutions;
   ii. gaining political commitment and the financial resources to address IUU fishing;
   iii. the effective targeting of the available financial and human resources;
   iv. ensuring adequate judicial responses to IUU fishing;,
   v. the application of suitably precautionary fisheries management; and
   vi. for the monitoring of effectiveness of measures implemented to address IUU fishing.

Significance of the problem

4. Despite the lack of detailed information, this assessment indicates that IUU fishing is a significant problem in the Asia-Pacific region.

5. While there are signs that dedicated initiatives have addressed some specific IUU fishing problems in the region, there is no indication that IUU fishing across the region as a whole is declining. Rather, there are grounds to believe that the problem is likely to increase in the absence of significant intervention.

Diverse range of drivers

6. The main drivers for IUU fishing in the region are:
   i. the lack of domestic management of marine resources and fishing capacity and consequent overfishing of those resources in many economies;
   ii. a lack of capacity to enforce fisheries management measures and protect borders;
   iii. failure to control the operations of vessels operating outside their EEZs;
   iv. a lack of alternative employment opportunities for those displaced from fishing;
   v. undelimited or disputed boundaries; and
   vi. generally buoyant market conditions for seafood products.

Governance failures

7. The first five of the above drivers are symptomatic of broader systemic failures in governance in some economies and at the regional level, and the generally challenging economic and social circumstances faced by many economies in the Asia-Pacific region. These factors are characterised by:
   i. a lack of political will domestically, and in regional management fora, to implement, rather than merely articulate, the actions required to address IUU fishing;

ii. a low level of participation in relevant binding international agreements reflecting a lack of commitment to current global views and expectations on effective fisheries management and enforcement;
iii. the absence of effective domestic fisheries legislation and research needed to provide a platform for the introduction of domestic fisheries management measures and control of flag State vessels wherever they operate;
iv. the failure to enforce fisheries management measures due to low levels of financial resourcing, lack of capacity to detect and prosecute infringements, corruption and/or political influence in the judicial system;
v. delays in the development and implementation of binding regional measures to address IUU fishing; and
vi. a lack of integrated policies to address the management of fisheries and the provision of alternative livelihoods for those displaced from fishing.

Need for an holistic and integrated approach

8. There is a need for an holistic and integrated approach to dealing with IUU fishing. This will require:
   i. recognition of the impacts of IUU fishing at the political level and commitment to minimising those impacts, acknowledging that this will require both short and long-term actions;
   ii. implementation of measures to minimise existing IUU fishing in parallel with improving domestic capacity to manage fisheries, enforce management measures, protect borders and control the operations of vessels fishing outside their EEZs;
   iii. commitment of resources necessary to address the drivers of IUU fishing;
   iv. cooperation between flag, port and market States;
   v. the use of catch and market-based measures;
   vi. participation in relevant international agreements and organisations and implementation of the obligations that this involves; and
   vii. adoption of bilateral, regional and multilateral arrangements, as appropriate, to deal with specific IUU fishing issues.

The conclusions above highlight that there is no simple, single or short term solution to IUU fishing in the Asia-Pacific region. IUU fishing is not just an issue for the fisheries sector. Successful responses will require holistic and integrated policies linked to the drivers for IUU fishing. Success will require independent action by States, bilateral action particularly by adjacent States, and multilateral action, through, but not restricted to, regional fisheries management organisations (RFMOs). It will involve greater commitment to, and implementation of, internationally recognised benchmarks for fisheries management and monitoring, control and surveillance (MCS). The following recommendations reflect these findings. Those that have broad application across the Asia-Pacific region are presented under three main headings: data gaps; fisheries management and broader governance; and holistic and integrated policies. Specific recommendations are then made for four subregions.

Data and data gaps

1. using available MCS information on sightings and apprehensions, economies establish programs to collate information and develop estimates of the level of IUU fishing and the species taken in their waters;

2. periodically, economies use the estimates of IUU fishing as the basis for research into the direct and indirect economic, social and environmental impacts of IUU fishing;

3. economies that are members of RFMOs in the region should seek that those RFMOs develop and adopt methods to estimate the level of IUU fishing for key target species;

Fisheries management and broader governance

4. economies develop and implement appropriate legislation (including penalties commensurate with the impact of IUU fishing) to enable the development of formal management regimes that provide a framework for defining fisheries, limiting access to those fisheries and establishing MCS arrangements to safeguard those arrangements;

5. reflecting the commitments made by APEC economies under the Bali Plan of Action, economies progress, as a priority, fisheries management reform including:

    i. ensuring capacity does not exceed long-term resource sustainability,
    ii. enhancing MCS programs,
    iii. establishing adequate sanctions to achieve deterrence, and
    iv. adopting of ecosystem and precautionary approaches;

6. where breaches of fisheries legislation occur they are pursued to the full extent of the law;

7. economies, independently and with the assistance of donor agencies, identify and address institutional weaknesses, including a lack of professionalism and ethical conduct, which undermine the effectiveness of sound fisheries management and legislation and allow for corruption in decision making;

8. economies ensure that there is formal control and monitoring of the operations of all vessels flying their flag outside their EEZ by reviewing their current flag State arrangements to meet contemporary international obligations, including those under the United Nations Fish Stocks Agreement (UNFSA) and the Compliance Agreement;

9. reflecting the commitments made by APEC economies under the Bali Plan of Action, those economies that have not ratified the United National Convention on the Law of the Sea orthe UNFSA or accepted the Compliance Agreement, do so and implement their provisions through domestic legislation as a matter of urgency;

10. where appropriate, economies participate actively in relevant RFMOs, support the adoption of best practice measures to address IUU fishing and seek consistency in approaches to IUU fishing across RFMOs in the region;

11. economies engage actively in the development of the binding port State agreement and ratify and implement its requirements as soon as possible;

12. those economies that are important processors and re-exporters of fish products adopt measures to ensure that they do not facilitate trade in IUU-caught fish by immediately implementing the model port State arrangements and, where appropriate, fully implementing the requirements of any product tracking schemes;

Holistic and integrated policies

13. in order to maximise the effectiveness of capacity management schemes, economies ensure that
    i. excess fishing vessels are disposed of to reduce the chance of them engaging in IUU fishing,
    ii. all harmful subsidies to the fishing industry and any production targets are removed,
    iii. where necessary, integrated government policies, to address the issues associated with labour displaced from fishing, are developed to provide long-term alternative employment opportunities, acknowledging that these will not necessarily be marine-based, and to provide appropriate education and training;

14. economies facilitate greater coordination across their government agencies including law, customs, police, defence, foreign affairs and fisheries agencies, to maximise the effectiveness of efforts to address IUU fishing;

15. economies cooperate, to the maximum extent possible, to pursue coordinated action across flag, port and market States to address IUU fishing through controls on both catch and trade of fisheries products;

16. developed economies assess their ability to provide fisheries management expertise and other relevant assistance to economies in the region that may have limited capacity to implement the recommendations of this study and develop a coordinated and strategic approach to provision of this assistance;

North Pacific

17. economies in the subregion should extend cooperation from at-sea detection and deterrence to cooperation between flag, port and market States aimed at minimizing opportunities for IUU product to reach markets;

Southeast Asia

18. improvements to the legal, policy and governance frameworks for fisheries management are required as a priority;

19. fishing capacity must be limited and excess vessels and gear removed;

20. appropriate alternative employment, providing returns commensurate with those available from the fishing industry, and retraining programs must be provided in parallel to attempts to manage fishing capacity;

21. maritime boundaries need to be formalised;

22. review the significant number of fisheries-related organisation in the region, with a view to identifying a single body with the competence and capacity to address IUU fishing by:

    i. providing a forum for exchange of information,
    ii. developing common regional approaches,
    iii. reducing duplication and improving outcomes from international cooperation,
    iv. providing a mechanism to centralise agreed action to combat IUU fishing, and

v. providing regional economies with tangible support to combat IUU fishing;

Western and Central Pacific

23. access agreements with distant water fishing nations should be revised to minimise the incentive for underreporting and, wherever possible, should not be linked to any other development assistance;

24. developed economies must continue to support current MCS initiatives in the subregion in order to ensure their long-term effectiveness, the sustainability of marine resources and the longer-term viability of these economies

South Eastern Pacific

25. economies should, as a matter of priority, seek to finalise negotiation of the South Pacific RFMO convention and implement the agreed interim measures

26. further detailed analysis of IUU fishing in this subregion should be undertaken to define more clearly the nature and extent of the impact of IUU fishing and to identify region-specific responses to the issue.

TABLE OF CONTENTS

1. INTRODUCTION

Illegal, unreported and unregulated (IUU) fishing in the Asia-Pacific region has been the subject of considerable discussion over the last decade. During that period, concern about the economic, social and environmental impacts of IUU fishing in the region, as elsewhere in the world, has increased.

Managing living resources sustainably and providing for sustained economic benefits from oceans are two key components of the Bali Plan of Action (BPA)[1], endorsed by APEC Oceans Ministers in 2005, which have a direct bearing on this study. The BPA made specific commitments to meeting a range of international obligations, improving fisheries and aquaculture management (including improving monitoring, control and surveillance (MCS), managing capacity, bycatch management and conservation of sharks and turtles) and reducing and eliminating corruption that undermines sustainable fisheries management and fair trade in fisheries products.

The BPA sought (among other things) to:

i. engage in fisheries management reform, where appropriate, including through regional fisheries management organisation (RFMO) reform, by advocating the application of an ecosystem approach to fisheries management, improving decision-making processes to reflect a precautionary approach, ensuring capacity does not exceed long-term resource sustainability, enhancing MCS programs, and establishing adequate sanctions to achieve deterrence;

ii. strengthen efforts to combat IUU fishing including by pursuing the use of at-sea, port State and trade-related measures, in accordance with international law, as key compliance tools, through APEC capacity building and sharing of best practices, and strengthen efforts to collaborate through MCS regimes and the MCS Network[2]; and

iii. identify mechanisms to better manage fishing capacity, such as through projects that facilitate the sharing of APEC economy experiences in fishing capacity reduction and adjustment, to help ensure a balance between such capacity and long-term resource sustainability (APEC, 2005).

Subsequently, in 2006, the joint statement of Ministers attending the 18th APEC Ministerial Meeting noted that:

> "illegal fishing undermines free and fair trade in fisheries products"

and directed the APEC Fisheries Working Group (FWG) to:

> "develop programs to assess the impacts of illegal fishing activities, enforce fisheries management measures, and address overcapacity in fishing fleets and report back to Ministers on their progress." (APEC, 2006)

This report responds to that direction by:

[1] The Bali Plan of action can be found at: http://www.apec.org/apec/ministerial_statements/sectoral_ministerial/ocean-related/2005_ocean-related/bali_plan_of_action.html

[2] The MCS Network was established to facilitate the collaboration of MCS professionals worldwide in order to increase and improve MCS efforts in the global fight against IUU fishing.

- reviewing the impacts of IUU fishing in specific fisheries in the Asia-Pacific region, including review of existing/available information;
- identifying data for assessing IUU fishing and identifying the gaps in data and knowledge;
- identifying mechanisms for addressing IUU fishing, including the use of international and regional instruments/agreements and development programs for alternative sources of employment;
- identifying trends, challenges and opportunities in addressing IUU fishing; and
- recommending actions for APEC economies and all other relevant stakeholders in the Asia-Pacific region, including recommendations related to trade, fisheries management and enforcement, employment opportunities, etc.

The overall objective of the study is to provide APEC economies with a better understanding of the scope of the IUU fishing problem in the Asia-Pacific region and to provide a basis for recommendations for minimizing IUU fishing and mitigating the impacts of this activity.

1.1. Report structure

An overview of the methodology adopted to identify information and data is presented in Section 2 of the reported followed, in Section 3, by a review of IUU fishing in the global context. Using all the information available, the nature and level of IUU fishing in the Asia-Pacific region is then analysed, and the main gaps in the data identified, in Section 4. This provides the basis for an examination of the economic, social and environmental impacts of IUU fishing activity which is presented in Section 5. Best practice responses, along with an overview of responses to IUU fishing by APEC economies, is then provided in Section 6. That analysis is used in Section 7 as the basis for conclusions, for the region as a whole and on a subregional basis, about the nature, extent and impact of IUU fishing and the obstacles to addressing it. Finally, in Section 8, recommendations are made to maximise the effectiveness of measures to address IUU fishing.

2. METHODOLOGY

2.1. Sources of information

The analysis contained in this report is based on three main sources of information:

- a review of the literature and publicly available data on the nature and extent of IUU fishing in the Asia-Pacific region;
- responses to questionnaires distributed to APEC member economies and intergovernmental and nongovernmental organisations; and
- four case studies of IUU fishing in the Asia-Pacific region.

Each of these sources is discussed below.

2.1.1. Literature and data review

A review of the literature and accessible sources of data on the nature and extent of IUU fishing in the Asia-Pacific region and its economic, social and environmental impacts in the region was conducted. Relevant literature and data sources were identified through:

- reference to known published works on IUU fishing;
- internet searches for relevant literature;

- collation of relevant media reports over the period November 2006 to June 2008;
- contact with the APEC secretariat and all APEC member economies;
- contact with a range of intergovernmental and nongovernmental organisations; and
- discussions with other researchers working on the issue.

A list of all agencies and individuals contacted throughout the course of this project is contained in Annex 1.

The relevant literature included reports that addressed:

- aspects of IUU fishing globally; and/or
- the nature and/or extent of IUU fishing in the Asia-Pacific region; and/or
- aspects of governance, institutional arrangements, fisheries management or MCS measures that affect the capacity to address IUU fishing in the region.

The sources and bases of the available estimates of IUU fishing, and the credibility attaching to these estimates, vary widely. In addition, many of the IUU fishing estimates do not discriminate between IUU fishing by foreign vessels within waters under national jurisdiction, IUU fishing by domestic vessels within national waters, and IUU fishing on the high seas. This reduces the utility of these estimates for the purposes of characterizing IUU fishing in the region.

While a relatively large number of relevant reports and articles were identified it was apparent that the available analysis of IUU fishing in the Asia-Pacific region was, at best, ad hoc and was variable in the extent to which it covers subregions. There was, for example, a relatively large number of analyses and commentaries on IUU fishing in Southeast Asia but relatively few in relation to the South Eastern Pacific. Although the literature provides some information on the nature (form, species, location) and extent (quantity and value) of IUU fishing it does not, on its own, provide a comprehensive picture of the IUU fishing problem across the region as a whole or enable conclusions to be drawn about the priorities to be addressed or the appropriate policy responses to the issue.

2.1.2. Questionnaire

Three questionnaires were developed with the aim of identifying the most recent and most comprehensive information on IUU fishing in the region. A detailed questionnaire was distributed to FWG members and separate, less detailed, questionnaires were distributed to intergovernmental (including relevant regional fishery bodies) and nongovernmental organisations. Questionnaires were distributed in January 2008 with responses required, initially, by March 2008 but with the deadline subsequently extended to May 2008 in an attempt to maximise the response rate.

The questionnaire to member economies sought information on:

- the nature and extent of IUU fishing both within their jurisdictions and on the high seas and by both domestic and foreign vessels;
- the economic, social and environmental impacts of IUU fishing;
- policy responses to IUU fishing;
- the nature and extent of their regional and international engagement relevant to addressing IUU fishing;
- the economic and social significance of fishing to their economies; and

- the institutional and legal structures in place for fisheries management and MCS.

Questionnaires to intergovernmental and nongovernmental organisations sought information on:

- holdings of data on IUU fishing in the region and the extent to which this information is shared;
- where relevant, the nature and level of MCS measures designed to address IUU fishing and the level of expenditure associated with these;
- studies of the nature, extent and economic, social and environmental impacts of IUU fishing in the region;
- the seriousness with which they view IUU fishing in the region;
- emerging IUU fishing issues; and
- their views on appropriate responses to IUU fishing in the region.

Questionnaire response rates are provided in Table 1 and questionnaire recipients are identified in Annex 1.

Table 1: Response rates to questionnaire

Category	Number distributed	Responses received	Response rate
FWG members	21	10	48%
Intergovernmental organisations	10	8	80%
Nongovernmental organisations	4	2	50%

While the response from member economies was limited, the information provided offered some insights into the nature and extent of the problem and the responses being adopted to deal with it. In combination with the useful information provided by non-governmental and intergovernmental organisations and the literature available, this provided a solid, albeit not comprehensive, foundation for assessment of IUU fishing in the region.

2.1.3. Case studies

Four case studies of IUU fishing in the Asia-Pacific region were conducted to provide fishery-specific information for inclusion in this study. APEC funded two of these case studies which examined:

1. IUU fishing in the Sulawesi Sea (Palma and Tsamenyi, 2008)

   This study analyses the nature and extent of IUU fishing in the Sulawesi Sea, the drivers of this activity and its economic, social and environmental impacts. The analysis highlights the need to strengthen the existing level of cooperation among the littoral States of the Sulawesi Sea even in the absence of agreed maritime boundaries.

2. the impacts of IUU fishing in the east coast of Peninsular Malaysia (Sea Resources Management, 2008)

   The study analyses the forms and drivers of IUU fishing in the east coast of Peninsular Malaysia. It demonstrates, through the use of a Driver-Pressure-State-Impact Response (DPSIR) model, the complexities of the problem, including the subtle influences of local

cultural factors and ethnicity. The study also demonstrates the connectivity between a range of government policies that affect the environment in which IUU fishing occurs.

A further two case studies were sponsored by APEC member economies:

3. A Canadian-funded case study of the economic, social and environmental impacts of the Russian IUU sea urchin fishery (Krause, 2008);

   This study highlights the economic, environmental and political complexities involved in IUU fishing and the need for internationally recognized and applied principles and regulatory policies across all relevant fisheries and associated markets.

4. information provided by Australia and Indonesia on the background to, and initiatives underway under, *The Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (RPOA)* (Australian Department of Agriculture Fisheries and Forestry (DAFF) and the Indonesian Ministry for Marine Affairs and Fisheries (MMAF), 2008).

Three of the four case studies provided data on the nature and extent of IUU fishing in specific cases and, to varying degrees, the economic, social and environmental impacts of this activity. The case studies identified a range of drivers for IUU fishing and highlighted the need for different policy responses suitable for the specific circumstances in which IUU fishing is occurring.

2.2. Definitions

2.2.1. IUU fishing

For the purposes of this report the definition of IUU fishing contained in the *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (the IPOA–IUU Fishing) (Food and Agriculture Organization of the United Nations (FAO), 2001) has been adopted. The IPOA–IUU Fishing definition of the three components of IUU fishing is provided in Box 1. In practice, there is a considerable amount of confusion about the use of the term IUU fishing. Many references to IUU fishing fail to differentiate clearly between the three forms of fishing and the term “illegal fishing” is commonly used, incorrectly, as shorthand for IUU fishing. Further, IUU fishing is often assumed to relate only to illegal fishing by foreign vessels in the exclusive economic zones (EEZ) of another country. This is clearly not the intention of the IPOA-IUU fishing. While every effort has been made in this study to identify the three forms of IUU fishing separately, so that appropriate policy responses can be developed, the information necessary to do so has not always been available.

IUU fishing can occur within EEZs, by either domestic or foreign vessels, and on the high seas. For this project, information on all forms of IUU fishing, by both domestic and foreign vessels within EEZs and on the high seas has been collected and reported. However the analysis and recommendations focus on IUU fishing by foreign vessels within EEZs and IUU fishing on the high seas. It was decided that the IUU fishing issues associated with domestic vessels within EEZs were largely issues for individual economies to deal with and did not, in the main, lend themselves to regional or subregional approaches. In addition, this project is focused on capture production of marine fish and does not consider issues associated with fishing in internal waters or with aquaculture. It is likely, however, that some of the drivers for IUU fishing by foreign vessels and on the high seas will be similar to those that drive IUU fishing by domestic vessels within EEZs and that some of the policy responses to these issues will therefore also be relevant to the efforts of individual economies to address IUU fishing by domestic vessels within their own fisheries.

Box 1 Definition of IUU fishing

Illegal fishing is activity:

- conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
- conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization but operate in contravention of the conservation and management measures adopted by that organization and by which the States are bound, or relevant provisions of the applicable international law; or
- in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization.

Unreported fishing is activity:

- which has not been reported, or has been misreported, to the relevant national authority, in contravention of national laws and regulations; or
- undertaken in the area of competence of a relevant regional fisheries management organization which has not been reported or has been misreported, in contravention of the reporting procedures of that organization.

Unregulated fishing is activity:

- in the area of application of a relevant regional fisheries management organization that is conducted by vessels without nationality, or by those flying the flag of a State not party to that organization, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organization; or
- in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.
- Noting that, certain unregulated fishing may take place in a manner which is not in violation of applicable international law, and may not require the application of measures envisaged under the IPOA.[3]

Source: FAO, 2001.

2.2.2. Asia-Pacific region

This study is concerned with IUU fishing in the Asia-Pacific region as a whole. For the purposes of this study all economies with a coast line abutting the Pacific Ocean, including the 21 member economies of APEC, have been included. Forty-eight relevant economies have been identified and grouped into four subregions (see Table 2, APEC economies bolded). These subregions reflect the nature of regional fisheries groupings and the identified IUU fishing issues in the region. Even within these groupings there is considerable diversity in the biophysical, cultural, economic and political characteristics of economies and this affects their relative vulnerability and capacity to respond to IUU fishing.

[3] This is because some high seas waters and fisheries remain unregulated by RFMOs. Although, it can be argued that current international law effectively means that all areas of the high seas are, or should be, subject to regulation.

Table 2: Economies comprising the Asia-Pacific region[1]

North Pacific	Southeast Asia	Western and Central Pacific	South Eastern Pacific
Canada	**Australia**	Cook Islands	**Chile**
China	**Brunei**	Fiji	Colombia
Hong Kong,	**Darussalam**	French Polynesia	Costa Rica
China	Cambodia	Kiribati	Ecuador
Japan	**Indonesia**	Marshall Islands	El Salvador
Korea	**Malaysia**	Micronesia, Fed. States of	Guatemala
North Korea	**Papua New**	Nauru	Honduras
The Russian	**Guinea**	New Caledonia	**Mexico**
Federation	**The Philippines**	**New Zealand**	Nicaragua
Chinese Taipei	**Singapore**	Niue	Panama
The USA	**Thailand**	Palau	**Peru**
	Timor-Leste	Samoa	
	Viet Nam	Solomon Islands	
		Tonga	
		Tuvalu	
		Vanuatu	
		Wallis and Futuna Islands (France)	

1. Relevant Territories of APEC Member economies are also included.

3. IUU FISHING IN THE GLOBAL CONTEXT

3.1. Nature and extent of IUU fishing globally

A study conducted in 2005[4] (Marine Resources Assessment Group (MRAG), 2005a) put the worldwide value of IUU catches at somewhere between US$4.2b and US$9.5b per year. At the time the study acknowledged that these figures need to be treated with caution, given the nature of IUU activity, but it was considered highly likely that these figures may underestimate the size of the direct economic problem. More recently work by MRAG and the University of British Columbia (UBC) appears to confirm that view, estimating that globally, between 11.06 and 25.91 million tonnes of fish valued at between US$10b and US$23b is taken by illegal or unregulated fishing[5] (MRAG and UBC, 2008).

MRAG (2005a) estimated that approximately US$1.25b of these losses came from the high seas with the balance coming from the EEZs of coastal States. The report highlights the important effect IUU fishing has on developing countries. It estimates that the losses from waters of Sub-Saharan African countries are US$0.94b per year which is almost 20% of the landed (declared) catch for this region. Importantly, it concluded that IUU fishing was having, large economic and downstream social impacts on developing countries. In the Asia-Pacific region the only case study undertaken in the 2005 MRAG study was for Papua New Guinea, where, in 2003-2004 losses were found to approximate US$35m, despite what the report describes as “good” MCS arrangements being in place.

IUU fishing imposes significant economic costs on some of the poorest nations in the world, which depend on fisheries for food, for employment for a significant proportion of the unskilled workforce and, in many cases, for income derived from fees by foreign vessels for access to the fishing zones. The fishing industry in APEC economies presently takes some 75% of the world's total catch and the APEC region consumes 70% of the world's fish

[4] This is probably the most comprehensive study undertaken to estimate the losses from IUU fishing. It used published literature and 10 case studies to derive its estimates. While these are probably reasonably robust the authors made it clear that it is difficult to extrapolate from the case studies (which focus almost entirely on Africa) to achieve a global estimate.

[5] This estimate excludes discards and unreported legal catches.

products. The fisheries sector is of vital importance to many of the economies in the region. In these circumstances the potential for IUU fishing to have far-reaching economic and social consequences is high.

3.2. Drivers of IUU fishing

IUU fishing appears particularly common where governance is weak, domestic fisheries management arrangements poor (or poorly resourced) and where countries have failed to sign up to key international treaties and/or regional management arrangements. Frequently where they have committed to these they fail to implement even the most basic obligations. There are many factors which facilitate IUU operations and it is the combination of these which makes it a profitable and relatively low risk activity. Its persistence is due both to economic incentives (fuelled by increasing demand for seafood, continued overcapacity in many fishing fleets, a pool of cheap readily available labour, inappropriate subsidies and weak governance) and by the lack of global political resolve to tackle its underlying causes. For it is, at its heart, a profitable economic activity that has been assisted by globalization, which has allowed companies or their subsidiaries to be established and to operate in multiple countries (often with little or no controls), and has increasingly facilitated trade and opened up new intermediate and final markets.

The MRAG study found "a striking relationship between the level of governance of a country and its vulnerability to IUU" fishing. Using published estimates of governance it concluded that good governance appears to go hand in hand with good MCS systems and procedures, the political will to establish and enforce regulations, cooperation with neighbours on surveillance and participation in subregional and regional fisheries agreements (MRAG, 2005a).

3.3. Responses to IUU fishing

IUU fishers use their flexibility and entrepreneurial skills to stay one step ahead of the international community and fisheries managers. This is not particularly difficult in an environment where international law may be interpreted differently and the international community requires a broad degree of consensus and time before implementing new laws to counteract identified IUU activities. As quickly as new responses are developed and adopted IUU operators move to exploit other loopholes and areas where countries either do not have the will or resources to meet their international obligations. Over the last 15 to 20 years the international community has made concerted efforts to address the problems associated with weak international fisheries governance which have facilitated and encouraged IUU fishing. A range of new "hard" and "soft" law instruments has been developed and implemented.

3.3.1. International laws and protocols

Hard law refers to legally binding treaties of a global nature such as the United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS), the United Nations Fish Stocks Agreement (UNFSA)[6] and the FAO Compliance Agreement[7]. Once a country ratifies one of these laws or agreements it is legally bound to implement it fully through the development of appropriate domestic legislation and enforcing that legislation.

[6] Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks

[7] FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. This is part of the broader FAO Code of Conduct for Responsible Fisheries discussed in more detail in the next section.

Many of these instruments seek to elaborate the provisions of the UNCLOS that deal with the conservation and management of marine resources while maintaining the basic fishing entitlements of the Convention. The result is a patchwork quilt of measures in the form of binding and nonbinding instruments with differing geographical and legal reach and differing levels of participation and implementation.

The UNFSA is the most comprehensive global agreement relating to the conservation and management of high seas fish stocks. While individual countries may consider it deficient, it cannot reach its full potential unless the most important coastal, fishing and flag States are parties to it, and effectively implement it. Importantly, the UNFSA does not seek to impose any additional requirements on parties; in fact it is first and foremost an agreement for the purpose of implementing the provisions of the UNCLOS.

The need for greater participation in the UNFSA has been emphasised repeatedly in numerous resolutions of the UN and other international bodies.[8] It is surprising that some 14 years after its adoption and nearly seven years after it came into force, only 71 States have ratified it while some 156 States have ratified UNCLOS. The development of the UNFSA itself was recognition of the fact that the regime established by the UNCLOS was inadequate to deal with the continued depletion of the world's fish stocks, particularly straddling and high seas stocks. The FAO Compliance Agreement was adopted in 1993 and entered into force in April 2003 and currently has 36 acceptances.

In 2007 the FAO adopted a Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing (FAO, 2007a). This model scheme is now the basis of work to develop a legally binding instrument on Port State measures to prevent, deter and eliminate IUU fishing. When adopted, this agreement will further strengthen other instruments aimed at tackling IUU fishing.

The problem with any of these international instruments is that they cannot bind nonparties. The logic behind the UNFSA is to create a situation where global rules are applied on a regional basis, through regional organisations and that those who do not adhere to the rules established by the relevant RFMO may not fish. The obvious way around these arrangements is for operators to reflag their fishing vessels in States that are not members of the RFMO and to continue to exercise their freedom to fish on the high seas not bound by the conservation and management measures set by the RFMO. Unfortunately, despite the continued efforts by the international community to address these issues, loopholes remain. A process getting underway, sponsored by the FAO, to develop criteria for assessing the performance of flag States, and to examine the possible actions against vessels flying the flags of States not meeting such criteria, may help close some of these loopholes.

3.3.2. International protocols

Soft law refers to a growing number of nonbinding declarations, codes of conduct and plans of action, such as the FAO Code of Conduct for Responsible Fisheries and the IPOA-IUU Fishing. While these are generally easier to negotiate, their nonbinding nature gives countries the opportunity to appear committed to important arrangements while in practice often doing very little. However, this problem is not confined to soft law agreements, since some parties to binding international instruments also fail to meet their obligations fully.

[8] Most recently UN General Assembly (UNGA) resolutions A/RES/62/177/ and A/RES/62/215 of 2007, but also in UNGA A/RES/61/222 and A/RES/61/105, 58/14, 59/25 and 60/31 and a range of other fora including the FAO March 2005 Rome Ministerial Declaration on Illegal, Unreported and Unregulated fishing, the APEC Bali Plan of Action 2005 and the Report of the UNFSA Review Conference (A/CONF.210/2006/15) of July 2006.

To promote long-term sustainable fisheries, the FAO adopted, in 1995, the Code of Conduct for Responsible Fisheries. The Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation and management of marine resources, with due regard for the ecosystem. The Code recognises the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. An important element of the Code is the FAO Compliance Agreement discussed above.

To enhance the operation of the Code, the FAO developed four international plans of action (IPOAs). These are voluntary instruments which can apply to all States and entities and to all fishers. The four IPOAs are:

- IPOA for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds);
- IPOA for the Conservation and Management of Sharks;
- IPOA for the Management of Fishing Capacity; and
- IPOA-IUU Fishing.

The first three IPOAs were developed in 1997 as the Members of the FAO's Committee on Fisheries considered it necessary to have some form of international instrument to help manage compliance with the Code. The IPOA-IUU Fishing was developed in 2000 and adopted in March 2001. Individual countries are encouraged to develop and implement National Plans of Action (NPOAs) for each of these areas. While developing an NPOA is an important step in addressing each of these issues it is only effective if it is fully implemented and backed by appropriate sanctions.

A problem with all laws and protocols is that they require political will to implement their obligations and constant attention (and resources) to ensure they are being met. Despite the work which has gone into developing these arrangements the evidence suggests that they are patchy in coverage and many are poorly resourced or not being properly implemented. With this in mind, in 2003 the Round Table for Sustainable Development at the Organization for Economic Development organised a meeting on IUU fishing and invited fisheries ministers, industry and a range of civil society groups to participate. Following that meeting a small group of fisheries ministers decided that there needed to be more tangible action to tackle IUU fishing. They set up "A Ministerially-led Task Force on Illegal, Unreported and Unregulated Fishing on the High Seas"[9] which became known as the High Seas Task Force (HSTF). The aim of the Task Force was to undertake a rigorous analysis of the problem and develop a suite of practical and tangible measures to tackle the problem. The result was a comprehensive report and a set of well developed initiatives which Task Force members endorsed and then implemented with assistance from additional partner countries and organisations. A number of these initiatives are underway or have already been implemented and many of the key issues explored in the report are now receiving mainstream attention in international fora. Central to the success of the HSTF approach was the political commitment of the parties involved to identifying and implementing measure to address IUU fishing.

3.3.3. Market-based measures

One area which is receiving increased attention given the global nature of fish trade is the role that market-based measures may be able to play in reinforcing national or regional management arrangements. While inherently attractive, they suffer from many of the

[9] This comprised fisheries ministers from the Governments of Australia, Canada, Chile, Namibia, New Zealand and the United Kingdom, and Directors-General from WWF International, IUCN and the Earth Institute at Columbia University.

problems of other hard and soft law instruments. Without the cooperation of catching, port and market States, loopholes will inevitably develop and be exploited by unscrupulous companies and individuals. In developing market-based measures it was hoped that "the market" would differentiate between legal, sustainably caught product and product which cannot be identified as legally caught in sustainably managed fisheries. In this way purchasers of fish products would exercise their choice, and over time reduce the market demand for fish which could not be certified as legal and coming from sustainably managed fisheries.

Within this group of measures ecolabelling has received increased attention in recent years. One body which has been operating since 1999 is the Marine Stewardship Council (MSC). It has developed and implemented a system of evaluating and accrediting sustainable fisheries and allowing producers to market their products, using the MSC logo, as coming from sustainably managed fisheries. This initiative has taken several years to gain momentum however it currently covers some four million tonnes of seafood (7% of the world's edible wild-capture fisheries) and 850 products carry its logo in 34 countries. While the MSC approach has proved successful for some fisheries and enabled their products to be marketed as legal product coming from a sustainably managed fishery, it is unclear as yet whether this has allowed them to charge a premium for their product and recoup associated costs. The costs associated with MSC certification and renewal is significant and likely to limit the number of fisheries covered by this scheme. More recently, the FAO has developed guidelines for ecolabelling schemes which have been endorsed by members. This has lead to a number of other ecolabelling schemes being developed.

Some market States are also implementing new arrangements to address IUU fishing. In the USA, legislation taking effect from 1 January 2007 requires a biannual report to Congress identifying, among other things, nations whose vessels are engaged in IUU fishing. The legislation provides for those nations identified to be certified as having taken, or not taken steps to correct the IUU fishing activity. Where a nation is negatively certified, action, including prohibition of relevant fish imports from that nation into the USA may result (US Government, 2007).

Similarly, in June 2008, the Agriculture and Fisheries Council of the European Union (EU) agreed to establish a community wide system to prevent, deter and eliminate IUU fishing, to come into force from 1 January 2010. The proposal is aimed at halting importation of IUU fish products into the EU by monitoring the whole supply chain (fishing, transshipment, processing, landing, trade). Its main elements are:

- introduction of an EU "blacklist" of non-complying vessels, with detailed rules on the drawing up of such a list, the consequences of being included on the list and, in certain cases, the consequences for third countries harbouring such vessels;
- establishment of a certification scheme designed to cover all imports of fishery products with the exception of products derived from inland fisheries and aquaculture; and
- approximation within the Community of the levels of sanctions for serious infringements: a maximum fine of at least five times the value of the fishery products obtained by committing the serious infringement (Council of the European Union, 2008).

3.3.4. Trade-related measures

There is a range of measures which fall within this general heading. These include formal catch documentation schemes (CDS), trade documentation schemes (TDS), black and white lists of vessels, port and market State arrangements and trade bans on countries that do not respect or cooperate with established management arrangements.

Each one of these measures is designed to assist the management body in implementing agreed management and conservation measures. They have been developed to minimise the scope for unscrupulous operators to use loopholes in broader governance arrangements (particularly in high seas fisheries managed by RFMOs).

CDS seek to closely monitor catch from the point of harvest using documentation which, once issued, accompanies the product to its end market. They are probably the most effective of the current documentation schemes but can be subject to abuse via corrupt officials. Electronic CDS which use real time data (in some cases reconciling them with catch estimates) and more sophisticated security arrangements are less likely to be abused. TDS are a subset of CDS but are not as comprehensive or as effective. They do not monitor catch or where the catch is taken. They seek to monitor trade in the product but if this does not include all catches or all traded product this can result in significant loopholes. Like CDS they are subject to potential abuse via corrupt officials. Experience of TDS suggests that they are not particularly effective in minimizing IUU fishing.

Vessel lists have been developed and used by many of the RFMOs and also by some countries and nongovernment organisations. The lists fall into two broad headings. Black lists identify vessels known to have been involved in IUU activity and usually require the formal agreement of the RFMO members before vessels can be added to the list. While useful, they have some inherent deficiencies which stem from the process required for vessels to be added to the list and the ease with which vessel identity (including flag) can be changed. They are really only as effective as the quality and timeliness of the data provided by members of the RFMO and the time taken to have the vessel listed. White lists on the other hand are designed to list all those vessels which are permitted to operate in a fishery and have their catches freely traded, based on compliance with management and conservation measures. White lists suffer from the same inherent problems as black lists in so far as they must be kept current and updated constantly. Also just because a vessel is on a white list does not mean it may not have been involved in some form of IUU fishing, for example while it may be fishing legally it may have been under reporting catches.

Port and market State measures are designed to complement and reinforce the measures outlined above. In the case of CDS for example, a responsible port State would verify necessary documentation and check that the quantity landed was as specified in the documentation. It would then certify the documents as correct. The catch documents would accompany the product for the rest of its journey to intermediate and end markets. At each step during this journey the product would be cross checked with the documents. Finally, a responsible market State would only allow product to enter the country if all the documentation matched the product consignment.

Some RFMOs have been able to successfully limit trade in particular products to particular markets as a further means of reducing IUU fishing and reinforcing management and conservation measures. Trade bans will, however, only work for a small number of products with specific market characteristics.

3.4. Rights and responsibilities

Prior to UNCLOS entering into force international law underlined the status of the high seas as a global commons, to which individual sovereign States had been universally assigned access together with national responsibility for management and enforcement. With the advent of UNCLOS the international community recognised that along with the right to fish on the high seas came a series of responsibilities. Individual countries' responses to their rights and responsibilities have varied widely. UNCLOS is complex and multifaceted and its development required consideration of all aspects of ocean use and the very different and

diverse views of participating countries – coastal States, archipelagic States, island States, land-locked States and distant water fishing nations.

The dilemma is that there exists an inherent tension between the desire of the international community as a whole to ensure the long term sustainability of fisheries resources and the marine ecosystem which supports them, and individual national rights to freely access these same resources. This has proved difficult to accommodate particularly as management of these resources has tended to be regional and species specific and has frequently not included all necessary resources or those fishing for the resource.

States' rights and responsibilities are spelt out in more detail in Annex 2. While restating the rights of nationals of all States to fish on the high seas, UNCLOS makes it clear that this is subject to States meeting their treaty obligations, the rights, duties and interests of coastal States and the need to cooperate with other States in the conservation and management of living resources. These obligations place significant responsibilities on States. In this environment possibly the most important requirement is to fully implement the obligations of a flag State, for without control of a vessel flagged to a particular State it would be difficult for that State to fulfil most of the other significant responsibilities required under UNCLOS.

4. THE NATURE AND LEVEL OF IUU FISHING IN THE ASIA-PACIFIC REGION

4.1. Characterising IUU fishing in the Asia-Pacific region

This section draws on the available literature, on the case studies and on questionnaire responses to provide an overview of the nature and extent of IUU fishing in the Asia-Pacific region. An overview of the contribution of fishing to economies in the region and of the key species taken and their management is provided in Annex 3.

Fishing is a significant source of income, foreign exchange, employment and nutrition in many economies in the Asia-Pacific Region. Additionally, the Pacific Ocean is a source of more than 60% of the global marine capture production (FAO, 2008a). It is not surprising therefore that IUU fishing is considered a priority by many economies and by regional fisheries bodies in the region. The members of the FWG have confirmed this in supporting this study and seven of the eight regional fisheries body questionnaire respondents confirmed that IUU fishing was a priority for their members. The importance of IUU fishing in the Asia-Pacific has also been recognised in other fora and analyses. For example:

- Lungren *et al*. (2006) found that "IUU fishing is a major factor in the Asia-Pacific region and threatens not only the long term sustainability of fish stocks in the region but is currently imposing, and will impose in the future, significant economic and social costs to the countries of the region.";
- In 2006, tuna fishing representatives from four Melanesian economies "…believed that IUU fishing represents a major threat to the region's tuna resources and undermines stock assessment and management measures." (Forum Fisheries Agency (FFA), 2006); and
- Pitcher *et al*. (2006) assessed 53 countries against compliance with Article 7 of the Code of the Conduct for Responsible Fisheries. Nineteen of those economies are in the Asia-Pacific region. In relation to criteria concerning the occurrence of IUU fishing in their waters and the effectiveness of measures to control IUU fishing, the extent of illegal fishing was rated as 7/10 or higher (where 10 is the greatest extent) for 10 of the 19 economies. Not surprisingly, the effectiveness of controls on IUU fishing in these economies rated similarly poorly.

Despite the serious threat that IUU fishing poses to the Asia-Pacific region there are relatively few data that quantify the extent and the costs of IUU fishing and there are limited studies available on the nature of this fishing. The published literature and data available on IUU fishing in the Asia Pacific region generally relates to subsets of the region based on species or fisheries, economies or specific areas of water (see, for example, Clarke, 2007; De Young, 2006; Greenpeace, 2004; Khemakorn, 2006; Lungren *et al*., 2006; MRAG, 2005a; and Palma, 2006). The published information available is therefore piecemeal and is also variable in terms of its credibility.

Given that no previous studies have attempted to analyse IUU fishing in the broader Asia-Pacific region as defined in this project, this study has relied on information obtained from case studies and questionnaires as the primary data source. Questionnaire responses provided limited but useful insights into the nature and extent of IUU fishing in the region. In addition, three of the four case studies provided usable data and information on the nature and extent of IUU fishing. While these studies served to highlight key issues associated with IUU fishing and possible responses, they did not necessarily reflect all the key aspects of IUU fishing across the region as a whole. In particular, none of the case studies provided information on IUU fishing in the South Eastern Pacific subregion, which, given the absence of questionnaire responses from this area, constrained the analysis in relation to this part of the Asia-Pacific region.

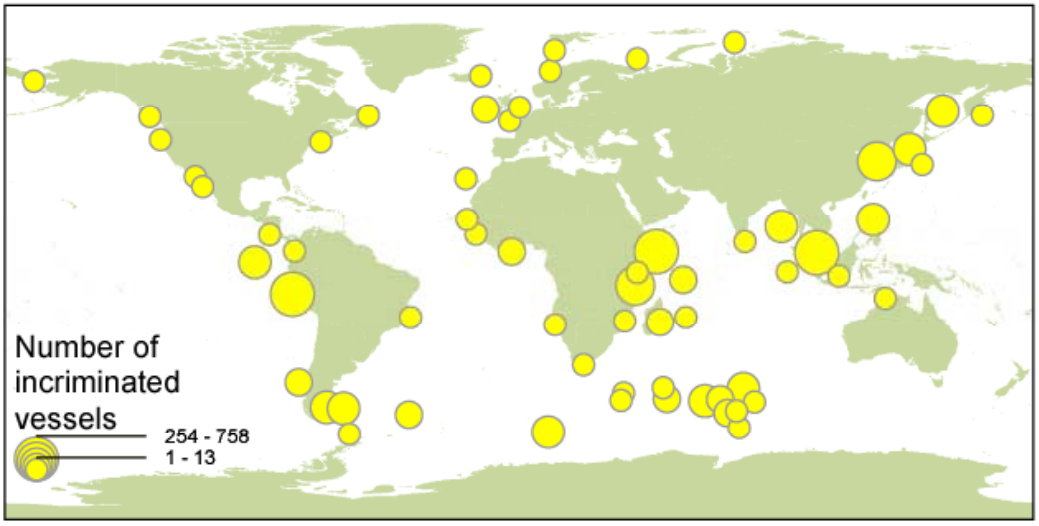
The assessment of the nature and extent of IUU fishing in the region relies heavily on the available public information on IUU fishing across the region and draws on questionnaire responses and the case studies wherever possible to inform the discussion on the location, form, drivers and extent of IUU fishing in the region.

4.1.1. Location of IUU fishing

A global assessment of IUU fishing found "hot spots" for arrests of illegal fishing in the South Eastern Pacific, the North West Pacific and South East Asia (MRAG, 2005a). Sumaila *et al*. (2006) have examined the spatial distribution of vessels incriminated in IUU fishing activities based on the Sea Around Us Project IUU fishing database (see Figure 1). It is clear that some of the most intense IUU fishing occurs in the Asia-Pacific region, in particular in Southeast Asia, the North Pacific and East Pacific. The assessments of Pitcher *et al*. (2006) also identified high levels of IUU fishing in countries in the North Pacific and Southeast Asia including China, Indonesia, the Philippines, the Russian Federation, Chinese Taipei, Thailand and Viet Nam.

The IUU fishing case studies, conducted as part of this project, reflect some of the "hot spots" identified in the above analyses. Case studies related to IUU fishing in the Sulawesi Sea, in east coast peninsular Malaysia and in Southeast Asia generally, as well as in the Kurile Islands in the North Pacific. Similarly, the review of media reports contained in Annex 4 supports the conclusion that Southeast Asia experiences a high level of detected IUU fishing. Economies in that subregion account for nearly 60% of the media reports. Economies in the Western and Central Pacific, notably some Pacific islands, accounted for a further 18% of the media reports.

Figure 1: Global illegal fishing incidence



Source: Sumaila *et al.* (2006)[10]

Eighty per cent of respondents to the APEC economy questionnaire confirmed that IUU fishing was occurring in waters under their jurisdiction. Sixty-six per cent identified that stocks that straddled their waters and the adjacent high seas, and stocks that straddled their EEZ and that of another economy, were subject to IUU fishing. However, respondents were not representative of all subregions and, in particular it should be noted that no members from the South Eastern Pacific subregion responded and that very few countries in the western and central Pacific Ocean (WCPO) are APEC members.

Within the Asia-Pacific region the relative frequency of IUU fishing within EEZs and on the high seas varies. For example in the Southeast Asian subregion and in much of the Convention Area of the Western and Central Pacific Fisheries Commission (WCPFC), there are limited opportunities for IUU fishing on the high seas due to the declaration of 200nm EEZs by many economies. Most IUU fishing in these areas tends to occur, therefore, within EEZs. In Southeast Asia, in particular, the boundaries of many EEZs abut, increasing the potential for incursions by vessels from neighbouring EEZs. In addition, a number of these boundaries are disputed, and this raises the opportunity for, and potential impact of, IUU fishing.

The FFA confirmed, in its questionnaire response, that most of the information on its Violations and Prosecutions Database in relation to the WCPO involved vessels that conduct IUU fishing in areas under national jurisdiction. However, despite the limited opportunities for high seas fishing in the WCPO, concerns have been raised about IUU activities in a 'pocket' of high seas water between the 200-mile exclusive economic zones of Papua New Guinea and the Federated States of Micronesia" (see, for example, Johnson, 2007 and Anon., 2008a).

In contrast, in the North Pacific and South Eastern Pacific subregions there are much larger areas of high seas and greater opportunities for IUU fishing on the high seas. For example,

[10] The Sea Around Us Project is currently attempting to update this map which is based on data up to 2003. However, the high number of IUU incidents (more than 2000 now compared to less than 500 in 2003) in the new database is proving a challenge for development of a map.

illegal driftnet fishing in the high seas in the North Pacific region remains a problem with some evidence that this may now be encroaching the northern waters of the WCPFC.

4.1.2. Forms of IUU fishing

IUU fishing can be characterised, broadly, as:

- IUU fishing in domestic waters by domestic vessels
- IUU fishing in domestic waters by foreign vessels
- IUU fishing on the high seas

Further, as discussed in Section 2, IUU fishing may be illegal and/or unreported or unregulated. Most of the studies of IUU fishing in the Asia-Pacific region have, either intentionally or by default, focused on illegal fishing or have failed to clearly identify which form or forms of IUU fishing they relate to.

Only eight economies responded to questions on this issue. Of those, five indicated that all three forms of IUU fishing were occurring in their waters. Three indicated that only illegal and unreported fishing was occurring in their waters. However, the responses indicated that illegal fishing by both domestic and foreign vessels within EEZs was the most common form of IUU fishing with both small-scale and industrial vessels involved in this activity. The responses indicated that economies generally had a much better understanding of the nature, extent and reasons for IUU activity by domestic vessels than by foreign vessels.

According to the responses, domestic IUU fishing related to fishing without authorization, fishing in closed areas, using prohibited methods, retaining prohibited species, exceeding catch limits and failing to comply with bycatch or reporting regulations. However, only two of the eight respondents considered that domestic illegal fishing had a significant impact. Responses from members in the Southeast Asian subregion pointed to other flag States in that subregion as the main source of illegal foreign fishing within their EEZs.

Questionnaire responses included few details of unreported fishing and provided limited insight into high seas IUU fishing with the main references to the latter relating to the use of large scale drift nets in the North Pacific.

Based on questionnaire responses, case studies and the available literature there appears to be considerable similarity in the nature of IUU fishing across the region. Economies in the Southeast Asian subregion have been the subject of a number of analyses of IUU fishing in the recent past (see, for example, Asia-Pacific Fisheries Commission (APFIC), 2007; FAO, 2004; Greenpeace, 2007; Morgan *et al*., 2007; Palma and Tsamenyi, 2008; Sea Resources Management, 2008; Williams, 2007;). These analyses demonstrate that the most important forms of IUU fishing in countries in that subregion are:

- use of prohibited gears and methods (dynamite, poisons, push nets, small mesh)
- unauthorised fishing in management zones
- unauthorised fishing in closed areas/seasons
- illegal fishing by foreign fishing vessels
- unreporting/misreporting of catches especially by foreign vessels
- use of unauthorised vessels/gears
- fishing with fake licences or vessel registration
- fishing unauthorised species

- landing in unauthorised ports
- catch of protected species

Likewise, in China, the IUU fishing most commonly observed involves the use of illegal gear, fishing enclosed areas and seasons, catches of illegal or undersized species, and most notably vessels without the required authorization (Yu and Yu, 2008).

In the WCPO the nature of the problem is also similar. In Pacific island countries, the main IUU fishing issues are nonreporting and misreporting of catches, unauthorised fishing, encroachment by foreign fishing vessels, fishing for unauthorised species and undersized species, use of prohibited gears and fishing methods and fishing endangered and protected species (FAO, 2005a). In the WCPO more broadly there have been claims of substantial IUU fishing for tuna by both licensed and unlicensed vessels (Greenpeace Australia Pacific, 2006a; Greenpeace, 2007).

The above observations are supported by the media reports of IUU fishing in the Asia-Pacific region (Annex 4) which relate almost entirely to illegal fishing carried out in domestic waters with reports divided evenly between IUU fishing by domestic and foreign vessels. IUU fishing activity by foreign vessels included:

- taking fish in excess of quota
- taking prohibited species
- taking endangered species
- use of illegal methods
- fishing without authorization
- misreporting
- failure to operate a vessel monitoring system (VMS)
- shark finning violations

There is notably less information available on IUU fishing from the South Eastern Pacific. This is true of both the literature and the information available from questionnaire responses and case studies. However, the relatively small number of media reports identified for this subregion suggests that illegal fishing in protected areas, particularly for sharks, is a significant problem in this subregion.

There were very few media reports of IUU fishing on the high seas in the Asia-Pacific region although examples include the use of illegal driftnets in the North Pacific and operating without authorization in the Convention Area of the WCPFC. While the trend in sightings of unauthorised large-scale high seas driftnet fishing operations in the North Pacific Ocean is downward, surveillance activities in the region indicate that since 2003 the IUU fishing threat in the North Pacific is shifting from salmon to squid, albacore tuna and sharks. (National Marine Fisheries Service (NMFS), 2007).

Most of the reports and information available on IUU fishing in the Asia-Pacific region relates to illegal fishing rather than unreported or unregulated fishing, although there are examples of these occurring. The nature of the offences varies widely and this variation is generally apparent across the region, although some offences, such as the use of poisons and cyanide, appear to relate predominantly to domestic operations in the Southeast Asian region.

4.1.3. Drivers of IUU fishing

Globally, the quality of MCS and the level of governance have been identified as the two main determinants of the vulnerability of a country to IUU fishing (MRAG, 2005a). The literature and case studies on IUU fishing in the Asia-Pacific region (see for example, Lungren *et al*. 2006; Morgan *et al*., 2007; Palma and Tsamenyi, 2008; Sea Resources Management, 2008; Tsamenyi *et al*., in press; Williams, 2007), as well as questionnaire responses suggest that those findings are relevant in the Asia-Pacific context. However, these sources also suggest that there are a number of other significant factors at play in the region that either drive or facilitate IUU fishing activity. These, interrelated factors, include:

- overfishing of resources;
- lack of comparable alternative employment opportunities;
- government policies that provide incentives for increased fishing;
- lack of agreed maritime boundaries;
- ineffective flag State control and MCS measures;
- the nature of access arrangements for foreign vessels;
- buoyant market conditions for fish products; and
- national and regional governance.

The factors driving IUU fishing may also be specific to particular economies or cultures. For example, on the east coast of Peninsular Malaysia, specific drivers of IUU fishing include:

- fuel smuggling;
- fish smuggling;
- corruption;
- human traffic for fishing crew;
- cultural attitudes to hierarchy and authority;
- the influence of ethnicity in business dealings; and
- cultural tolerance for 'rule bending' (Sea Resources Management, 2008).

Sea Resources Management have constructed a DPSIR model for the east coast of Peninsular Malaysia which capture the factors at work and their role in the causal chain of IUU fishing (See Figure 2).

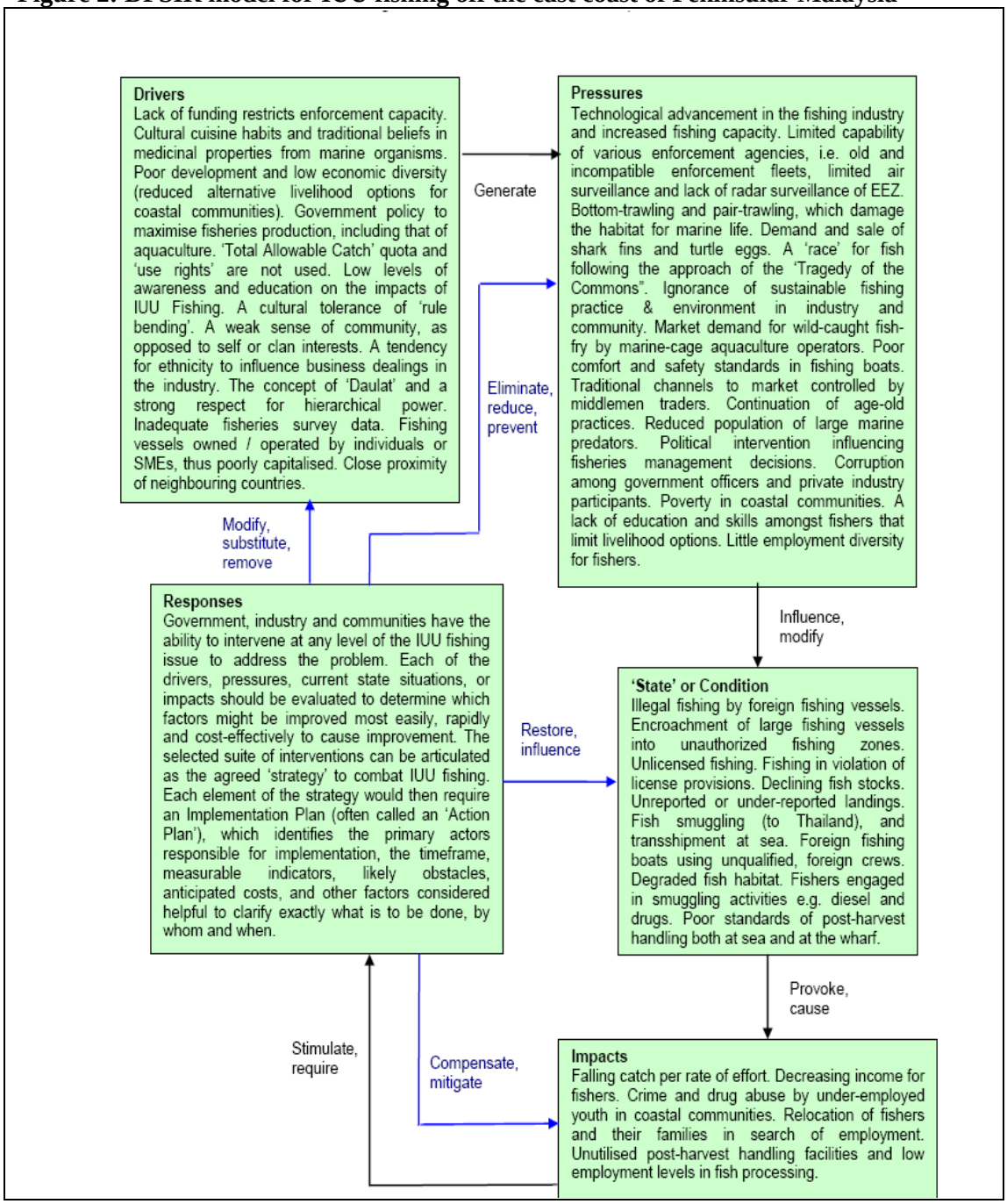
Overfishing and stock status

According to FAO estimates (FAO, 2005a) nearly 80% of global fish stocks are fully exploited, overexploited or depleted. The potential for IUU fishing to put fish stocks at risk is therefore high. Fish stocks in the Pacific Ocean assessed by the FAO, on the basis of 2002 data, and by Maguire *et al*. (2006),

> "it is clear that foreign IUU fishing in the region occurs to the extent that it does because (a) historically, the lack of management of fishing capacity within countries EEZs (and the resulting decline in fish stocks) results in vessels looking outside EEZs for catches …. This has often been encouraged by government policies that provide subsidies for building 'offshore' vessels; and (b) there are opportunities for IUU fishing because there are generally weak national governance structures and MCS capacity to control 'foreign fishing' and IUU fishing by nationals, foreign fishing access arrangements differ widely with the result that some countries are 'easy pickings' for illegal foreign fishing and there is a lack of a regional structure to coordinate data collection and assessments to guide regional management"
> Morgan *et al.* (2007)

as fully exploited, overexploited or depleted are summarised in Table 3. The status of many other stocks is unknown. Of the 10 species identified separately as contributing most to Pacific Ocean catch (as identified by FAO in Table A3.2 Appendix 3), five (anchovetta, largehead hairtail, Alaska pollock, yellowfin tuna and Chilean jack mackerel) are considered to be fully to overexploited or depleted. Questionnaire responses from members identified 45 stocks/fisheries that comprised their major commercial fisheries in the Pacific Ocean. Of those, respondents classified 1 as overfished, 19 as fully fished, 16 as unknown and 9 as underfished.

Figure 2: DPSIR model for IUU fishing off the east coast of Peninsular Malaysia



Source: Sea Resources Management (2008).

Table 3: Status of fish stocks in the Pacific Ocean

Fishing Area/ Species	Status[11]	Main fishing countries	RFMO responsible
Northwest Pacific			
Largehead hairtail	Fully exploited to overexploited	China	
Alaska (Walleye) pollock	Fully exploited		Convention on the Conservation of Pollock Resources in the Central Bering Sea (CCBSP)
Flying squid, Boreal clubhook squid and Boreopacific armhook squid	Moderately to fully exploited		
Pacific Ocean perch	Depleted		
Northeast Pacific			
Alaska (Walleye) pollock	Fully exploited		
Chinook salmon	Fully exploited to overexploited	USA, Canada	North Pacific Anadromous Fish Commission (NPAFC)
Coho salmon	Fully exploited to overexploited	USA	NPAFC
North Pacific hake	Underexploited to depleted		
Pacific Herring	Moderately exploited to overexploited	USA, Canada	
Other shrimps	Fully exploited to depleted	-	
Western Central Pacific			
Lizardfishes	Moderately exploited to overexploited	Thailand, Indonesia, Malaysia, The Philippines	
Ponyfishes	Moderately exploited to overexploited	Indonesia, The Philippines	
Giant tiger prawn	Fully exploited to overexploited	Indonesia, Australia	
Southwest Pacific			
Orange roughy	Fully exploited to overexploited	New Zealand	South Pacific RFMO (SPRFMO)
Oreo dories	Fully exploited to overexploited	New Zealand	SPRFMO

[11] Moderately Exploited is defined as "Exploited with a low level of fishing effort. Believed to have some limited potential for expansion in total production." Fully exploited is defined by FAO as "The fishery is operating at or close to optimal yield level, with no expected room for further expansion"; Overexploited is defined as "The fishery is being exploited at above a level which is believed to be sustainable in the long term, with no potential for further expansion and a higher risk of stock depletion/collapse."; and Depleted is defined as "Catches are well below historical levels, irrespective of the amount of fishing effort exerted" (FAO, 2005c).

Fishing Area/ Species	Status[11]	Main fishing countries	RFMO responsible
Silver gemfish	Fully exploited to overexploited	New Zealand, Australia	
Flying fish	Fully exploited		
Eastern Central Pacific			
Miscellaneous coastal fishes	Moderately exploited to overexploited		
Shrimps and prawns	Fully exploited to overexploited		SPRFMO
Jumbo flying squid	Moderately to fully exploited		SPRFMO
Southeast Pacific			
Patagonian grenadier	Fully exploited to overexploited	Chile	
South Pacific hake	Fully exploited to depleted	Chile, Peru	
Southern hake	Fully exploited to overexploited	Chile	
Anchovetta;	Overexploited to depleted	Peru, Chile	
Auracanian herring	Fully exploited to overexploited	Chile	
South American pilchard	Fully exploited to overexploited	Chile, Peru, Ecuador	
Eastern Pacific bonito	Overexploited to depleted	Peru	Inter-American Tropical Tuna Commission (IATTC)
Chilean jack mackerel	Fully exploited to overexploited	Chile, Peru	SPRFMO
Chub mackerel	Moderately to fully exploited		SPRFMO
Tuna and tuna-like species			
Albacore (Northern Pacific)	Fully exploited		WCPFC
Albacore (Southern Pacific)	Fully exploited		WCPFC
Bigeye tuna (Eastern Pacific)	Overexploited		IATTC
Bigeye tuna (Western and Central Pacific)	Fully exploited		WCPFC
Pacific bluefin tuna (Pacific)	Overexploited	Japan, Chinese Taipei, Mexico	WCPFC
Southern bluefin tuna (Including in the Pacific)	Depleted	Japan, Australia New Zealand, Chinese Taipei, Indonesia, Korea	Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

Fishing Area/ Species	Status[11]	Main fishing countries	RFMO responsible
Yellowfin tuna (Eastern Pacific)	Fully exploited		IATTC
Blue Marlin (Pacific)	Fully exploited		WCPFC

Source: FAO (2005c); Maguire *et al.* (2006)

Various studies have identified overfishing as a serious issue in subregions of the Asia-Pacific. For example, Pomeroy *et al*., (2007), and Williams (2007) have noted the impacts of overfishing in Southeast Asian countries such as Indonesia, Thailand, the Philippines and Viet Nam. Williams cites the following examples of overfishing:

- Indonesia's marine resources are close to fully exploited and some are overexploited;
- the density of fish in the Gulf of Thailand declined by 86% between 1961 and 1991;
- fishing capacity has tripled in Viet Nam yet catch has only doubled and in the Gulf of Tonkin, where resources are shared with China, catch rates declined by 75% between 1985 and 1997; and
- catch rates in the Philippines have dropped as low as 10% of original levels.

In Southeast Asia there is some evidence of 'serial depletion' as fishing fleets from economies with severely overfished resources seek to maintain catch by fishing illegally in the waters of nearby countries adding to fishing pressure and the likelihood of overfishing in those waters. Heazle and Butcher (2007) note that Indonesia's marine resources have effectively become "the last frontier not only for Thai trawlers but also for Taiwanese longliners and Philippines purse seiners."

> "In effect, Southeast Asian fisheries are still operating with an open access fisheries growth paradigm that does not match the current status of their resources and environments." (Williams, 2007).

Overall, the status of a number of economically important fish stocks in the Pacific Ocean is of concern and it is clear that overfishing has caused significant declines of stocks in waters under national jurisdiction, of highly migratory stocks and of straddling stocks in the region. There is no indication that this situation is improving and under these circumstances the incentive for IUU fishing by vessels located within the region is likely to increase. The apparent abundance of stocks in the Pacific, relative to that in other oceans is also likely to mean that stocks, particularly those in the Western and Central Pacific, will come under increased pressure from IUU fishers from outside this region. The potential for IUU fishing to compromise the long-term sustainability of healthy stocks in the Pacific Ocean and to undermine efforts to rebuild others is therefore high.

Failure to manage stocks to sustainable levels, together with failure to manage fishing capacity so that it reflects available resources, creates an environment where operators seek to maintain a return to their investment in fishing vessels and gear or to maintain their level of subsistence catch by flouting regulations that limit their access to resources. Williams (2007) and Pitcher *et al.* (2006) cite the example of Indonesian fishers' incursions into the waters of neighbouring countries as being symptomatic of their displacement from traditional fishing grounds by overexploitation, by both domestic fisheries and by legal and illegal fishing by foreign vessels, of stocks in Indonesian waters. The problem of poor domestic management ultimately creating problems for others, applies on a regional basis as well. The FFA has identified the lack of effective management and/or enforcement in the Eastern Pacific Ocean as a driver for recent reported incursions of purse seine vessels from the IATTC area into the WCPFC Convention Area (FFA, 2008).

The literature and media reports (Annex 4) suggest that most of the IUU fishing in the Asia-Pacific is carried out by vessels flagged from within the region. However the Asia-Pacific region is also affected by IUU fishing by vessels flying the flags of economies outside the region. Reduced access to resources in other oceans is placing increasing fishing pressure, both legal and illegal, by distant water fishing nations on stocks in the Pacific Ocean. Comparatively, the status of marine resources in the Pacific Ocean is better than that of those in the Indian and Atlantic Oceans. The reality is that with excess capacity in many domestic and high seas fisheries and fleets, and countries not meeting their obligations to manage that capacity, the excess goes to where the returns are likely to be highest and/or where governance is weak and the risk of detection perceived to be low.

Similarly, the detection of vessels flagged to Asia-Pacific economies in waters of African countries, for example, is indicative of the impact of declining stocks due to poor management and enforcement in domestic waters and a failure of these flag States to appropriately control the operations of their vessels. As at September 2008 over 50% of the vessels identified on Greenpeace's Vessel Blacklist were flagged to countries in the Asia-Pacific region (Greenpeace, 2008).

Somewhat ironically, attempts to better manage fish stocks, by imposing restrictions on catch or effort increase the incentive for IUU fishing in the absence of alternative employment or investment opportunities and strong enforcement (see for example, FFA, 2008). Questionnaire responses indicated that this applied equally to IUU fishing by domestic and foreign operators.

Perverse incentives

Rather than, or in parallel to attempts to, manage fishing capacity and control catch or effort, some economies continue to provide incentives for increased fishing capacity through the use of vessel or fuel subsidies and the adoption of fisheries production targets. For example, in one instance, fishermen are eligible for subsidised fuel but the enforcement agency must pay the market price (Sea Resources Management, 2008). In such an environment, fishing operators can hardly be expected to adopt a more conservative and long-term approach to exploitation of fisheries and the already difficult task of management and enforcement agencies to implement and enforce effective management becomes even harder.

In making a decision to undertake IUU fishing, operators take into account the risk of detection and the potential penalties as well as comparing the potential returns from IUU fishing with available returns from other economic activity. For small-scale and/or subsistence operators and crew the availability of alternative employment may be low and, significantly, remuneration may not be as attractive as that available from IUU fishing. For example, Yu and Yu (2008) noted that, in China, the average income for a fisherman of around $US500-800/year is as much as double a farmer's earnings and that until alternative jobs pay a higher wage there will be demand for work on IUU fishing vessels. This is consistent with findings elsewhere in Asia suggesting that there is migration of farm workers to the coast seeking employment and creating a ready supply of crew for IUU fishing vessels (see, for example, APFIC, 2007).

An analysis of the IUU fishing vessels lists of RFMOs revealed that as at March 2008, 23 of the 79 vessels on these lists were flagged to Asia-Pacific economies including: Cambodia (2); Colombia (1); Indonesia (11); North Korea (3); and Panama (7) (Gianni, 2008).

Markets

It is not only declining abundance of fish stocks that drives fishers to undertake IUU fishing. At the same time as stocks are being depleted, and/or more highly regulated, the demand for fish products continues to increase and returns from some products make the benefit/cost ratio

associated with IUU fishing, including the risks associated with apprehension, increasingly positive in many cases. Both the supply of and the demand for fish, for human consumption, aquaculture feed and for aquaria, are driving IUU fishing. In addition, to maximise their returns and to balance the risk and consequences of detection, IUU fishing tends to focus on high value products.

Risk of detection

The risk of detection and the potential consequences are a function of a number of factors including:

- the nature and level of fisheries management;
- the political and financial commitment to enforcement of fisheries management arrangements;
- the sophistication of MCS measures; and
- the integrity of fisheries management, enforcement and judicial officers.

IUU fishers will target those areas where fisheries management and the capacity and/or will to enforce management arrangements are perceived as weakest.

IUU fishers will exploit potential weaknesses in maritime arrangements including, in particular, the lack of agreed maritime boundaries in some areas and inconsistency of management, administrative and policy measures across national 'boundaries' which provide fertile ground for IUU activity (Tsamenyi *et al*., in press). This issue is of particular relevance to Southeast Asian economies, where, in terms of the number and complexity of overlapping jurisdictional and sovereignty claims, the waters are perhaps the most disputed regional seas in the world (Schofield, unpublished). In this region, even where foreign fishers are apprehended violating the law, they are sometimes not prosecuted because of political influence that is sensitive to unclear maritime boundaries (Sea Resources Management (2008). A summary of the agreed and undelimited maritime boundaries in Southeast Asia, East Asia and the South Pacific is provided in Annex 5. The literature identifies that many of the undelimited boundaries are areas associated with illegal fishing. For example: between Indonesia and Malaysia (in the disputed border adjacent to the Sipadan and Litigan Islands); around East Timor; shared boundaries with Australia; the maritime boundary around Palau; in the South China Sea (particularly in relation to claims to part or all of the Spratly Islands); and the Kurile Islands (Krause, 2008; Williams, 2007; Palma and Tsamenyi, 2008; Zeller, 2008).

The Philippines has an elaborate MCS framework but many of its components have not been implemented and there is a lack of coordination across government agencies in implementation of MCS activities. Palma (2005) identified the need for the Philippines to:

- Improve data collection, fishing vessel registration and licensing systems
- Establish VMS and observer programmes
- Strength the border and inspection regime
- Institute sanctions with sufficient severity
- Create an effective coordination mechanism for implementation of MCS activities
- Ensure MCS focuses on both coastal and offshore and national and foreign fleets
- Allocate budget funding for implementation of integrated MCS systems

Many of the questionnaire responses received were from developed economies and the extensive range of MCS measures in place in those economies is unlikely to be representative of economies across the region. However, lack of effective MCS measures and the failure of administrative and judicial penalties to reflect the gravity of IUU fishing are commonly cited as facilitating IUU fishing in the region (APFIC, 2007; FAO, 2004).

Various studies have demonstrated the need for strengthening of MCS systems in the region(including through strengthening underlying legislation) to improve the capacity of flag States to manage the operations of their vessels in domestic waters and when operating remotely from the flag State, and to defend their maritime territory from incursions by foreign vessels (see for example, DAFF and MMAF, 2008; Krause, 2008; Palma and Tsamenyi, 2008). At the regional level, reaching agreement on effective MCS measures, such as catch documentation schemes, observer programs and control on transhipment, can prove difficult putting high seas and migratory stocks at greater risk of IUU fishing.

Access arrangements

While many of the drivers of IUU fishing are common across the Asia-Pacific region their relative importance may vary between economies and between subregions. For example, in Pacific island economies, which allow access to foreign vessels subject to payment of access fees, such fees are often linked to catch or effort. This establishes a key incentive for under-reporting of catch or effort and hence IUU fishing (FFA, 2008).

Governance

In addition, socio-economic conditions and the levels of effective governance in place vary across economies in the region and these factors can create an environment conducive to facilitating IUU fishing. For example, lack of transparency in government decision making, poorly paid officials, reliance on foreign aid, differences in cultural attitudes and declining standards of professionalism and ethical conduct within the public service, provide fertile ground for corruption in relation to the administration of fisheries management and fisheries access arrangements (see for example, Palma and Tsamenyi, 2008; Tsamenyi and Hanich, 2008; Sea Resources Management, 2008). In many cases the penalties in place for IUU fishing are insufficient to deter IUU activity. This problem is not restricted to the Asia-Pacific region. A review of cases of IUU fishing by Sumaila *et al.* (2006) showed that fines must be increased 24 times to deter illegal fishing.

> "Corruption was raised by almost every interview as a factor affecting the industry. Examples given, included the alleged payment to officials to distort fish landing statistics, improper behaviour by officials who administer the fuel subsidy system, and the role of patronage and corruption in the issue of fishing licences" (Sea Resources Management, 2008)

4.1.4. Species affected

The species affected by IUU fishing in the Asia-Pacific region varies by subregion. The available literature, case studies and questionnaire responses suggest that the following species are key IUU species in certain regions and countries:

1. North Pacific
    - Alaska pollock, salmon, tuna, sea urchins, crabs and squid (domestic and high seas IUU fishing)
    - cod, lobster, Greenland halibut and Greenland Salmon in Canada (unreported foreign fishing)
2. Southeast Asia
    - tuna, particularly yellowfin and skipjack, billfishes, other pelagic fish, shark, corals and marine mammals in the Sulawesi Sea (illegal foreign fishing)

- reef fish such as Humphead (Napoleon) wrasse (listed in Appendix II of the Convention in International Trade of Endangered Species of Wild Fauna and Flora (CITES)), and groupers off the Philippines and Indonesia (for example by illegal cyanide and blast fishing by domestic operators)
- shark, scalefish, tuna and billfish in Australia (domestic unreported fishing)
- abalone and rock lobster in Australia (domestic illegal fishing)
- trepang (sea cucumber), trochus, finfish, shark and shark fin, and sawfish meat and rostra in northern Australian waters (illegal, unreported foreign fishing)
- cockle spat, turtle eggs, arowana (listed in Appendix I of CITES) and shark fin in east coast Peninsular Malaysia (domestic illegal fishing)
- grouper fry and turtle bycatch in east coast Peninsular Malaysia (unreported domestic fishing)
- lobster in east coast Peninsular Malaysia (unregulated and unreported domestic fishing)
- sharks and turtles in Malaysia (illegal foreign fishing)
- sedentary species, tuna, reef finfish, prawns, lobster in Papua New Guinea (illegal domestic fishing)
- tuna and shark in Papua New Guinea (unreported domestic fishing)
- tuna, sharks, squid and lobster in Papua New Guinea (illegal and unreported foreign fishing)

3. Western and Central Pacific
    - tunas, billfish and sharks in the Western and Central Pacific (foreign illegal and high seas unregulated fishing)
    - abalone, swordfish, hapuka, bass, hoki in New Zealand (domestic illegal fishing)
    - hoki, ling, southern blue whiting, orange roughy in New Zealand (unreported domestic fishing)
4. South Eastern Pacific:
    - abalone, sharks and sea cucumbers (domestic IUU fishing and high seas unregulated)
    - jumbo flying squid off Peru (foreign illegal and high seas unregulated)
    - hake in Chile (domestic IUU fishing)

Most of the species identified are relatively high value species. For example, tunas, billfish, sharks (reflecting the high value of fins rather than meat), reef fish, lobster and abalone figure frequently in the above list. However, it is apparent that there are variations in the species affected by IUU fishing on a subregional basis. While this may reflect species distribution it may also reflect the nature of the IUU fishing, for example the species targeted by domestic subsistence or small-scale IUU fishers may be different from those targeted by industrial IUU fishers.

4.1.5. The extent of IUU fishing

A common finding of much of the published work on IUU fishing in the region is that there remains considerable uncertainty about the level of IUU fishing and the threat that it poses to

the economic, social and environmental well-being of the region (see, for example Clark, 2006; Greenpeace Australia Pacific, 2006b; Lungren *et al*., 2006.)

Based on the MRAG (2005a) estimates of the value of global IUU fishing, Lungren *et al*. (2006) have estimated that IUU fishing in the Asia-Pacific region[12] costs around US$5.8b annually. More recently, the head of the Malaysian International Tuna Port has estimated that the annual economic losses from IUU fishing in the Asia-Pacific are over RM15billion (approximately US$4.5b) (Datuck Annuar Zaini Binyamin, 2007).

The most consistent assessment of IUU fishing across the Asia-Pacific region as a whole puts the quantity of fish taken by IUU fishing at between 3,447,000t and 8,123,000t per annum (MRAG and UBC, 2008). This represents between 8 and 16% of the total reported catch of around 51,000,000t from the Pacific Ocean in recent years. That study found that:

- illegal fishing is increasing in the Northwest Pacific although there is considerable uncertainty around the estimates;
- illegal catch in the Northeast Pacific is low and steadily declining;
- in the Western and Central Pacific (including Southeast Asia) IUU fishing is occurring at relatively high and constant levels;
- increased MCS by coastal States in the South West Pacific has led to a significant reduction in illegal fishing over the last 20 years; and
- while it is likely that there have been some reductions in IUU catch in the Southeast Pacific, the general level of illegal fishing is higher there than in the Western Pacific.

A range of other estimates, of varying levels of credibility, are available for specific economies or subregions in the Asia-Pacific region. The estimates available are summarised in Table 4. These estimates cannot be aggregated to provide an overall estimate of IUU catch in the region since they relate to different periods, do not have a common basis for their estimation and undoubtedly overlap in terms of regions and species.

Table 4: Estimates of IUU fishing in the Asia-Pacific region

Region/subregion/ economy to which estimate relates	Time period	Estimate	Source
The Pacific	Not specified	NZ$570m/year (US$370m)	Peters (2006)
North Pacific			
Northwest Pacific	Average 2000-2003	1,325,763t – 3,505,942 t valued at US$1,193-3,155m	MRAG and UBC (2008)
Northeast Pacific	Average 2000-2003	2,326 t – 8,449t valued at US$2-8 m	MRAG and UBC (2008)
Kurile Islands	2004-2006	11,500t/year of sea urchin (*Strongylocentrotus intermedius*)	Krause (2008)
Russia	1994-2000	Estimated loss of trade through illegal activity US$1-5b/year	Various sources cited in Vaisman (2002)

[12] The analysis by Lungren *et al.* (2006) includes a number of countries, including South Asian countries, that are not included in the definition of Asia-Pacific adopted in this report.

Region/subregion/ economy to which estimate relates	Time period	Estimate	Source
Russia	2003-2005	The median quantities of annual excess catch of sockeye salmon were estimated to range from 8,000 to 15,000t representing a value of US$40 to 76m	Clarke (2007).
Russia-Japan		Value of IUU fisheries between Russia and Japan is estimated at US$800m/year	Intrafish cited in Krause (2008)
Russia Far East Basin	2005	Economic loss of illegal catch of Alaska pollock, king and blue crabs amounts to at least US$700m/year	Glotov and Blinov (2006)
Southeast Asia			
Australia (Illegal foreign)	2006/07	260 kg of trepang; 200kg of trochus; 33.5t of fish and 140 fish; 18t of whole shark and 30 whole shark; 1.6t shark fin and 3500 shark fins; 10kg sawfish/bills	Questionnaire response
Indonesia	Not specified	US$4 billion/year	Anon. (2002) cited in Khemakorn (2006)
Indonesia	2003	US$103.3m	Anon. (2003) cited in Palma and Tsamenyi (2008)
Indonesia	Not specified	Purse seine and longline catch of large pelagic US$153,604	Dr. Purwanto pers. comm. cited in Palma and Tsamenyi (2008)
Indonesia	Not specified	Cyanide fishing costs Indonesia around US$46m/year	De Vantier *et al*. (2004)
Indonesia	Over 20 years	Estimated cost of blast fishing is US$3b	Pet-Soede *et al*., (1999) cited in Palma and Tsamenyi (2008)
Indonesia	Annual	Losses of 875b Indonesian Rp in North Sumatra Province	UNGA (2008) citing Kompas Cyber Media, 22 January 2008)
Indonesia	Annual	Rp30 trillion (US3.26b) lost to fish poaching annually	Director General of Monitoring and Control, MMAF (Anon, 2008b)
Indonesia and the Philippines	Not specified	US3b/year	Tsamenyi *et al*. (in press)
Indonesia	2005	US$3.3b	Staples and Morgan (in.prep.)

Region/subregion/ economy to which estimate relates	Time period	Estimate	Source
Papua New Guinea (Illegal and unreported)	Not specified	Estimated annual IUU catch of nearly 6,000t of tuna, 400t of shrimp, 6,000t of sharks, 2,000t of beche-de-mer and 11,000t of demersal/coastal finfish valued in total at US$26.55m.	MRAG (2005a)
Papua New Guinea (Illegal domestic)	2006/2007	2t of sedentary species (US$180,000); 900t of tuna (US$90,000); 15t reef fin fish (US$35,000)' 10t of prawns/lobster (US$60,000)	Questionnaire response
The Philippines	Not specified	PhP50b or US$894m	Alino (2002) cited in Khemakorn (2006).
The Philippines	Not specified	PhP11bor US$196.5m	De Leon (2004) cited in Khemakorn (2006)
The Philippines	January 2003-June 2004	90% of the 534 foreign vessels operating in its waters were engaged in illegal fishing Illegal catch of tuna in one area alone is around US$1b/year	Draft Philippines' NPOA-IUU fishing cited in Palma (2006)
The Philippines	Not specified	80,000t of fish and other marine resources lost annually to foreign IUU fishing	Palma and Tsamenyi (2008)
The Philippines	Not specified	Average annual revenue loss due to local and foreign illegal fishing is estimated at US$1.6m.	Estimate of Philippine Navy cited in Palma and Tsamenyi (2008)
Sulawesi Sea	2003	IUU fishing conservatively estimated at one-third of the total annual value of marine fisheries, i.e. US$227m	Palma and Tsamenyi (2008)
Sulawesi Sea	The five year period to 2007	25,729kg of fish and 200 sacks of coral valued at US$76,789 were confiscated	Apprehension records of Indonesia, the Philippines and Malaysia cited in Palma and Tsamenyi (2008)
Western and Central Pacific			
Western and Central Pacific Ocean	2002	5-15% of the WCPO catch (equating to 100,000 to 300,000 t) annually valued at US$134-400 m	Greenpeace (2004)
Western and Central Pacific Ocean	2004/2005	10% of FFA aerial surveillance sightings in 2004 and 12% in 2005 were unlicensed. Main problems in Palau and Federated States of Micronesia	Agnew (2005)

Region/subregion/ economy to which estimate relates	Time period	Estimate	Source
Western and Central Pacific Ocean	2008	Assuming that 10% of the longline catch is IUU catch, and that the species mix of IUU catch is the same as legal catch, IUU longline catch is valued at around US$100m annually. If 10% of the skipjack catch (taken by purse seine) is IUU catch this could represent IUU catch of US$96m (based on a price of US$800/t)	FFA (2008)
Western Central Pacific	Average 2000-2003	785,897t – 1,729,588t valued at US$707m-1,557m	MRAG and UBC (2008)
Southwest Pacific	Average 2000-2003	5,227t-32,848t valued at US$5m-30m	MRAG and UBC (2008
New Zealand (illegal fishing)	2003-04	1000t of paua annually valued at $US60.35m	Fish Information and Services (FIS) cited in MRAG (2005a)
South Eastern Pacific			
Eastern Central Pacific	Average 2000-2003	129,772t – 278,450t valued at US$117m-251m	MRAG and UBC (2008)
Southeast Pacific	Average 2000-2003	1,197,547t – 2,567,890t valued at US$1,078m- 2,311m	MRAG and UBC (2008)
High Seas, Eastern Pacific (Unregulated fishing outside EEZs)	2003	40,000t of jumbo flying squid annually, valued at $US48m	FAO data cited in MRAG (2005a)
Ecuador (Illegal catch)	2004	300,000 specimens of sea cucumber valued at US$4.5m	FIS cited in MRAG (2005a)
Peru (Unregulated fishing outside EEZ)	2004	60,000t of fish valued at US$60m/year	FIS cited in MRAG (2005a)

While the data in Table 4 are neither comprehensive nor unequivocal, they serve to reinforce the view of APEC member economies that IUU fishing in the Asia-Pacific region is a significant and serious issue.

Few of the estimates in Table 4 relate to specific species. However it is clear that on a regional basis the level of IUU fishing for the following species is of serious concern:

- Sea urchin, Alaska Pollock, Salmon and king and blue crabs in the North Pacific
- Tunas and sharks in Southeast Asia and in the WCPO
- Jumbo flying squid in the high seas and sea cucumber in domestic waters in the South Eastern Pacific

Questionnaire responses provided some information on the level of IUU fishing activity in the fishing zones of APEC members. Only eight of the ten economy respondents provided data on the number of instances of illegal fishing by domestic operators, and only three provided data on unreported fishing by domestic operators. Those data highlighted the relative

magnitude of the different forms of IUU activity with instances of illegal fishing by domestic operators far outnumbering instances of other forms of IUU fishing. Only six respondents provided figures on instances of illegal fishing by foreign vessels in their EEZs and only one provided data on unreported fishing by foreign vessels in their EEZ. None of the respondents provided details of the nature and extent of unregulated fishing. Respondents did not generally provide estimates of the quantity and value of key species taken by IUU fishing. One member provided estimates of the quantity and value of domestic illegal activity in relation to key species and one member provided quantity estimates of the catch by foreign vessels within its EEZ by key species. Overall, the limited responses meant that it was not possible to build up a picture of the extent of IUU fishing across the region as a whole from the information provided by member economies.

None of the regional fishery bodies in the region routinely estimate the quantity and value of IUU catch of the species for which they were responsible. The WCPFC referred to an anecdotal estimate of IUU fishing in the WCPO of 10% of the reported catch, or 200,000t annually with an annual value likely to be around US$1b. The FFA, however, noted that the number of IUU vessels operating at any time is not known and expressed the view that previous estimates of IUU fishing in the region have not been accurate. Some regional fisheries bodies do maintain lists of IUU vessels and these provide some insights into the extent of the problem. The IATTC reported that it had 24 vessels (22 longliners and 2 purse seine vessels) on its IUU list; the NPAFC has 10 vessels listed (for use of large scale driftnets); and the WCPFC has three vessels listed.

4.2. Gaps in the data

The above discussion provides a broad overview of the nature and level of IUU fishing in the Asia-Pacific region. However the picture it paints is incomplete and subject to many qualifications. Much of the data is anecdotal, the basis for many of the estimates of the quantity and value of the catch taken by IUU fishing is unclear, the time frames to which these estimates relate vary, and assessments of the issue are largely related to specific subregions or species. Under these circumstances it is not possible to provide any meaningful estimate of the level of IUU fishing across the Asia-Pacific region.

The understanding of the nature and level of IUU fishing occurring within waters under the jurisdiction of economies in the region varies considerably. The absence, or lack, of effective surveillance means that much IUU fishing goes undetected. Based on questionnaire responses some economies have a good understanding of the nature, level and drivers of illegal and unreported fishing by domestic operators. However, member economies did not demonstrate, through their responses to questionnaires, a strong understanding of the overall level of IUU activity by foreign vessels in their EEZs. Of particular note was the lack of information on the quantity of IUU catch on a species basis. Not surprisingly, questionnaire responses indicate an even lower level of understanding of the nature and extent of IUU fishing on the high seas.

Individual economies are generally lacking:

- a methodology for estimating the level of IUU catch or target of bycatch species by foreign vessels in waters under their jurisdiction
    - there is a general lack of consistent database information on violations and prosecutions
    - there is little information on the number of vessel inspections, the temporal and spatial coverage of surveillance activity or the frequency of that activity
    - there is no basis on which to assess the duration of fishing or catch rates of IUU vessels
    - there are few observer programmes in place and many of those that are operational have limited spatial, temporal and fleet coverage, may not in any

case record all the necessary information, and data recording may be inconsistent; and

- sufficiently rigorous trade recording and monitoring processes that might be used to estimate and monitor trends in IUU catch of commercially important species.

These deficiencies are obvious in both well-resourced and under-resourced economies. Even where substantial investment has been made in combating IUU fishing, it is rare that methodologies to quantify the extent of IUU caught product and to estimate the species composition of the catch have been developed.

The extent to which the location, fishing method and catch of the vessels of Asia-Pacific economies that operate on the high seas is monitored varies across the economies. In addition, the monitoring and reporting arrangements of the relevant RFMOs in the region in relation to high seas operations vary. The RFMOs in the region hold relatively little information on the nature and extent of IUU fishing in waters in their convention areas, although most identify IUU fishing as a priority and are considering the introduction of a range of measures to address it.

While the very nature of IUU fishing means that it will be difficult if not impossible to determine precisely the level of IUU fishing, it is important that economies and RFMOs are aware of the relative economic, social and environmental risks posed by the various forms of IUU fishing that may be occurring in waters under their jurisdiction and of the drivers of that activity. Such an understanding will facilitate the development of appropriate and effective measures to deter and minimise IUU fishing and to allow for prioritisation of mitigation efforts.

5. THE IMPACTS OF IUU FISHING IN THE ASIA-PACIFIC REGION

5.1. Nature of impacts

IUU fishing is important because it has significant economic, social and environmental impacts. A workshop of APFIC member countries in 2007 concluded that overcapacity and IUU fishing threaten economic development and food security; and that pro-active tackling of these issues delivers concrete benefits throughout the sector and the economy at large (APFIC, 2007). Examples of the types of impacts included in each group are provided in Table 5.

The impact of IUU fishing on Asia-Pacific economies is both direct and indirect, and short and long term. In an economic and social sense IUU fishing directly affects the incomes of industrial fishers. In addition, it compromises the livelihoods and nutritional status of subsistence fishers and other low income sectors of the populations of many economies in the region. It also affects, the capacity, of those economies that are heavily dependent on fishing as a source of economic activity and of foreign exchange, to maximise their development potential and to alleviate poverty and disadvantage in large sections of their populations. These impacts may be exacerbated when marine resources are already overfished, as is the case for many species in the Asia-Pacific region.

The extent of the economic, social and environmental consequences of IUU fishing for economies in the region will vary, depending on factors including:

- the contribution of the fish harvesting and processing sectors to the gross domestic product (GDP) of these economies;
- the proportion of the population employed in fish harvesting, fish processing and marine-based ecotourism;

- the contribution of exports of fish products to foreign exchange earnings;
- the proportion of the population reliant upon harvesting of fish for subsistence purposes;
- the availability of alternative employment opportunities for people displaced from fish harvesting and processing activities; and
- the sensitivity of the marine environment to IUU fishing activity.

Further, the form of IUU fishing, in particular whether the activity is conducted by domestic or foreign operators, will have an effect on the nature and extent of the short-term economic and social impacts. In the short term if IUU fishing activity is conducted by domestic operators the employment and income generated by that activity is likely to be retained largely within the economy. However, where IUU-caught product is removed by foreign or local operators, the economy from which the product was extracted suffers both the short-term economic and social losses as well as the potential long-term impact on its fisheries resource.

The economic, social and environmental impacts of IUU fishing are discussed below.

Table 5: Examples of the economic, social and environmental impacts of IUU fishing

Economic impacts	Social impacts	Environmental impacts
• loss of revenue from the direct sale of fish taken illegally • loss of revenue from post-harvest activities (transport, processing, packaging etc) involving such catch • loss of export income • loss of revenue arising from access fees which do not reflect the true level of catch • depletion and potential loss of the resource upon which the local fishing industry relies • potential loss of revenue arising from provision of port services as a result of depleted resources arising from IUU fishing • significant contraction of local industry given smaller potential long term harvest • loss of wealth for the country as a whole • potential loss of tourism opportunities associated with impacts of IUU fishing on environmental amenity, for example, in marine protected areas • greater reliance on long-term foreign aid	• loss of employment opportunities associated with catch and post-harvest activities • potential social dislocation arising from overexploitation of stocks relied upon by coastal communities • nutritional impacts arising from overexploitation of stocks relied upon by coastal communities for subsistence purposes • human safety concerns associated with involvement in IUU fishing operations • further reductions in total available employment opportunities as fisheries become depleted	• loss and depletion of target stocks and broader impacts on habitats and ecosystems arising from: o overfishing o use of illegal fishing methods such as dynamite fishing or driftnets o use of methods that have a significant impact on the benthic habitat o lack of adherence to management measures, including bycatch mitigation measures, by IUU fishers o impacts on protected or endangered species

5.1.1. Economic impacts

In 2006, a total of 51m tonnes of fish were reported to the FAO as having been harvested in the Pacific Ocean. More than 99% of this catch was taken by economies in the region and 10 economies (China, Peru, Chile, Japan, Indonesia, the USA, the Philippines, the Russian Federation, Viet Nam and Thailand) accounted for more than 85% of that catch (see Table A3.1, Annex 3). Pacific Ocean catch comprises more than 99% of the global catch of five of those 10 economies and between 65 and 78% of the global catch of the other five. The long term sustainability of the marine resources of the Pacific Ocean is clearly paramount for these economies. Data available on the value of IUU catch taken in the region (see Table 4 above) suggest that the regional economic impact and the impact on some economies is significant.

However, there is a huge range in both the total GDP and the economic contribution of fisheries to GDP in economies across the region. In the more diversified and industrialised economies in the region, fisheries comprise a relatively small proportion of GDP. Despite this, in some of these economies the fisheries sector remains economically, socially and politically influential particularly in some regional, coastal communities. In 2006, GDP across the region ranged from just US$15m in Tuvalu to US$13,201,819m in the USA (The World Bank Group, 2008), reflecting the variability in the level of industrialisation and degree of diversity in these economies. This variability is also highlighted by questionnaire responses. Nine out of the 10 APEC members that responded to the questionnaire provided information on the value of fisheries production in member economies (see table 6).

Table 6: Value of fisheries production ($USm)

	2003	2004	2005	2006
Australia[1]	967	1068	1121	1066
Canada[1]	1625	1769	1741	1635
China	8900	10100	10700	11800
Hong Kong, China	196	1999	202	204
Malaysia	1220	1290	1220	1500
New Zealand	952	1002	995	1064.9
Singapore	3.4	3.7	2.6	6.8
Chinese Taipei	2025	2208	1898	1756
The USA[1]	3424	3723	3996	4066

1. May include catch outside the Asia-Pacific region.

There is no consistent source of data on the contribution of fisheries to GDP. Even the total value of fisheries production is ambiguous for a number of countries in the Asia-Pacific region. This can result from factors including:

- the total value of production for many countries in the region, may include catch taken outside the Asia-Pacific region (both within their own EEZs and on the high seas);
- calculations may or may not include the value associated with catch for subsistence purposes;
- calculations based on the value of fish catch underestimate the contribution of fisheries to economies where production of processed fish products, manufactured from domestic or imported product, is significant;
- calculations can include or exclude the value of access fees paid by foreign fishing fleets. For example, Lungren *et al.* (2006) estimate that fisheries contributes up to 36%

of GDP in Kiribati, 25% in the Marshall Islands and 19% in Vanuatu. In comparison, AusAID (2007) using work by Gillett and Lightfoot (2001) estimated that, taking into account access fees, the respective contribution of fisheries to GDP in Kiribati was 64%.

Economies in the Asia-Pacific region are major traders in seafood products. In 2006, six of the top 10 global exporters of seafood, by value, were economies located in the region (China, Thailand, the USA, Canada, Chile and Viet Nam). Similarly, four of the top 10 importers (Japan, USA, China and Korea) were Asia-Pacific economies. Many Asia-Pacific economies, such as China, Thailand, Chile, Viet Nam, Indonesia, Peru, Ecuador, Marshall Islands and Solomon Islands, are net exporters of seafood in value terms (see Table 7). This seafood trade surplus provides an important source of foreign exchange earnings in some economies. In this respect it is important to note that some countries in the region are among the world's most important processors of fish products. Maintenance of viable fish processing industries in countries such as China, Thailand and Viet Nam, and the employment, income and foreign exchange they generate, will require maintenance of supplies of seafood from sustainable fisheries.

The complexities of the economic impacts of IUU fishing are demonstrated by the Krause (2008) case study. That study identified a range of economic impacts, that are likely to apply to IUU fishing more broadly, including:

- impacts on the livelihoods of legitimate suppliers of sea urchin through the downward pressure on price caused by the presence of IUU-caught product in the market place;
- impacts on the long term economic viability of the legitimate sea urchin fishery through a reduction in the capacity of the industry to fund research and stock surveys owing to the decline in market returns; and
- tax losses to the domestic economy as a result of undeclared income arising from IUU catch of sea urchins and, presumably, tax losses on incomes generated by legitimate fishers, particularly those in other catching countries, given that the incomes of these fishers have been negatively affected by IUU catch.

The case study of IUU fishing on the east coast of Peninsular Malaysia reinforces these findings. It highlights the breadth of economic impacts of IUU fishing, indentifying revenue losses to the Malaysian economy including losses arising from depleted resources, non-payment of landing fees, licence fees, taxes and other related levies and loss of income and employment in industries purchasing seafood and supplying inputs to the fishing industry (Sea Resources Management, 2008).

The data made available for this study was inadequate for the purposes of providing a region wide estimate of the economic impact of IUU fishing. The most recent and comprehensive estimate of the direct economic value of fish taken by IUU fishing is that made by MRAG and UBC (2008) which puts the annual value of illegal and unregulated catch (excluding discards and unreported legal catches) at between US$3102m and US$7312m in 2000-2003, with the value of IUU fishing at that time considered highest in the Northwest Pacific and the Southeast Pacific. This must be considered as a minimum estimate of the total economic impact of IUU fishing in the region since it relates to only one of the economic impacts identified in Table 5.

Table 7: Seafood trade by Asia-Pacific economies, 2006[1]

Exports		Imports	
Economy	**US$m**	**Economy**	**US$m**
China	9150.3	Japan	14258.7
Thailand	5244.9	The USA	13399.7
The USA	4190.1	China	4188.5
Canada	3682.8	Korea	2767.9
Chile	3638.9	Hong Kong, China	2058.1
Viet Nam	3363.4	Canada	1842.1
Russian Federation	2129.3	Thailand	1573.1
Indonesia	2019.8	The Russian Federation	1447.2
Peru	1773.2	Australia	933.3
Japan	1456.6	Singapore	757.1
Chinese Taipei	1442.4	Malaysia	580.3
Ecuador	1337.9	Chinese Taipei	579.5
Korea	1049.2	Mexico	447.3
Australia	939.9	Viet Nam	280.8
New Zealand	875.9	Chile	176.4
Mexico	736.4	Colombia	144.7
Malaysia	624.0	Indonesia	142.7
The Philippines	418.4	New Zealand	106.2
Singapore	396.4	Philippines	103.0
Colombia	165.4	Korea, Dem. People's Rep	52.8
Panama	381.9	Costa Rica	39.9
Papua New Guinea	117.1	El Salvador	36.8
Costa Rica	106.0	Fiji Islands	35.1
Nicaragua	89.2	Peru	30.4
Honduras	86.5	Brunei Darussalam	25.6
Vanuatu	72.1	Panama	21.2
Korea, Dem. People's Rep	69.8	Guatemala	20.6
El Salvador	69.8	Honduras	19.6
Fiji Islands	62.4	French Polynesia	19.2
Hong Kong, China	51.1	Papua New Guinea	17.9
Cambodia	44.0	Ecuador	17.3
New Caledonia	34.0	New Caledonia	13.2
Solomon Islands	25.7	Cambodia	6.9
Marshall Islands	18.0	Nicaragua	5.0
Guatemala	14.2	Samoa	4.9
French Polynesia	10.9	Micronesia, Fed. States of	1.9
Samoa	7.2	Vanuatu	1.4
Micronesia, Fed. States of	6.8	Tonga	1.2
Brunei Darussalam	5.3	Solomon Islands	1.2
Kiribati	5.0	Cook Islands	0.9
Tonga	4.8	Kiribati	0.8
Cook Islands	4.3	Palau	0.7
Palau	0.7	Marshall Islands	0.5
Tuvalu	0.3	Tuvalu	0.0

1. Seafood trade values include both wild-caught marine and aquaculture products.
Source: FAO, 2008b

An additional, but often unrecognised economic cost of IUU fishing is the financial investment required to combat it. Many economies in the region have devoted considerable financial resources to address IUU fishing in their waters. Few questionnaire respondents were able to identify expenditure devoted to combating illegal foreign fishing in their waters, however Australia indicated that it has allocated $603.8m towards deterring and combating illegal foreign fishing in northern Australian waters since 2004, with considerable success. However, for those economies in the region with limited financial capacity such an investment may be beyond their means.

5.1.2. Social impacts

Fishing is a significant source of employment in many Asia-Pacific economies where alternative employment opportunities and the opportunity to acquire new skills or training are also often limited. The FAO estimates that in 2004 there were 8.5m people employed as fishers in China, nearly 4m in Indonesia, around 230,000 in Japan and some 95,000 in Peru (FAO, 2007b). In 2006, Chinese Taipei estimated that of the 129,000 households involved in fishing, some 63%, or 81,000, were involved in coastal or offshore fishing (Government Information Office, Republic of China, 2008). In countries such as China and Indonesia the trend in numbers employed as fishers is upwards, however, in countries such as Japan, the number of fishers more than halved between 1970 and 2004 (FAO, 2007b).

In many cases individual fishers are drawn into IUU fishing activities through the need to generate an income and the absence of alternative income opportunities. High unemployment levels render workers vulnerable to IUU fishing operations. For example, the recruitment of villagers as crew on IUU fishing vessels has been facilitated by high levels of unemployment in the Philippines. These workers are often paid low wages, required to work long hours with little regard for safety and provided with substandard food and accommodation (Bernardi, 2006).

Other social impacts that result from IUU fishing include impacts on the economic and social engagement of women who play a key role in the auctioning, processing and retail selling of fish in some communities (see for example, Sea Resources Management, 2008).

Poor safety standards are a common problem in IUU fishing operations. This is highlighted in the Krause (2008) case study of the impacts of the IUU Sea Urchin Fishery which noted the lack of government oversight of safety practices and the resulting serious injuries and deaths reported as a result of disregard for diver safety limits in the Kurile Islands sea urchin fishery. Sea Resources Management (2008) reports that accidents occur frequently during fishing operations on IUU vessels operating off the east coast of Peninsular Malaysia because of poor safety standards.

More broadly, IUU fishing operations regularly do not comply with the international labour standards adopted by the International Labour Organization in June 2007[13]. In such cases crews on IUU vessels are forced to endure unacceptable living and working conditions.

Similarly, illegal shark fishing in northern Australian waters, predominantly by Indonesian-based fishers, is increasingly organised and/or financed by wholesale fish traders or moneylenders. In these cases, fishers and crew are often drawn into a cycle of indebtedness which precludes them from exiting IUU fishing activities (see Box 2). The indebtedness creates an ongoing need for these fishers to return to sea to continue their IUU operations even after detection, apprehension and repatriation from Australia. This perpetuates poverty and social inequity.

[13] Available at: http://www.ilo.org/public/english/dialogue/sector/sectors/mariti/fishing.htm

Box 2 A cycle of indebtedness: An example from Indonesia

"The wider growth of Asian demand and the opening of China as a seemingly unlimited market for shark fin were accompanied by significant increases in world prices during the late 1980s and early 1990s. A number of new developments occurred in the shark fin trade in Indonesia as a consequence. … In 1989 the first of a number of wholesalers established a permanent direct trade in marine products in Pepela. ….He was followed by a trader from Ujung Pandang operating out of Kupang, who placed his own buyers in Pepela. The large-scale traders provided capital to their buyers in Pepela, who in turn supplied provisions and fishing materials for shark fishing trips, as well as cash to the fishermen on credit. The fishermen were then obliged to sell their shark fin catch to that buyer at the price offered and also to pay off the cost of provisioning. This was the commencement of the cycle of Bajo local indebtedness in Pepela. One of the traders also began to acquire his own fleet of *perahu lambo* which he loaned to fishermen in order to undertake shark fishing voyages." (Stacey, 2007).

While this project does not address aquaculture issues directly, the growth of aquaculture in many Asian-Pacific economies in the last decade has resulted in increased employment opportunities. Much of this aquaculture relies heavily on the catch of wild-caught fish for farm fish food (trash fish). The aquaculture sector, including those employed by it, has a vested interest in ensuring that marine fish stocks are sustainable, but at present, in Southeast Asia in particular, there appears to be an insatiable demand for fish for feed and little regard for ongoing sustainability of fish stocks let alone the negative impact on the broader environment.

In addition to direct employment in fishing, many indirect employment opportunities are created in fish processing and transport sectors and in the supply, repair and maintenance of vessels and fishing gear. The extent of this indirect employment will be influenced by factors including the amount of processing, of either domestic or imported catch, conducted in the economy, and the extent to which demand for inputs is satisfied by domestic suppliers. In the main, statistics are not available to determine the total direct and indirect employment generated by the fishing industry.

Fish is a rich source of micronutrients, minerals, essential fatty acids and proteins. The fishing sector makes a significant contribution to the food supply and to nutritional requirements of many less industrialised economies in the region. For example, the FAO estimates that fish contributes to, or exceeds 50% of total animal protein intake in Indonesia and, that in Oceania and Asia as a whole, fish represents around 8% and 10% of the total protein supply respectively (FAO 2007b). This contribution primarily takes the form of direct catch and consumption of fish in subsistence communities. But the sale of fish also provides much needed income for the purpose of purchasing other forms of food. In some circumstances, this reflects the relative value of fish and other food products where the higher value of fish justifies its sale for the purchase of lower value alternatives. Sea Resources Management (2008) reports that IUU fishing activities in east coast Peninsular Malaysia have contributed to an increase in fish prices, which makes fish less attainable by the fisheries community including the poor who make up a high percentage of coastal village dwellers in the region. In addition, the failure of IUU fishers to adhere to basic food hygiene standards poses a risk to human health from consumption of IUU-caught product (Sea Resources Management, 2008).

5.1.3. Environmental impacts

The environmental consequences of IUU fishing range from the destructive impact of fishing on habitats, including sensitive habitats such as coral reefs, to the depletion of marine resources (both target and bycatch species) and the impact of unsustainable fishing on the functioning of ecosystems. Ultimately, environmental degradation arising from IUU fishing, and overfishing more generally, is reflected in economic and social impacts arising from reduced fishing opportunities and consequent reductions in the contribution of fisheries to income, employment and nutrition. In addition, the degradation of marine environments may

reduce ecotourism opportunities. The negative ecological impacts of IUU fishing are summarised in Table 8.

Pitcher *et al*. (2006) found, that in a number of Asia-Pacific economies, IUU fishing affects the accuracy of stock assessment and the setting of catch limits for some species. The impact of IUU fishing on target stocks is amplified in cases where those stocks are already outside safe biological limits. Under such circumstances failure to include meaningful estimates of IUU catch into stock assessment and to reflect the impact of that fishing in catch limits of legitimate fishers places stocks at increased risk.

Table 8: Possible negative ecological impacts of IUU fishing

ECOSYSTEM COMPONENT	Nature of IUU fishing	Impacts
Target species	IUU fishing outside quota in EEZ waters. IUU fishing in high seas waters Under-reporting of catch Unmonitored discarding of juveniles Discarding or loss of fishing gear	Compromises stock status by exceeding catch limits and/or by limiting the accuracy of stock assessment models. Can compromise normal ecosystem functioning
Bycatch species	Unrecorded mortalities of bycatch species Unrecorded mortalities of endangered species of turtles, seabirds, sharks etc. Failure to adopt bycatch mitigation measures Discarding or loss of fishing gear	Increased and unknown levels of fishing pressure on stocks of bycatch species in general and endangered species n particular. Can compromise normal ecosystem functioning.
Habitats	Destruction of habitats by IUU vessels Uncontrolled dumping of rubbish and fishing gear	Compromises normal ecosystem functioning. Can reduce opportunities for non-fishing uses of marine habitats, such as eco-tourism

Source: Based on MRAG (2005b).

The Krause (2008) case study of the impacts of the IUU sea urchin fishery examined the direct environmental impact of IUU fishing on the target species and highlighted the difficulty of examining the impact of IUU fishing on the target species in isolation from other fishing activities. The study notes:

> "IUU fishing operations targeting various species of crab, sea cucumbers, fish and other living marine resources in addition to sea urchins have grown very quickly with no oversight from regulators. Projecting the impact of the sea urchin IUU fishing on the stock condition in isolation under these circumstances, even in the limited area under consideration, is virtually impossible. As an example of how these interact, many of the predators affecting the juvenile urchins are removed during this and other fishing operations and survival of the juveniles is likely much higher than normal."

However, the study concludes that sea urchin harvests in the British Columbia fishery have been reduced as a result of the IUU fishery.

The media reports in Annex 4 indicate that a considerable proportion of the reported instances of IUU fishing involved fishing in marine reserves, using gear that has been prohibited in order to minimise impacts on juveniles of the target species or on bycatch species, and taking protected species. The potential impact of IUU fishing on endangered or vulnerable species of seabirds, turtles and sharks is of particular concern.

Much of the literature of the impact of IUU fishing on habitats and ecosystems relates to the impact of destructive fishing practices such as use of poisons and blast fishing (see for example, Burke *et al.*, 2002 and Bailey, 2007). These practices have the potential to cause irreversible damage to sensitive marine habitats such as coral reefs. While this form of fishing is usually carried out by domestic operators in coastal reef areas, and is not, therefore, a focus of this report, the potential environmental and longer term economic and social consequences of these practices are significant. For example, the Philippines' draft NPOA-IUU Fishing notes that significant economic losses are incurred through illegal trade in corals and in lost fishing production due to coral destruction by illegal fishing and the illegal trade in endangered and protected species such as marine turtles (Palma, 2006).

In addition, the use of other fishing methods such as trawling has been identified as having significant environmental and social consequences in some areas. For example, the JALA/EJF (2007) has identified that illegal trawling by domestic vessels in North Sumatra has had a dramatic impact on the access of traditional fishers to catch, has resulted in sometimes deadly conflicts between the traditional and industrial fishers and is having negative impact on benthic habitats and local fish breeding and feeding grounds. Further, Burke *et al*. (2002) have suggested that illegal fishing by foreign vessels is thought to be a factor in the decline of Cambodia's coral reefs.

While it is not possible to quantify the environmental impacts of IUU fishing it seems clear that IUU fishing is contributing to overfishing, to the destruction of sensitive marine ecosystems and imposing additional pressure on already vulnerable marine species and ecosystems in the Asia-Pacific region.

Destructive fishing

The commercial use of poisons to capture live reef fish began in the Philippines in the 1960s and spread to Indonesia, Viet Nam and parts of Malaysia. It typically involves the use of sodium cyanide which stuns fish and makes them easier to capture, but also damages or kills other fish and affects corals. Poison fishing is illegal in most economies in Southeast Asia but, nevertheless, remains a widespread problem in Indonesia and Viet Nam.

Blast fishing is outlawed throughout Southeast Asia but remains common. Its effects can be devastating for both coral reefs and people.

The Reefs at Risk in Southeast Asia project estimates that 56% of the coral reefs of Southeast Asia are at risk from destructive fishing practices. The threat is particularly high in the Spratly and Paracel Islands and in Viet Nam. Over two thirds of reefs in the Philippines, Malaysia and Chinese Taipei and 50% of the reefs in Indonesia are threatened by destructive fishing.
Source: Burke *et al.* (2002)

6. ADDRESSING IUU FISHING

6.1. Best practice approaches to IUU fishing

There are a wide range of different approaches which may be considered "best practice" when it comes to tackling IUU fishing, but as a general comment these all start with developing and implementing sound fisheries management domestically (including appropriate MCS arrangements). The same principles which are developed and used domestically then need to be applied sub-regionally and regionally. However there exists a wide range of views of what "sound natural resource management" is, both within individual economies, between neighbouring countries across the Asia-Pacific region more generally. There also exist vastly differing pressures on the use of available marine resources. In a developed economy this might mean resources can be carefully managed and conservatively harvested while not impacting on a major proportion of the population.

By contrast the immediate need for food in a developing country may dramatically increase the pressure on marine resources and the incentive to access the resource regardless of the management arrangements in place.

However, a carefully managed renewable natural resource such as fisheries can provide a stream of food, income and wealth over time. By contrast if it is not managed, or managed poorly, the potential output will be significantly reduced and this will impose significant longer term costs. The principle applies equally to marine resources within EEZs and on the high seas.

There are numerous examples of both the costs and benefits of good management and also just how long it can take to repair damage caused by little or no management[14]. Best practice approaches rely on:

- participation by all those who have some involvement with the resource - As a minimum coastal and flag States but increasingly should also include port and market States.
- ratifying and implementing all relevant treaties and agreements - as a minimum in respect of high seas fishing, UNCLOS, UNFSA and the Compliance Agreement as well as the development and implementation of a NPOA – IUU;
- a common understanding and commitment to the management and conservation objectives of the stock or the objectives of a particular RFMO;
- a willingness to look beyond national interest in respect of access to and use of the resource; and
- a willingness to take a long term view of the benefits and costs associated with sound management.

Best practice approaches involve a full range of tools which are tailored to the particular need of the individual country, the fisheries resources it has available, the region within which it is located and the approach adopted by neighbouring countries. In addition to those outlined above this will involve implementing all the key requirements of a model coastal, flag, port and market State. The desirable characteristics or undertakings for coastal, flag, port and market States are summarised below:

Coastal States

- have defined and agreed maritime boundaries and have established a 200nm EEZ;
- have well established and adequately resourced domestic fisheries management arrangements, supported by sound legislation and properly enforced;
- have a good understanding of the resources within its EEZ;
- have assessed these resources and be harvesting them sustainably or allowing other States access to harvest any excess sustainably;
- have ratified UNCLOS, UNFSA and agreed to the Compliance Agreement;

[14] Namibia is often cited as an example of how building and resourcing sound management arrangements can provide a major deterrent to IUU fishing and substantially improve returns from fisheries resources over time. By contrast the difficulties and costs faced by the EC in managing the common resources of member countries has lead to substantially reduced output and significant stock rebuilding programs but in many cases the underlying drivers for the problems have not been addressed.

- in regard to highly migratory or straddling stocks, cooperate directly with other coastal or fishing States or through appropriate subregional or regional bodies to ensure the conservation and management of these stocks and ensure compatibility of management arrangements between differing jurisdictions; and
- if no RFMO exists to manage a highly migratory or straddling stock/fishery cooperate with others to establish an organisation and develop conservation and management measures.

Flag States

Participation in global fisheries agreements

- have ratified UNCLOS;
- have ratified the UNFSA;
- have accepted and implemented the FAO Compliance Agreement; and
- have ratified all appropriate maritime safety agreements.

Participation in regional fisheries agreements and organisations

- be a member of relevant RFMOs or participating as a cooperating non-member; and
- comply with all RFMO conservation and management measures.

Domestic implementation and regulation

- adopt and implement a NPOA – IUU;
- maintain a national record of fishing vessels and make it available to the FAO and RFMOs;
- implement standardised markings of fishing vessels; and
- implement regulations for fishing on the high seas, including a prohibition on fishing on the high seas without authorization.

Port States

- maintain an effective system of port State control for foreign fishing vessels so as to promote the effectiveness of domestic and high seas conservation and management measures;
- designate ports to which foreign fishing vessels are permitted to access and ensure these ports have the capacity to conduct port inspections;
- require prior approval to access EEZ and port;
- not allow a vessel to use its ports for landing, transshipment or processing fish if the vessel flag State is not a member of a relevant RFMO or has been engaged in or supporting IUU fishing activity in the area of an RFMO or in water of a relevant coastal State, unless the vessel can establish the fish were taken legally;
- where it is believed a vessel has engaged in or supported IUU fishing beyond it fisheries jurisdiction refuse to allow the vessel to use its port for landing, transshipment, refuelling or resupply;
- not allow a vessel to use its ports for landing or transshipment where it has been established that the vessel is identified by an RFMO as engaging in or supporting fishing activities in contravention of management and conservation measures;

- conduct port State inspections and obtain appropriate information;
- monitor and report to the appropriate flag State, RFMO or other body as necessary on any catch or trade scheme paperwork which is accompanying fish;
- consult, cooperate and exchange information with other States and organisations as necessary; and
- participate (as appropriate) in RFMOs and regional fisheries arrangements even if not actively involved in the fishery.

Market States

- monitor and report to the appropriate flag State, RFMO or other body as necessary on any catch or trade scheme paperwork which is accompanying fish;
- implement agreed trade or market related measure to prevent the importation of product which has been identified as being caught by IUU vessels;
- develop and implement trade codes to enable species specific monitoring of trade and comparative analysis of catch and trade;
- implement Lacey Act style legislation[15] domestically which makes it illegal to trade in illegally harvested product whatever its origin; and
- participate in and cooperate with (as appropriate) RFMOs and regional fisheries arrangements even if not actively involved in the fishery.

The information available for this study was insufficient to allow for an assessment of the performance of APEC economies against these best practice indicators.

6.2. Responses to IUU fishing in the Asia-Pacific region

6.2.1. Participation in international instruments

As a sign of commitment to the international community's desire to conserve and manage fish stocks and the ecosystem which supports them, there can be no doubt that ratifying and implementing key international instruments is an important and vital first step. However despite the plethora of instruments which are now in place and the efforts of organisations and those countries who are strong advocates to ensure their successful operation, there are extensive gaps in membership of these instruments. Possibly of greater concern is the fact that many countries have ratified these instruments without consideration of the ongoing resources required to meet their obligations under them.

If all the existing international rules worked effectively and all countries signed up to these rules and implemented them in good faith, IUU fishing on the high seas would be far less of a problem than it is now. The reality is substantially different and despite the existence of a strong legal framework based on UNCLOS there exist serious concerns about its ability to minimise IUU fishing and deliver effective conservation and management of stocks.

[15] The Lacey Act is a U.S. statute that is aimed directly at illicit trade in illegally caught fish and wildlife. The Act makes it unlawful for any person subject to the jurisdiction of the United States to "import, export, transport, sell, receive, acquire, or purchase … any fish or wildlife taken, possessed, transported or sold in violation of any law or regulation of any State or in violation of any foreign law." Both criminal and civil sanctions are available under the Act, as well as forfeiture of the illegally caught fish. United States prosecutors have used the Lacey Act's provisions extensively to deal with importations of illegally caught fish (HSTF, (2006). Further information in the documents section of the following link: http://www.high-seas.org/

Based on a range of discussions in international fora including an increasing number of UN General Assembly resolutions on sustainable fisheries, the St John's Declaration (Anon, 2005) and the BPA, the HSTF identified the key high seas governance related problems as:

- failure by some States to participate in existing multilateral instruments as a critical constraint to effective implementation and enforcement of these arrangements;
- inadequate implementation of existing instruments at the regional level, including lack of effective institutional arrangements, conservation and management measures that do not meet the standards set by the existing legal framework, lack of coordination between regional bodies and inadequate harmonization of measures;
- inadequate flag State control over fishing vessels;
- the existence of geographical and structural gaps in the system of high seas governance; and
- subsidies and other perverse signals that displace rather than eliminate unsustainable fishing.

Membership of Asia-Pacific RFMOs and ratification of key international instruments is provided in Annex 6.

Table 9 provides a summary of this information for APEC economies in respect to UNCLOS, UNFSA, the FAO Compliance Agreement and individual country National Plans of Action for IUU fishing. This table shows the wide variation in the participation by APEC member economies in what are the fundamental and critically important instruments for managing high seas fish stocks and deterring IUU fishing. Four of the 21 APEC economies have not ratified UNCLOS and 13 have not ratified the UNFSA (this includes Chinese Taipei, the diplomatic status of which precludes it from ratifying such agreements). Eleven APEC economies (including Chinese Taipei) have not deposited instruments of acceptance for the FAO Compliance Agreement and only six economies have developed and implemented an NPOA-IUU fishing.

As discussed previously, the UNFSA does not seek to impose additional requirements on countries; it is an agreement for the purpose of implementing the provisions of UNCLOS. While becoming a party to an international agreement is no guarantee that it will be effectively implemented, not being a party may indicate that the country in question does not feel it can adequately implement the provisions of the instrument or, worse, may demonstrate a clear lack of recognition of the problem or commitment to solving it. Table 9 provides information on ratification, acceptance and development of key international instruments with respect to IUU fishing and reveals a vast difference in APEC members' commitment to these key instruments.

Within this broad framework, RFMOs play a critical role in developing and implementing conservation and management measures for straddling and highly migratory fish stocks. The UNFSA highlighted and further developed the concept and need for regionally based management arrangements established either on a bilateral or multilateral basis. RFMOs provide the framework for this to happen where multiple States are involved as coastal and fishing States and more recently as port and market States. The continuing decline of fish stocks worldwide has demonstrated the need to engage all possible States to ensure conservation and management measures are implemented and not circumvented.

Table 9: Ratification/accession/acceptance of key instruments by APEC member economies

Economy	UNCLOS	UNFSA	Compliance Agreement	NPOA – IUU Fishing
Australia	Yes	Yes	Yes	Yes
Brunei Darussalam	Yes	No	No	No (in development)
Canada	Yes	Yes	Yes	Yes
Chile	Yes	No	Yes	Yes
China	Yes	No	No	No
Hong Kong, China	Yes	No	No	No
Indonesia	Yes	No	No	No
Japan	Yes	Yes	Yes	No
Korea	Yes	Yes	Yes	Yes
Malaysia	Yes	No	No	No (Draft)
Mexico	Yes	No	Yes	No
New Zealand	Yes	Yes	Yes	Yes
Papua New Guinea	Yes	Yes	No	No
Peru	No	No	Yes	No
The Philippines	Yes	No	No	No (Draft)
The Russian Federation	Yes	Yes	No	No
Singapore	Yes	No	No	No
Chinese Taipei	-	-	-	-
Thailand	No	No	No	No
The USA	No	Yes	Yes	Yes
Viet Nam	Yes	No	No	No

Annex 6 provides more detail on membership and possible gaps in membership. A number of these bodies[16] are either region or species specific and as such are relevant to a relatively small number of participants. It is worth noting that membership or interest in the two most recent additions to the Pacific RFMOs, the WCPFC and the still to be established SPRFMO is broadly based with membership or participation covering many Asia-Pacific economies as well as fishing nations from other regions.

Membership however is very much only part of the equation and commitment and support for these bodies is equally important if we are to overcome the inadequate implementation of existing instruments at the regional level and improve institutional goals and arrangements. The combination of both will significantly improve conservation and management measures and bring them more into line with contemporary legal arrangements (the UNFSA in particular) and the international community's expectations in relation to conservation and sustainable use of marine resources.

[16] CCBSP, CCSBT, IPHC and NPAFC

A number of authors have noted that while most of Asia's maritime economies are signatories to important international treaties and agreements there are well documented implementation gaps which need to be addressed (see Box 3).

Box 3 The Implementation Gap

"Although most of Asia's maritime nations are signatures to international treaties and agreements such as UNCLOS and the Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries, making them legally responsible for implementing sustainable exploitation and management of fisheries resources, there is a well documented "implementation gap" between the obligations of countries in the region under the global treaties and initiatives, on the one hand, and their ability to implement national and local measures to satisfy those obligations on the other." (Heazle and Butcher, 2007)

6.2.2. Bali Plan of Action (BPA)

In 2005, as part of the BPA, APEC Ministers affirmed their commitment to:

> "…substantial and concrete steps to balance sustainable management of marine resources and the marine environment with economic growth "

and agreed to

> "…work domestically, regionally, and internationally, in the near to mid-term (2006-2009), towards:
>
> I. ensuring the sustainable management of the marine environment and its resources;
>
> II. providing for sustainable economic benefits from the oceans; and,
>
> III. enabling sustainable development of coastal communities." (APEC, 2005)

The BPA provides an ambitious program reflecting the importance of the marine environment and trade in marine products to all APEC regional economies. Some of the key commitments that are of direct relevant to this study are:

General fisheries management

1. Engage in fisheries management reform, where appropriate, including through RFMO reform, by advocating the application of an ecosystem approach to fisheries management, improving decision-making processes to reflect a precautionary approach, ensuring capacity does not exceed long-term resource sustainability, enhancing MCS programs, and establishing adequate sanctions to achieve deterrence
2. Identify mechanisms to better manage fishing capacity, such as through projects that facilitate the sharing of APEC economy experiences in fishing capacity reduction and adjustment, to help ensure a balance between such capacity and long-term resource sustainability
3. Build the capacity of APEC economies to conform to the FAO Strategy for Fisheries Status and Trends Report, and increase the number of APEC economies providing comprehensive data on fisheries to relevant RFMOs, including reporting on the impacts of fishing
4. Exchange research and information on ecosystems to ensure conservation and sustainable management

Understanding of impacts

5. Study the market and non-market value of the marine environment and marine industries in the Asia-Pacific region, including by undertaking research, communication and information exchange on marine activities
6. Improve understanding and management of the impacts of human activities, including fishing practices and aquaculture, on environmental health and productivity

Fisheries governance

7. Increase the number of APEC economies that ratify, or adhere to, UNCLOS, UNFSA, FAO Compliance Agreement, and effectively implement provisions domestically and in RFMOs in which they are a member
8. Reduce and eliminate corruption that undermines sustainable fisheries management and fair trade in fisheries products
9. Increase the number of APEC economies that are a party to, or a cooperating non-member of, all relevant RFMOs, and cooperate in establishing new RFMOs, where gaps exist
10. Increase the number of APEC economies that implement the FAO Code of Conduct for Responsible Fisheries, Strategy for Status and Trends, and International Plans of Action on Seabirds, Sharks, Fishing Capacity, and Illegal, Unreported and Unregulated (IUU) fishing

Addressing IUU fishing

11. Strengthen efforts to combat IUU fishing including by pursuing the use of at-sea, port-state and trade-related measures, in accordance with international law, as key compliance tools, through APEC capacity building and sharing of best practices, and strengthen efforts to collaborate through MCS regimes and the MCS Network

A stock-take of progress against these and other commitments was conducted in 2007. Sixteen of the 21 APEC economies responded to a range of questions on IUU fishing as part of the stock-take. Respondents identified the following actions taken to combat IUU fishing:

- strengthening the use of at-sea, port State and trade-related measures;
- efforts to collaborate through MCS regimes and MCS networks;
- APEC capacity building and sharing of best practice;
- developing an NPOA-IUU (six implemented, two being developed); and
- enhanced monitoring of IUU fishing by foreign fishing vessels (Pers. Comm. from Sea Resources Management to F. Meere, April 2008).

Some of the more specific policy, MCS and legislative measures adopted by these economies to address IUU fishing fall include:

Policy

- implementation of new domestic fisheries management arrangements, including registration and licensing systems, regulation of fishing efforts, implementation of observer programmes and dockside monitoring programmes and promoting right-based fisheries to replace open access regimes
- cooperation with neighbouring States to address IUU fishing
- participation in international and regional efforts to address IUU fishing

- certification of fish and fishery products for trade
- decommissioning of vessels engaged in IUU fishing

MCS

- provision of additional budget to increase enforcement capacity
- improvement in coordination and cooperation in operational activities to deter illegal fishing
- conduct of joint patrols with neighbouring States
- improvement of MCS systems, including involving local communities
- involvement in the International MCS Network
- implementation of port State control measures
- implementation of boarding and inspection schemes
- collection of fisheries information from local and foreign fishing vessels

Legislative

- introduction of amendments to legislation to include significant custodial penalties for foreign fishing offences
- authority to inspect, search, seize and arrest fishery violators
- application of rules to prevent nationals from engaging in IUU fishing

Responses to questions related to initiatives to enhance MCS programs and the adequacy of sanctions to deter IUU fishing indicated that there was positive engagement in enhancing MCS programs and that there was a wide range of actions being adopted. However, as the example in Box 4 shows, effective MCS initiatives can be rendered worthless unless there is commitment to addressing the issue at all levels. Developed economies tended to pursue apprehension, forfeiture and imprisonment as sanctions and deterrents whereas lesser developed economies reported a heavier reliance on financial penalties. While some countries reported reduced IUU activity it was unclear whether the IUU activity might have relocated rather than declined overall (Pers. Comm. from Sea Resources Management to F. Meere, April 2008).

Box 4 Obstacles to effectiveness of MCS

In the Philippines a low tech approach to MCS has been developed. Nearly 900 fishermen coordinate through text messages using mobile phones donated by Filipino sources, alerting the authorities when they observe illegal dynamite and trawl fishing. Unfortunately, local communities' efforts are hampered by a failure of the judicial system to withstand diplomatic pressure from foreign flag States involved in IUU fishing and most of the arrested fishers are not prosecuted. In the nine years to January 2007, 600 Chinese nationals were arrested for marine or terrestrial poaching in the Philippines but only one case – the December 2005 arrest of 17 poachers caught with 54 marine turtles led to a conviction, but even they were subsequently given a presidential pardon (Reeve, 2007).

6.2.3. Initiatives implemented by economies

Economies have responded in various ways to IUU fishing. These responses reflect the drivers of IUU fishing, but more commonly have taken the form of measures to respond to rather than to address the incentives for IUU fishing. In many cases, the response has included the dedication of increased financial and human resources to deterring, detecting,

apprehending and prosecuting IUU fishers and also the development of a more coordinated, interagency response to IUU fishing.

In Australia, additional funding of some A$214m in 2004 to counteract illegal fishing, was further supplemented in May 2006 with an increase to more than A$600m over three years for this program. The allocation included funding for the creation of an integrated, cross-agency control group (the Joint Offshore Protection Command), increased logistical intelligence support for detecting and apprehending illegal foreign fishers, and for the processing, prosecution and detention of apprehended fishers. This commitment was largely in response to incursions by Indonesian vessels into Australia's northern waters but also provided continued surveillance and enforcement of illegal fishing activity in the Southern Ocean (Nelson *et al*., 2006). This significant level of funding has resulted in substantial reductions in sightings and apprehension of illegal foreign fishing vessels. Together with ongoing cooperation from other countries in surveillance and enforcement, trade measures and public information campaigns the expenditure has had a significant positive effect.

While such responses are a necessary component of the fight against IUU fishing, they are only one component and many countries in the region do not have the capacity to commit such substantial resources to counteract IUU fishing.

Other APEC economies reported responding with a range of differing new or enhanced policy initiatives, including:

- improved domestic management arrangements;
- the development of specific policies (NPOA – IUU);
- seeking to more closely match fishing capacity and sustainability;
- increased regulation of foreign fishing vessels including more restrictive port access arrangements;
- reductions in their high seas fleet;
- enhanced enforcement provisions[17];
- a range of cooperative initiatives with other countries and RFMOs including the enhancement of the International MCS Network; and
- developing alternative sources of income to reduce IUU fishing by nationals and community awareness programs explaining the effects of IUU fishing.

In relation to initiatives involving increased regulation of foreign fishing vessels, in particular more restrictive port access arrangements, the information from the FAO/APFIC/Southeast Asian Fisheries Development Centre (SEAFDEC) workshop on port State measures to combat IUU fishing (FAO 2008c) provides insight into some of the issues which will need to be addressed. These include:

- the lack of human capacity to implement the necessary measures;
- limitations with existing legal instruments;
- insufficient MCS capacity, in many cases lack of fisheries officers to undertake inspections; and

[17] For example, recent Media Reports (Anon, 2008c) indicate that, in a bid to get illegal fishing by foreign flagged vessels under control, the Maritime Affairs and Fishery Ministry in Indonesia is seeking authority to 'shoot and sink' poachers trying to flee or resist arrest.

- lack of coordination among national agencies.

It was noted that IUU fishing was not a new issue for Southeast Asia with problems stemming from IUU fishing due to failures in fisheries management at the domestic, subregional and regional levels. The report identifies three types of IUU fishing vessels in the region: those from neighbouring countries, those from foreign countries which operate in the region; and those operated in high seas areas covered by an RFMO. A suggested approach to address IUU fishing in the region is to strengthen domestic fisheries management arrangements and monitor more closely domestic vessels undertaking IUU fishing and those from neighbouring countries.

One of the significant drivers of IUU fishing identified earlier in this report is the lack of alternative employment opportunities available in the less industrialised and diversified economies in the region. Palma and Tsamenyi (2008) highlighted the lack of job opportunities or livelihoods among coastal residents on the Sulawesi Sea and the lack of alternative livelihoods for fishers as a key driver of IUU fishing. This applies to fishers whose livelihoods are threatened by overfishing and who resort to IUU fishing in response to that threat. In addition, it applies to those, often unskilled, workers displaced from other sectors, especially the rural sector, who take up IUU fishing as employment of ‘last resort'.

Where this situation exists there is an obvious need to increase the availability of, and access to, alternative, legitimate and sustainable employment opportunities. This may be done by supporting the development of new industries as Malaysia has done in establishing seaweed farming in coastal communities and/or the provision of training to increase the range of employment opportunities available to displaced workers. In assessing the scope for implementation of alternative livelihood programmes in coastal, fishing villages in Indonesia, Fox and Sen (2002) identified improvements in the levels of education and access to adequate and reliable credit as key factors in broadening the opportunities for employment outside the fishing sector. Such factors are relevant more broadly to development prospects in developing countries and tend to require a longer term to effect meaningful change. Teh and Sumaila (2006) also note that the development of alternative livelihoods may require investment in infrastructure (roads, electricity, sewerage). The investment in these longer-term projects is sometimes at odds with the immediate priorities and enthusiasm for demonstrable short to medium-term results that characterise some donor-funded projects.

Salayo *et al*. (2008) analyzed approaches to the management of fishing capacity in small scale (non-commercial) fisheries in Cambodia, Philippines and Thailand including effort reduction, gear/area/temporal restrictions and alternative livelihoods. In particular the study, examined the perceptions and acceptance of these measures by fishers. Of the three approaches examined, measures concerning effort/catch reduction were unacceptable to fishers, gear/area/temporal restrictions were acceptable and alternative and supplemental livelihoods were well accepted by fishers in all three countries: “There was an overwhelming consensus that alternative (providing more than 50% of income) and supplemental livelihoods are needed by the fishers to exit from the fisheries.

The literature commonly identifies aquaculture and marine-based tourism (see for example, Fox and Sen, 2002; Teh and Sumaila, 2006) as appropriate alternative livelihood options. A number of examples in the Asia-Pacific region where alternative livelihood schemes have been initiated in response to IUU fishing reflect that thinking:

- In response to incursions by Indonesian shark fishers into northern Australian waters, Australia has provided financial assistance to promote seaweed and coral-reef cultivation among fishing communities in Roti Ndao and Kupang Districts in East Nusatenggara Province in Indonesia (Anon., 2007a).

- Malaysia has identified the development of alternative income sources, such as seaweed farming, in coastal communities as a key component of its policy response to IUU fishing. For example, a key challenge of the Semporna Islands Darwin Project in Sabah, Malaysia, is tacking the legacy of many years of unregulated and destructive fishing practices by encouraging alternative livelihoods which take the pressure off reefs. The approach adopted has been to train local people to grow and market species such as giant clams and abalone for food, as "seed" stock and/or to replenish the reefs (Anon., 2008d). Elsewhere in Malaysia micro credit schemes have been introduced to reduce dependence of villagers on fishing and to encourage them to go into alternative income producing activities (Mohd Nazlan Annuar, 2006).

Aquaculture is seen, increasingly, as an alternative source of employment for fishers displaced from wild-capture fisheries. However, aquaculture increases the demands on fisheries for fresh fish as food or for fishmeal/oil, which are major constituents of carnivorous/omnivorous species' feeds (FAO, 2006). Consequently, aquaculture may not necessarily be an appropriate long-term employment solution. In addition, the establishment of aquaculture operations has frequently resulted in environmental damage to sensitive coastal zones.

Other alternative livelihood options include:

- Home-based processing and trading of marine products (e.g. dried fish, fish sauce)
- Making shell handicrafts
- Agriculture (raising crops, pig and chicken production)
- Skilled/hired labour (carpentry, construction work, factory work, masonry, stevedoring) (Salayo *et al.*, 2008)

Awareness of the impacts of IUU fishing by fishers and consumers is a key factor in addressing the problem. Palma and Tsamenyi (2008) noted the lack of educational campaigns regarding the consequences of illegal fishing activities in the Sulawesi Sea. APEC members rated public awareness of IUU fishing as medium to high level in most cases but this also varied in some cases depending on whether it was domestic or high seas fishing. Nongovernment organisations (NGOs) have been active in some economies in relation to rising awareness of the issue. For example in Indonesia, the Environmental Justice Foundation (EJF) in conjunction with the local group, JALA, have implemented a number of initiatives aimed at raising awareness of the incidence and impacts of illegal fishing (JALA/EJF, 2007). The World Wide Fund for Nature's (WWF) Sulu-Sulawesi Marine Ecoregion Programme is another example of NGO involvement in ensuring the long term sustainability of the marine environment, through a range of initiatives, including stopping IUU fishing and increasing public awareness.

6.2.4. Regional initiatives

There are very few examples of specific regional initiatives to address IUU fishing, although a number of broader agreements and cooperative frameworks in place in the Asia-Pacific region address aspects of IUU fishing and have the potential to expand their role in this area.

In addition there are a number of bilateral agreements between APEC member economies which cover management, enforcement, access to EEZs, port access, or more general cooperation on fisheries issues.

The FFA provides an example and a strong platform for the development of a regional approach to IUU fishing in the Western and Central Pacific which is currently being further developed. The members of the FFA have recognised the risk posed to their economies by

IUU fishing in the region and have previously commissioned research to: develop a methodology to estimate the level of IUU fishing in the WCPO region; to enable monitoring of trends; to promote improved understanding by FFA members of the risks posed by IUU fishing to fisheries in the region; and to promote strategies for the mitigation of the risk of IUU fishing.

A number of initiatives support a regional approach to MCS issues in the FFA region. Currently the FFA provides a regional MCS support function, there are regional multilateral surveillance and compliance operations carried out and the Niue Treaty Subsidiary Agreement allows for bilateral agreements between FFA members to delegate MCS activities. However, in 2007, the Forum Fisheries Committee recognised the value of increased regional cooperation and agreed to develop a Regional MCS Strategy. The Strategy will incorporate a Regional MCS Operational Plan which will:

- address MCS aspects of the Vessel Day Scheme[18];
- enhance national MCS activities including implementation of the NPOAs under the IPOA-IUU fishing; and
- support full FFA member engagement in high seas MCS activities through the WCPFC, such as the High Seas Boarding and Inspection Scheme, the Regional Observer Programme and future transshipment verification and catch documentation schemes (FFA, 2008).

In addition, in May 2008, fisheries ministers of countries that are Parties to the Nauru Agreement (PNA) whose members include the Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu – adopted a range of measures to further protect bigeye and yellowfin tuna stocks in their EEZs and international waters. These include:

a) foreign fishing boats will no longer be allowed to fish in high seas pockets adjacent to the PNA countries' EEZs;
b) they will be required to retain their full catches, regardless of whether or not they are tuna stocks;
c) the use of fish aggregating devices will be banned in the PNA Members' EEZs in the third quarter of each year; and.
d) there will be 100% observer coverage of all foreign purse seine fishing vessels.

Other cooperative approaches to IUU fishing in the Asia-Pacific region include the decision in 1993 by Canada, Japan, Russia and the United States to implement an integrated patrol plan in the North Pacific. The joint operations have a focus on detecting illegal high seas drift netting for salmon. Since that time Korea and China have joined the regional approach. The operations have been extremely successful, especially since 2000. Between 1993 and 1999, 37 vessels were detected and 13 arrested however in the eight years to 2007, only four vessels have been detected and of these three have been apprehended (NPAFC, 2008).

However the illegal driftnet fleet in the North Pacific is now operating in waters that overlap those of the NPAFC and the WCPFC and are targeting species of interest to the WCPFC, including tuna, swordfish and sharks. NPAFC is therefore interested in coordinating with the WCPFC to end the illegal fishing. NPAFC plans to invite representatives of the WCPFC Technical and Compliance Committee to its 2008 meeting of the Enforcement Evaluation and Coordination Committee (NMFS, 2007).

[18] The Vessel Day Scheme is a fisheries management tool applied to the purse seine fleet by Parties to the *Palau Arrangement for the Management of the Pacific Purse Seine Fishery (Palau Arrangement)*. For further details see: http://www.ffa.int/node/936.

The cooperation between Indonesia and the Philippines on fisheries matters provides a good example of what can be achieved on a bilateral basis. Indonesia and the Philippines have concluded a bilateral fishing access agreement and have implemented a general memorandum of understanding on marine and fisheries cooperation. In addition, the Australian Centre for International Agricultural Research (ACIAR) has funded research aimed at developing a regional framework for combating IUU fishing in the Sulawesi Sea, between Indonesia and the Philippines (Tsamenyi *et al*, in press). This project resulted in the development of a separate memorandum of understanding (MOU) between the Philippines and Indonesia on preventing deterring and eliminating IUU fishing. The draft MOU includes measures related to effective control over nationals, MCS, port State control, market-related measures, and exchange of information. If signed, the MOU will be the first bilateral agreement on IUU fishing in the Asia-Pacific region (Palma and Tsamenyi, 2008).

A bilateral agreement between Australia and Indonesia has provided a forum, through the Australia-Indonesian Working Group on Marine Affairs and Fisheries, for addressing IUU fishing issues. Recently this relationship has provided a basis for a broader approach to addressing IUU fishing in the Southeast Asian subregion. This is described in the Case Study on the RPOA and some details of this approach are provided below.

In May 2007 Ministers from Australia, Brunei Darussalam, Cambodia, Indonesia, Malaysia, Papua New Guinea, The Philippines, Singapore, Thailand, Timor-Leste and Viet Nam endorsed the world's first *Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (the RPOA)*. The objective of the RPOA is to enhance and strengthen the overall level of fisheries management in the region of the South China Sea, Sulu-Sulawesi Seas and Arafura-Timor Seas (Anon, 2007b).

As stakeholders with a strong interest in the fisheries in the region, Australia and Indonesia recognised that the region's countries needed to work together to find solutions to IUU fishing and promote responsible fishing practices. It was agreed that joint regional action was the best approach to address this growing problem, noting that cooperation can lessen the need for costly and difficult enforcement action against illegal fishers, and remove the havens used by them in other countries and fishing zones.

While the RPOA is a voluntary instrument it provides the framework for countries to take individual or collective action to enhance conservation and sustainable use of fisheries resources and combat IUU fishing in the region. In endorsing the framework Ministers agreed that actions need to be consistent with existing international instruments and that countries should work with the established international institutions when implementing agreed measures.

The RPOA identifies a number of specific measures to promote responsible fishing practices and to combat IUU fishing in the region. These measures include:

- understanding the current resource and management situation in the region;
- implementation of international and regional instruments;
- working with regional and multilateral organisations;
- implementing coastal State measures;
- enforcing flag State responsibilities;
- developing port State measures;
- considering regional market measures;

- developing regional capacity building;
- strengthening MCS systems; and
- controlling transshipment at sea.

An initial priority in respect of these measures focused on developing better information collection and sharing and cooperation on MCS systems. Officials have identified the following high priority areas:

- strengthening MCS systems;
- meeting all coastal States responsibilities;
- regional capacity building;
- understanding the current resource and management situation in the region; and
- implementing port State measures.

Effective MCS arrangements and operations have been highlighted and further work is being undertaken following a workshop in March 2008 to tease out key issues and develop appropriate responses.

This is an important first step in addressing the problem of IUU fishing in the region. It is however heavily dependent on individual economies implementing a range of significant measures to tackle the problem. These measures involve a range of coastal, flag and port State requirements which will in most cases require political will, significant resources and time to address the issues fully.

In addition to the RPOA, Australia and Indonesia conducted joint surveillance operations to combat illegal fishing in the Arafura Sea in 2008 (Anon., 2008e).

At a more general level, the 40th meeting of the SEAFDEC in 2008, endorsed the establishment of a "Regional Advisory Committee for Fisheries Management in Southeast Asia (RAC) as a subsidiary body of the SEAFDEC Council. The committee will assist SEAFDEC members to achieve sustainable utilization of fisheries resources through improved fisheries management for food security, sustainable livelihoods of the people, as well as economic development and integration in Southeast Asia. This will be achieved through the provision of technical advice on fisheries management issues. The advice will relate to fisheries in both marine and inland waters with particular attention to trans-boundary fish stocks. The advice may also be conveyed to the Association of Southeast Asian Nations (ASEAN) through the ASEAN Sectoral Working Group on Fisheries as well as other relevant agencies including the Coordination Committee of the RPOA (SEAFDEC, 2008).

Another high level initiative which is being developed in Southeast Asia is the Coral Triangle Initiative. This initiative brings together Indonesia, Malaysia, the Philippines, Papua New Guinea, Solomon Islands and Timor-Leste, to cooperate on a wide range of marine projects related to achieving sustainable fisheries and addressing IUU fishing, excess fishing capacity, and destructive fishing practices. Other government and key stakeholders involved in the initiative include Australia, Fiji, France, Japan, New Zealand, United Kingdom, United States, Asian Development Bank, Conservation International, Global Environment Facility, The Nature Conservancy, World Bank and WWF. This is a large, longer-term project which is only just commencing. Like the global HSTF initiative, the high level of political support and commitment to the Initiative will be central to its success.

As further example of a more general agreement, in 2003 Ministers from 12 coastal states in East Asia[19] adopted a Sustainable Development Strategy for the Seas of East Asia. One component of the strategy related to 'Equitable and sustainable fisheries and conservation of fish stocks'. The actions agreed under this component were:

1. Enhance transboundary cooperation in subregional sea areas for fisheries management by:
   a) Engaging coastal States to adopt and implement the FAO Code of Conduct for Responsible Fisheries;
   b) Increasing recognition of coastal and marine habitats that are vital to the fisheries resource of the subregional sea area;
   c) Strengthening capacity to manage living resources in the EEZ; and
   d) Putting in place subregional institutional measures to monitor the effectiveness of resource management measures.

2. Utilise living resources in a responsible manner by:
   a) Reducing excessive fishing capacity through such measures as buy-back schemes and territorial use rights;
   b) Maintaining or restoring fish stocks to levels that can sustainably support present and future generations;
   c) Applying an ecosystem management approach, inclusive of fisheries management, to planning and development of coastal and marine areas;
   d) Producing shared ownership of fisheries management through cooperative and partnership arrangements, including joint assessment of shared stocks;
   e) Enforcing fisheries regulations at national and local levels; and
   f) Developing and implementing national, and where appropriate, regional, arrangements to put into effect the FAO international plans of action, in particular, those measures to prevent, deter, and eliminate illegal, unreported, and unregulated fishing.

3. Integrate fisheries management into coastal management programmes at the local level by:
   a) Taking appropriate measures to protect the rights and livelihoods of small-scale fishers and fish workers, including community-based management;
   b) Implementing measures against destructive fishing methods and practices that result in excessive by-catch, waste of fish catch, and loss of habitat;
   c) Building capacities in appropriate aquaculture technologies to bring about fish stock conservation and diversification of income and diet;
   d) Increasing community benefits through diverse and innovative approaches to fisheries management, involving commercial, municipal, and recreational fishing, as well as cultural, conservation, trade, and tourism purposes;
   e) Preserving appropriate indigenous/traditional knowledge and practices in fisheries management, including territorial use rights in fisheries; and
   f) Developing sustainable alternative livelihoods for displaced fishers (Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), 2003).

These actions highlight the need for better and more integrated domestic fisheries management, greater cooperation with immediate neighbours and the development of alternative livelihoods for fishers displaced by more effective and sustainable management of marine resources.

[19] Brunei Darussalam, Cambodia, China, Indonesia, Japan, Malaysia, North Korea, the Philippines, Singapore, Korea, Thailand and Viet Nam

A feature of the Southeast Asian subregion that is not apparent elsewhere in the Asia-Pacific is the relatively large number of fisheries related organisations that have demonstrated an interest in addressing IUU fishing. In addition to the APEC-FWG, these include:

- ASEAN
- SEAFDEC
- The ASEAN/SEAFDEC Fisheries Consultative Group
- the proposed ASEAN Maritime Forum
- APFIC

Further, the convention areas of a number of RFMOs, including the WCPFC and the CCSBT, encompass Southeast Asian economies. Of the bodies mentioned only the two RFMOs have any charter to manage fisheries resources and to require actions of their members. The remaining organisations provide valuable mechanisms for exchange of information and the development of non-bindings agreements. However, there is little coordination between these bodies, and from an IUU fishing perspective it is unclear whether the time and effort devoted to participation in such bodies by subregional economies is maximizing use of scarce resources.

A workshop to discuss the stock take on implementation of the Bali Plan of Action identified the need to move away from the currently popular one-time workshop "best practices" model toward a more on-the-ground approach that helps APEC economies develop a strategy and ultimately implement domestic changes necessary to address identified challenges. Additionally, such capacity building should not be limited to a target audience of fisheries managers, but should also include other relevant government and industry representatives (Sea Resources Management and ANCORS, 2007).

7. CONCLUSIONS

Despite the overall paucity of data and the variability in the quality and extent of the information on IUU fishing across the subregions of the Asia-Pacific, there is sufficient information to draw some broad general conclusions. These conclusions relate to the nature and extent of the issue across the region as a whole and, to varying degrees, at the subregional level. The general findings are discussed below followed by the findings at the subregional level. As foreshadowed, findings are focused on IUU foreign fishing within EEZs and high seas IUU fishing.

7.1. General findings

Many of the overall findings of this analysis are consistent with those of studies of IUU fishing elsewhere. Similar drivers for IUU fishing exist in the Asia-Pacific region as in other parts of the world and the obstacles to addressing the problem are also similar. Key findings are as follows:

Uncertainty and data gaps

1. There remain high levels of uncertainty about the quantity and value of IUU fishing in the region and the true extent of economic, social and environmental impacts are therefore also uncertain.

2. Gaps in the data relate to:
    i. the species affected;
    ii. the quantity of species, or even groups of species, taken by IUU fishing;
    iii. the value of the IUU catch;
    iv. the total economic losses associated with that catch in terms of the income foregone from catch, processing and trade in the short term and reduced fishing, processing and tourism opportunities due to overfishing and or degradation of marine ecosystems in the longer term; and

v. the impacts on food security.

3. The lack of data, and the consequent uncertainty about the nature, extent and impact of IUU fishing in the region have consequences for:
    i. the capacity to inform policy makers of the extent and complex nature of the IUU fishing problem and the need for integrated solutions;
    ii. gaining political commitment and the financial resources to address IUU fishing;
    iii. the effective targeting of the available financial and human resources;
    iv. ensuring adequate judicial responses to IUU fishing;,
    v. the application of suitably precautionary fisheries management; and
    vi. for the monitoring of effectiveness of measures implemented to address IUU fishing.

Significance of the problem

4. Despite the lack of detailed information, this assessment indicates that IUU fishing is a significant problem in the Asia-Pacific region.

5. While there are signs that dedicated initiatives have addressed some specific IUU fishing problems in the region, there is no indication that IUU fishing across the region as a whole is declining. Rather, there are grounds to believe that the problem is likely to increase in the absence of significant intervention.

Diverse range of drivers

6. The main drivers for IUU fishing in the region are:
    i. the lack of domestic management of marine resources and fishing capacity and consequent overfishing of those resources in many economies;
    ii. a lack of capacity to enforce fisheries management measures and protect borders;
    iii. failure to control the operations of vessels operating outside their EEZs;
    iv. a lack of alternative employment opportunities for those displaced from fishing;
    v. undelimited or disputed boundaries; and
    vi. generally buoyant market conditions for seafood products.

Governance failures

7. The first five of the above drivers are symptomatic of broader systemic failures in governance in some economies and at the regional level, and the generally challenging economic and social circumstances faced by many economies in the Asia-Pacific region. These factors are characterised by:
    i. a lack of political will domestically, and in regional management fora, to implement, rather than merely articulate, the actions required to address IUU fishing;
    ii. a low level of participation in relevant binding international agreements reflecting a lack of commitment to current global views and expectations on effective fisheries management and enforcement;
    iii. the absence of effective domestic fisheries legislation and research needed to provide a platform for the introduction of domestic fisheries management measures and control of flag State vessels wherever they operate;
    iv. the failure to enforce fisheries management measures due to low levels of financial resourcing, lack of capacity to detect and prosecute infringements, corruption and/or political influence in the judicial system;

v. delays in the development and implementation of binding regional measures to address IUU fishing; and
vi. a lack of integrated policies to address the management of fisheries and the provision of alternative livelihoods for those displaced from fishing.

Need for an holistic and integrated approach

8. There is a need for an holistic and integrated approach to dealing with IUU fishing. This will require:
    i. recognition of the impacts of IUU fishing at the political level and commitment to minimising those impacts, acknowledging that this will require both short and long-term actions;
    ii. implementation of measures to minimise existing IUU fishing in parallel with improving domestic capacity to manage fisheries, enforce management measures, protect borders and control the operations of vessels fishing outside their EEZs;
    iii. commitment of resources necessary to address the drivers of IUU fishing;
    iv. cooperation between flag, port and market States;
    v. the use of catch and market-based measures;
    vi. participation in relevant international agreements and organisations and implementation of the obligations that this involves; and
    vii. adoption of bilateral, regional and multilateral arrangements, as appropriate, to deal with specific IUU fishing issues.

The extent to which these general conclusions apply across the region varies. The significance of the drivers varies across the subregions as do the species affected. As a result the economic, social and environmental impacts and the level and effectiveness of responses to IUU fishing also vary. These issues are discussed in more detail below.

7.2. Subregional findings

As discussed earlier in this report, the amount of information available on IUU fishing varied significantly across the subregions. The extent to which meaningful conclusions can be drawn on a subregional basis varies accordingly. Tables 10-13 provide a summary of key findings in relation to each of the four subregions. The following points should be noted:

- The summary tables identify only the key characteristics of IUU fishing in the subregion as a whole. For example, only the main drivers of, and main species affected by, IUU fishing have been listed but other drivers and species may also be relevant in some parts of the subregion.
- Each subregion comprises a range of economies in terms of their economic development and diversity, their reliance on fisheries catch and processing, and their human and financial capacity to address IUU fishing. Therefore, not every characteristic identified in the summary tables will apply equally to all economies in a subregion.
- “Ineffective flag State control” may refer to control by flag States located within or outside the subregion.
- The nature and extent of the economic, social and environmental impacts of IUU fishing varies markedly across economies in any subregion. An attempt has been made to identify the key elements of these impacts broadly across the subregion, and where possible, at a lower level.

7.2.1. Northern Pacific

The available estimates of the extent of IUU fishing in the subregion suggest that it is likely to be having a significant impact on a number of target species, some of which are considered either fully fished or overexploited and hence vulnerable to the additional impact of IUU fishing. The overall economic and social impacts of IUU fishing are considered moderate or low, reflecting the relatively large and diversified economies that make up the subregion (see Table 10). For specific fisheries and local regions the economic and social impacts may be far more significant.

The subregion also provides a good example of effective flag State cooperation in addressing IUU fishing. The integrated patrol plan, involving the USA, Canada, Japan, Russia, Korea and China, in respect of driftnet fishing for salmon on the high seas demonstrates the value of regional cooperation on IUU fishing. Given the success of this approach and extent to which species subject to IUU fishing are caught and traded within the subregion, there may be scope to extent this cooperation across all flag, port and market States in the subregion in relation to catch and trade of the main IUU species. Within the subregion, the major IUU fishing problem occurs in the Northwest where it is estimated that IUU fishing may still be increasing. In contrast, in the Northeast it is considered that the extent of IUU fishing is relatively low and declining.

In some economies there remains scope for stronger domestic management arrangements and increased commitment to implementation of international obligations. In the absence of effective domestic management, excess capacity in domestic waters will continue to cause overfishing of stocks and increase the incentive for IUU fishing. At the international level it is important that all economies that are eligible to do so, ratify the UNFSA and the Compliance Agreement, ensure that domestic legislation is in place to implement obligations under those agreements and make sure that agencies have sufficient human and financial resources to administer that legislation. Active participation in relevant RFMOs is also important with respect to developing and implementing effective actions to address IUU fishing.

7.2.1. Southeast Asia

Of the subregions in the Asia-Pacific, Southeast Asia is the most complex with respect to the drivers, the nature and the impacts of IUU fishing (see Table 11). Given this, it is perhaps not surprising that this subregion provides the backdrop for much of the regional literature on IUU fishing. However, despite much having been written about the problem, the extent of the problem and its economic, social and environmental impacts as a whole, remain largely unquantified. Only 30% of Southeast Asian APEC economies responded to the questionnaire hence this study was unable to provide significant additional data on the nature and extent of IUU fishing or its impacts in the subregion. Despite this, the information available suggests that the impacts of IUU fishing in this subregion are likely to be high.

Many stocks in Southeast Asia are overfished reflecting ineffective domestic management and/or enforcement. The close proximity of other EEZs, a general lack of capacity in many economies to protect their borders, sovereignty disputes and undelimited boundaries and a large number of relatively small, highly populous economies with limited economic diversity and employment opportunities, combine to create an environment conducive to IUU fishing.

At the same time these economies are heavily dependent on marine resources as a source of food, unskilled occupations, income and foreign exchange. The potential economic, social environmental impacts of IUU fishing on many economies in the region are therefore high.

Table 10: North Pacific – Key characteristics of IUU fishing in the subregion

Main Drivers	Main forms of IUU fishing	Main Species	Main Obstacles	Responses to IUU fishing	Assessed Impact of IUU fishing
Ineffective MCS • Ineffective flag State control over high seas operations of vessels • Ineffective enforcement of national regulations within the EEZ Ineffective domestic management • Excess capacity • Overfished stocks Lack of alternative employment	Illegal high seas Illegal and unreported domestic	Sea Urchins Alaska Pollock Salmon Crabs Squid	Governance: • Political will • Commitment to international obligations • Sound legislation • Management measures	**Major**: Integrated patrol plan by the USA, Canada, Japan, Russia, Korea and China focused on illegal high seas drift netting for salmon **Other:** Enhanced domestic measures to address overfishing Enhanced domestic measures to preclude market access of IUU products Reduction in high seas fleet capacity	**Economic:** • Moderate impact **Social**: • Low impact across the subregion • Moderate in specific fisheries **Environmental**: • High impact on target stocks • High impact on non-target species from driftnet fishing

Table 11: Southeast Asia – Key characteristics of IUU fishing in the subregion

Main Drivers	Main forms of IUU fishing	Main Species	Main Obstacles	Responses to IUU fishing	Assessed Impact of IUU fishing
Ineffective domestic management • Excess capacity • Overfished stocks Ineffective MCS - Ineffective flag State control of vessels in adjacent EEZs Disputed/undelimited boundaries Lack of alternative employment	Domestic illegal Foreign illegal	Commercial • Tunas etc • Reef fish • Shark Other • turtles	Governance: • Political will • Management measures • Commitment to international obligations • Sound legislation • Lack of MCS capacity (human and financial) • Litigation failure Broader political sensitivity of some issues (e.g. boundaries) Priority assigned to fisheries issues Lack of a shared vision across adjacent States for improving fisheries management and addressing IUU fishing	**Major**: • RPOA • Bilateral initiatives **Other**: • Bali Plan of Action • Joint MCS activities • Increased MCS expenditure • Alternative employment programmes • Encouragement of aquaculture	Economic: • High impact Social • High impact Environmental • High impact on target stocks • High impact on vulnerable ecosystems • High impact on protected species

Table 12: Western and Central Pacific – Key characteristics of IUU fishing in the subregion

Main Drivers	Main forms of IUU fishing	Main Species	Main Obstacles	Responses to IUU fishing	Assessed Impact of IUU fishing
Ineffective management of high seas fleets • Excess capacity • Overfished stocks Ineffective MCS • Ineffective flag State control Perverse incentives • specific access arrangements • development assistance tied to access	Foreign illegal/unreported High seas illegal and unregulated (doughnut holes and high seas)	Main Commercial: • Tunas etc • billfish • shark	Governance • Political will and financial resources • Sound legislation • Lack of MCS capacity (human and financial) • Litigation failure Broader political sensitivity of some issues (loss of revenue from access agreements) Lack of subregional cooperation on IUU fishing Lack of coordination/communication across national agencies	**Major** Development of coordinated multilateral MCS strategy and response Joint MCS activities Additional management requirements for foreign vessels under access agreements and restrictions on access to adjacent high seas. **Other** Enhanced domestic management and MCS arrangements	Economic: • High impact/loss Social • High impact Environmental: • High impact on target stocks; • Low impact elsewhere

Table 13: South Eastern Pacific – Key characteristics of IUU fishing in the subregion

Main Drivers	Main forms of IUU fishing	Main Species	Main Obstacles	Responses to IUU fishing	Assessed Impact of IUU fishing
Ineffective MCS • Ineffective flag State control over high seas operations of vessels • Ineffective enforcement of national regulations with the EEZ Ineffective domestic management • Excess capacity • Overfished stocks Lack of alternative employment	Domestic illegal High seas unregulated Foreign illegal	Sharks Sea cucumber Squid Abalone	Governance: • Political will • Commitment to international obligations • Sound legislation • Inadequate penalties Absence of effective regional agreement for high seas management of squid Priority and resources assigned to fisheries issues	Enhanced domestic MCS measures Enhanced domestic management and licensing measures Development of South Pacific RFMO Initiatives to harmonise shark conservation and management in the region	**Economic:** • High impact **Social**: • Moderate impact across the subregion **Environmental**: • High impact on target stocks

Currently however, there appears to be a lack of political recognition of the significance of the impacts. This is reflected in the level of priority assigned to fisheries issues in economies where there are many competing priorities. As a result, the human and financial resources available to support fisheries management and enforcement and border protection are not available in many cases.

The rate of participation of APEC member economies in the subregion in relevant international agreements is relatively low. Of the nine APEC economies in the subregion, seven have not ratified either the UNFSA or the Compliance Agreement. Only one has an NPOA-IUU fishing, although a further three economies have NPOAs in development. One of the economies has not ratified UNCLOS. Given the number of straddling and highly migratory stocks in the subregion the low level of ratification of the UNFSA is significant.

A number of studies have proposed that a formal multilateral management body, effectively an RFMO, is required to address fundamental deficiencies in fisheries management and IUU fishing in the subregion. However this analysis suggests that domestic management arrangements are not sufficiently developed to allow most member economies to engage in a meaningful way on a regional basis. In addition, some key stocks that are subject to IUU fishing, such as tunas, billfish and pelagic sharks, are already under the mandate of the WCPFC. Further, many of the IUU fishing issues in the subregion involve fishing by vessels from adjacent States and this highlights the key role that effective bilateral, rather than multilateral, arrangements may play in addressing the issue.

This analysis suggests that rather than add another body to the relatively large number of fisheries-related organisations in the region there may in fact be value in rationalizing the number of fisheries advisory bodies, at least in relation to their engagement in IUU fishing. There is a place for an agency to provide a forum for discussion and exchange of information on and experiences with addressing IUU fishing but currently this role appears to be spread across too many agencies. This creates a situation where a lot of time and resources are devoted to talking about the issues to the exclusion of dedicating resources to the implementation of sound domestic measures to address them.

7.2.2. Western and Central Pacific

The Western and Central Pacific is possibly the subregion which has the highest potential for economic, social and environmental losses from IUU fishing (see Table 12). This reflects the lack of diversification of many economies in the subregion and the high level of financial dependence on marine resources. The economies in the region recognised the importance of marine resources to their future well being and development many years ago. In the circumstances the development of the FFA was therefore an appropriate and logical response for this region. Similarly the development of the WCPFC provides a mechanism for further strengthening regional management through cooperation of both coastal States and distant water fishing nations (from both the Asia-Pacific and elsewhere).

The Western and Central Pacific is a highly productive region and the stock status of the key target species, while moving towards the “fully fished” level, is still broadly sustainable. The main threat of IUU fishing derives from the operations of flag States from outside the subregion. The effects of overfishing of domestic and high seas stocks in other parts of the world, combined with the inability of flag States to deal with excess capacity has pushed these fleets into high seas fisheries where not all States cooperate to produce effective management. In addition, distant water fishing nations have been keen to access these stocks and have negotiated country specific access agreements with countries in the region. These access agreements have not always provided coastal States with an equitable return for access to the stocks, with unreported catch being taken or under reporting occurring where catch is linked

to an access fee. In some instances access agreements have been negotiated as a condition of broader aid to the country in question.

IUU fishing in this subregion is predominantly illegal or unreported foreign fishing within coastal States' EEZs or high seas illegal and unregulated fishing targeting tunas, billfish and shark species.

A review of available information suggests that there is a good level of understanding of the economic, social and environmental importance of marine resources to the region but this has not always translated into political will, financial resources, legislation, management and MCS capacity within individual countries. This has motivated the positive responses currently underway which involve the development of a coordinated multilateral MCS strategy and response capability, greater coordination and sharing of MCS information, joint MCS activities and additional requirements for foreign fishing vessels operating under access agreements. Greater coordination, both of the FFA group as a whole and by subgroups, will further enhance the capacity to deal with IUU fishing. Recent MCS initiatives are positive but will require full cooperation of all Parties and ongoing funding.

The major fishing grounds, fishing States and markets for key IUU species are located within the Asia-Pacific region. Responses to IUU fishing should therefore include greater cooperation between all coastal, flag, port and market States in the region. This cooperation could take the form of enhanced MCS and trade measures that monitor catches and trade in order to minimise opportunities for IUU product to reach the market.

7.2.3. South Eastern Pacific

The assessment of IUU fishing in the South Eastern Pacific subregion presented in Table 13 is based on a very limited set of information. There remains a high degree of uncertainty about the nature and extent of IUU fishing in this subregion. The available information suggests, however, that the potential impact of IUU fishing is high given the nature of many of the economies involved. There are some positive initiatives underway, including the development of the South Pacific RFMO, which may help to address high seas IUU fishing issues, and attempts to address overall management and IUU fishing for sharks through harmonization of conservation and management measures across the subregion. It is considered that further analysis of the impact of IUU fishing issues in this subregion may be warranted in close cooperation with subregional economies.

8. RECOMMENDATIONS

The conclusions above highlight that there is no simple, single or short-term solution to IUU fishing in the Asia-Pacific region. IUU fishing is not just an issue for the fisheries sector. Successful responses will require holistic and integrated policies linked to the drivers for IUU fishing. Success will require independent action by States, bilateral action particularly by adjacent States, and multilateral action, particularly through, but not restricted to, RFMOs. It will involve greater commitment to and implementation of internationally recognised benchmarks for fisheries management and MCS.

The BPA provided much needed impetus to improve the framework for fisheries governance and management in the region. This study has repeatedly highlighted the link between sound governance and domestic fisheries management and the capacity to reduce IUU fishing. If the commitments endorsed by Ministers in the BPA are implemented, this analysis suggests that economies will be well placed to address and reduce the impact of IUU fishing. However, it is acknowledged that those commitments are substantial and ambitious.

Based on the conclusions reached in Section 7 it is recommended that:

Data and data gaps

1. using available MCS information on sightings and apprehensions, economies establish programs to collate information and develop estimates of the level of IUU fishing and the species taken in their waters;

2. periodically, economies use the estimates of IUU fishing as the basis for research into the direct and indirect economic, social and environmental impacts of IUU fishing;

3. economies that are members of RFMOs in the region should seek that those RFMOs develop and adopt methods to estimate the level of IUU fishing for key target species;

Fisheries management and broader governance

4. economies develop and implement appropriate legislation (including penalties commensurate with the impact of IUU fishing) to enable the development of formal management regimes that provide a framework for defining fisheries, limiting access to those fisheries and establishing MCS arrangements to safeguard those arrangements;

5. reflecting the commitments made by APEC economies under the Bali Plan of Action, economies progress, as a priority, fisheries management reform including:

    i. ensuring capacity does not exceed long-term resource sustainability,
    ii. enhancing MCS programs,
    iii. establishing adequate sanctions to achieve deterrence, and
    iv. adopting of ecosystem and precautionary approaches;

6. where breaches of fisheries legislation occur they are pursued to the full extent of the law;

7. economies, independently and with the assistance of donor agencies, identify and address institutional weaknesses, including a lack of professionalism and ethical conduct, which undermine the effectiveness of sound fisheries management and legislation and allow for corruption in decision making;

8. economies ensure that there is formal control and monitoring of the operations of all vessels flying their flag outside their EEZ by reviewing their current flag State arrangements to meet contemporary international obligations, including those under the UNFSA and the Compliance Agreement;

9. reflecting the commitments made by APEC economies under the Bali Plan of Action, those economies that have not ratified UNCLOS or the UNFSA, or accepted the Compliance Agreement, do so and implement their provisions through domestic legislation as a matter of urgency;

10. where appropriate, economies participate actively in relevant RFMOs, support the adoption of best practice measures to address IUU fishing and seek consistency in approaches to IUU fishing across RFMOs in the region;

11. economies engage actively in the development of the binding port State agreement and ratify and implement its requirements as soon as possible;

12. those economies that are important processors and re-exporters of fish products adopt measures to ensure that they do not facilitate trade in IUU-caught fish by immediately implementing the model port State arrangements and, where appropriate, fully implementing the requirements of any product tracking schemes;

Holistic and integrated policies

13. in order to maximise the effectiveness of capacity management schemes, economies ensure that
    i. excess fishing vessels are disposed of to reduce the chance of them engaging in IUU fishing,
    ii. all harmful subsidies to the fishing industry and any production targets are removed,
    iii. where necessary, integrated government policies, to address the issues associated with labour displaced from fishing, are developed to provide long-term alternative employment opportunities, acknowledging that these will not necessarily be marine-based, and to provide appropriate education and training;

14. economies facilitate greater coordination across their government agencies including law, customs, police, defence, foreign affairs and fisheries agencies, to maximise the effectiveness of efforts to address IUU fishing;

15. economies cooperate, to the maximum extent possible, to pursue coordinated action across flag, port and market States to address IUU fishing through controls on both catch and trade of fisheries products;

16. developed economies assess their ability to provide fisheries management expertise and other relevant assistance to economies in the region that may have limited capacity to implement the recommendations of this study and develop a coordinated and strategic approach to provision of this assistance.

The above recommendations apply to varying degrees across the Asia-Pacific region. The following recommendations reflect the study's assessment of the specific priorities within the subregions.

North Pacific

17. economies in the subregion should extend cooperation from at-sea detection and deterrence to cooperation between flag, port and market States aimed at minimizing opportunities for IUU product to reach markets;

Southeast Asia

18. improvements to the legal, policy and governance frameworks for fisheries management are required as a priority;

19. fishing capacity must be limited and excess vessels and gear removed;

20. appropriate alternative employment, providing returns commensurate with those available from the fishing industry, and retraining programs must be provided in parallel to attempts to manage fishing capacity;

21. maritime boundaries need to be formalised;

22. review the significant number of fisheries-related organisation in the region, with a view to identifying a single body with the competence and capacity to address IUU fishing by:

    i. providing a forum for exchange of information,
    ii. developing common regional approaches,
    iii. reducing duplication and improving outcomes from international cooperation,
    iv. providing a mechanism to centralise agreed action to combat IUU fishing, and
    v. providing regional economies with tangible support to combat IUU fishing;

Western and Central Pacific

23. access agreements with distant water fishing nations should be revised to minimise the incentive for underreporting and, wherever possible, should not be linked to any other development assistance;

24. developed economies must continue to support current MCS initiatives in the subregion in order to ensure their long-term effectiveness, the sustainability of marine resources and the longer-term viability of these economies;

South Eastern Pacific

25. economies should, as a matter of priority, seek to finalise negotiation of the SPRFMO convention and implement the agreed interim measures;

26. further detailed analysis of IUU fishing in this subregion should be undertaken to define more clearly the nature and extent of the impact of IUU fishing and to identify region-specific responses to the issue.

REFERENCES

Agnew, D. 2005. *Estimation of IUU in the WCPO and FAA*. Presentation to FFA Workshop on estimation if IUU in the WCPO and FFA, FFA, Honiara, 5-7 October, 2005.

Alino, P. 2002. *Fisheries Resources of the Philippines*. Paper presented at the Australian Consultation with the Philippines and Indonesia on the Identification of Researchable Options for the Development of Policy and Management Frameworks to Combat Illegal, Unreported and Unregulated (IUU) Fishing Activities in Indonesian and Philippine Waters, Wollongong, Australia, March 2002.

Anon. 2002. Illegal Fishing Still Rampant in Ri Waters," *Jakarta Post*, 20 August 2002.

Anon. 2003. 107 Foreign fishing boats impounded, *Antara*, 10 October 2003

Anon. 2005 *The Ministerial declaration from the Conference on the Governance of High Seas Fisheries and the UN Fish Stocks Agreement – Moving from Words to Action* St. John's, Newfoundland and Labrador, Canada May 1-5, 2005. Available at: http://www.dfo-mpo.gc.ca/fgc-cgp/declaration_e.htm .

Anon. 2007a. Australia promoting seaweed, coral reef cultivation among NTT fishermen, *Antara News, Indonesia*. Available at: http://www.illegal-fishing.info/item_single.php?item=news&item_id=2184&approach_id=. Viewed 19January 2008.

Anon. 2007b. *Report of the Regional Workshop to Support the Implementation of the Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (RPOA).* Hotel Siam City, Bangkok, Thailand, 13-15 November 2007.

Anon. 2008a. Unregulated fishing rife in Fiji and the Pacific because of lack of monitoring. *The Fiji Times Online*. 10 March 2008.

Anon, 2008b. RI seeks to tie fight to illegal fishing. *The Jakarta Post*, 5 March 2008.

Anon. 2008c. Indonesian govt to shoot fish poachers. *The Jakarta Post*. 04/05/08

Anon. 2008d. Overview and Objectives for Semporna Islands Darwin Project. Available at: http://www.sempornaislandsproject.com/pages/darwin/darwinproject.htm. viewed 14 march 2008.

Anon. 2008e. Joint illegal fishing operations returns without catch. *ABC News Online*, 2 May 2008.

APEC 2005. Joint Ministerial Statement from the 2nd APEC Ocean-Related Ministerial Meeting Bali, 16-17 September 2005. Bali Plan of Action: Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community. Available at: http://www.apec.org/apec/ministerial_statements/sectoral_ministerial/ocean-related/2005_ocean-related/bali_plan_of_action.html

APEC 2006. The Eighteenth APEC Ministerial Meeting, Ha Noi, Viet Nam, 15-16 November 2006: Joint statement. Available at: http://www.apec.org/apec/ministerial_statements/annual_ministerial/2006_18th_apec_ministerial.html

APFIC 2007. *APFIC Regional Consultative Workshop: Managing Fishing Capacity and Illegal, Unreported and Unregulated Fishing in Asia*, Phuket, Thailand, 13-15 June 2007. RAP Publication 2007/18. FAO Regional Office for Asia and the Pacific, Bangkok. Available at: http://www.apfic.org/modules/wfdownloads/singlefile.php?cid=41&lid=208. Viewed 5 February 2008.

AusAID 2007. Valuing Pacific Fish –An Ocean for Growth and Stability: A framework for fisheries-related development assistance in the Pacific. AusAID, Canberra.

Bailey, M. 2007. *Economic Analysis of Unregulated and Illegal Fishing in Raja Ampat, Indonesia.* A thesis submitted in partial fulfilment of the requirements for the degree of Master of Science in The Faculty of Graduate Studies (Resource Management and Environmental Studies), the University Of British Columbia October, 2007

Bernardi, S. 2006. *Letter to Chatham House from the Apostleship of the Sea – Manila, 4 May 2006*. Available at: http://www.illegal-fishing.info/item_single.php?item=document&item_id=67&approach_id=. Viewed 20 February 2008.

Burke, L., E. Selig and M. Spalding 2002. *Reefs at Risk in Southeast Asia* Washington: World Resource Institute.

Clark, L. 2006. Pacific 2020 Background Paper: Fisheries. AUSAID, Canberra, Australia.

Clarke, S. 2007. *Trading tails: Linkages between Russian salmon fisheries and east Asian markets*. TRAFFIC East Asia, Hong Kong, China. Available at: http://www.illegal-fishing.info/uploads/TRAFFIC-Russian-salmon-report.pdf.

Council of the European Union 2008. *Press Release 2881st Council meeting: Agriculture and Fisheries, Luxembourg, 23 and 24 June 2008*. 10590/08 (Presse 169). Available at: http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/agricult/101422.pdf.

DAFF and MMAF 2008. *Case Study: The Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region.*

Datuk Annuar Zaini Binyamin 2007. Tuna industry in Asia lucrative but faces many issues. Malaysian National News Agency, 27 October 2007. Available at http://www.bernama.com.my/bernama/v3/news_business.php?id=292566. Viewed 4 February 2008.

De Leon, E.H. 2004. *The Role of the Philippine Navy in Protecting the Country's Maritime Interest Particularly the Fishing Industry*". Paper presented at the 6th National Tuna Congress, General Santos City, 2-3 September 2004.

De Vantier, L., A. Alcala and C. Wilkinson 2004. The Sulu-Sulawesi Seas: Environmental and Socioeconomic Status, Future Prognosis and Ameliorative Policy Options. *Ambio*. Vol. 33, No. 1.

De Young, C. (ed.) 2006. Review of the state of world marine capture fisheries management: Indian Ocean. *FAO Fisheries Technical Paper*. No. 488. Rome, FAO.

FAO 2001. *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*. FAO, Rome. Available at: http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16007.

FAO 2004. *Report of the FAO Regional Workshop on the Elaboration of national Plans of Action to Prevent, Deter and eliminate Illegal, Unreported and Unregulated Fishing: Southeast Asia Subregion*. Penang Malaysia, 10-14 October 2004. FAO Fisheries Report No. 757, Rome. FAO.

FAO 2005a. Report of the FAO Regional Workshop on the Elaboration of National Plans of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing – Pacific Islands Subregion. *FAO Fisheries Report No. 786*, FAO, Rome.

FAO 2005b. *Review of the State of World Marine Fisheries Resources.* FAO Fisheries Technical Paper No. 457. FAO, Rome.

FAO 2005c. *General situation of world fish Stocks*. Available at: http://www.fao.org/newsroom/common/ecg/1000505/en/stocks.pdf. Viewed 7 March 2008.

FAO 2006. The State of Fisheries and Aquaculture. FAO, Rome.

FAO 2007a. *The FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing*. FAO, Rome.

FAO 2007b. *The State of World Fisheries and Aquaculture 2006*. FAO, Rome.

FAO 2008a. Capture Production 1950-2006 (Release Date March 2008). FAO Fishstat Database. Available at http://www.fao.org/fishery/statistics/programme/3,1,1/en.

FAO 2008b. Fisheries Commodities Global Production and Trade 1976-2006 (Release Date April 2007). FAO Fishstat Database. Available at http://www.fao.org/fishery/statistics/programme/3,1,1/en.

FAO 2008c (draft). Report of the FAO/APFIC/SEAFDEC Regional Workshop on Port State Measures to Combat Illegal, Unreported and Unregulated fishing. Bangkok Thailand, 31 March – 4 April, 2008. *FAO Fisheries Report* No. (Unnumbered).

FAO 2008d *Regional Fisheries Bodies, Indicative Map*. Available at: http://www.fao.org/fishery/rfb/search#rfb_map. Viewed 7 March 2008.

FFA 2006. *Fifteen Priority Issues for the Tuna Industry in Melanesia*. FFA, Honiara, the Solomon Islands.

FFA 2008. *Proposed Outline of Regional MCS Strategy Projects and Strategy: Development of an Integrated Regional MCS Strategy.*

Fox, J. and S. Sen. 2002. *A study of Socio-economic issues facing traditional Indonesian fishers who access the MOU Box.* A Report for Environment Australia.

Gianni, M. 2008. *Real and Present Danger; Flag State failure and maritime security and safety*. WWF/ITF, Oslo/London.

Gillet, R. and C. Lightfoot (2001). The Contribution of Fisheries to the Economies of Pacific Island Countries. A Report prepared for the Asian Development Bank, the Forum Fisheries Agency and the World Bank.

Glotov, D.B. and A. Yu. Blinov. 2006. *Evaluation of Loss caused by Illegal Catching Living Marine Resources in the Far East Fishing Industrial Basin: Economic Measures to Fight*

Poaching. Association of Primorye Fish Industries Companies Monograph. Available at: http://arpp.pk.ru/eng/news/show/?id=315&s=14&p=. Viewed 5 February 2008.

Government Information Office, Republic of China, 2008. *Taiwan.* Available at: http://www.gio.gov.tw/ct.asp?xItem=35668&ctNode=2592.

Greenpeace 2004. *The Threat of Pirate Fishers: The Rainbow Warrior Pacific Fisheries Tour*. Available at http://weblog.greenpeace.org/pacific/background/pirate_threat.html.

Greenpeace Australia Pacific 2006a. *Plundering the Pacific. Summary of findings of Greenpeace joint enforcement exercises with FSM and Kiribati, September 4th – October 23rd, 2006*. Available at: http://www.greenpeace.org/international/press/reports/plundering-pacific. Viewed 5 February 2008.

Greenpeace Australia Pacific 2006b. *Scientific Report on Effort Reduction Measures in the Western and Central Pacific Ocean Tuna Fishery*. http://www.greenpeace.org/raw/content/australia/news-and-events/news/science-report-2006.pdf. Viewed 9 October 2007.

Greenpeace 2007. *Fishy Business: Stolen Pacific Tuna in the European Market*. Available at: http://www.greenpeace.org/international/press/reports/stolen-pacific-tuna. Viewed 9 October 2007.

Greenpeace 2008. *Greenpeace Blacklist*. Available at: http://blacklist.greenpeace.org/vessel/list. Viewed 7 March 2008.

Heazle, N. and J.G. Butcher 2007. Fisheries depletion and the state in Indonesia: Towards a regional regulatory regime. *Marine Policy* Vol. 31

HSTF 2006. *Closing the Net: Stopping Illegal fishing on the High Seas*. Governments of Australia, Canada, Chile, Namibia, New Zealand and the United Kingdom, WWF, IUCN and the Earth Institute at Columbia University.

JALA and the Environmental Justice Foundation 2007. *When fishing turns deadly: the environmental and social impacts of illegal trawling in North Sumatra*. A briefing by JALA – The Advocacy Network for North Sumatra Fisherfolk. Available at: http://www.ejfoundation.org/page95.html. Viewed 19 September 2007.

Johnson, G. 2007. Taiwanese Illegal Fishermen Caught. *Pacific Magazine, 28 September 2007*.

Khemakorn, P. 2006. *Sustainable Management of Pelagic Fisheries in the South China Sea Region*. United Nations – The Nippon Foundation Fellow New York, November 2006. Available at www.un.org/Depts/los/nippon/unnff_programme_home/fellows_pages/fellows_papers/khemakorn_0607_thailand.pdf -

Krause, G. 2008. *Assessment of Illegal, Unreported and Unregulated Fishing in the Asia pacific Region: Case Study of Economic, Social and Environmental impacts of the Russian IUU Sea Urchin Fishery*. (draft). Explorations UnLtd. Inc.

Lawson, T. (Ed.) 2007. *Western and Central Pacific Fishery Commission Tuna Fishery Yearbook 2006*. SPC, Noumea.

Lungren, R. Staples, D, Funge-Smith, S. and Clausen, J. 2006. *Status and Potential of Fisheries and Aquaculture in Asia and the Pacific 2006*. RAP Publication 2006/22. FAO Regional Office for Asia and the Pacific, Bangkok. Available at http://www.apfic.org/.

Maguire, J-J., M. Sissenwine, J. Csirke, R. Gringer and S. Garcia 2006. The state of world highly migratory, straddling and other high seas fishery resources and associated species. *FAO Fisheries Technical Paper 495*. FAO Rome.

Mohd Nazlan Annuar 2006. Empowering communities through micro credit. Available at: http://azam.org.my/3rdvoice/ArticleWednesday29November2006.asp. Viewed 14 March 2008.

Morgan, G., D. Staples and S. Funge-Smith. 2007. *Fishing Capacity Management and IUU Fishing in Asia*. RAP Publication 2007/16. FAO Regional Office for Asia and the Pacific, Bangkok. Available at: http://www.apfic.org/modules/wfdownloads/singlefile.php?cid=41&lid=207. Viewed 5 February 2008.

MRAG. 2005a. *Review of Impacts of Illegal, Unreported and Unregulated Fishing on Developing Countries. Final Report***.** Report prepared for the UK's Department for International Development with support from the Norwegian Agency for Development Cooperation.

MRAG. 2005b. *IUU Fishing on the High Seas: Impacts on Ecosystems and Future Science Needs*. Final Report. Report prepared for the UK's Department for International Development with support from the Norwegian Agency for Development Cooperation.

MRAG and UBC. 2008. *The Global Extent of Illegal Fishing*. Available at: http://www.illegal-fishing.info/uploads/MRAGExtentGlobalIllegalFishing.pdf. Viewed 3 July 2008.

Nelson, B., C. Ellison, and E. Abetz 2006. *$388.9m budget boost in fight against illegal foreign fishing in Australian waters*. Press Release, Budget 2006-07. Tuesday, 9 May 2006.

NMFS 2007. 2007 *Report of the Secretary of Commerce to the Congress of the United States Concerning U.S. Actions Taken on Foreign Large-Scale High seas Driftnet Fishing*.

NPAFC 2008. *Enforcement Activities*. Available at: http://www.npafc.org/new/enforcement_activities.html. Viewed 13 March 2008.

Palma, M.A.E. 2005. *A review of the Philippine MCS Framework for Fisheries*. Paper presented to Pacem in Maribus XXX1 Conference 31 October – 3 November 2005, Townsville, Australia

Palma, M.A. 2006. *Analysis of the adequacy of the Philippines Legal, Policy and Institutional Framework to Combat Illegal, Unreported and Unregulated Fishing*. A thesis submitted in fulfilment of the requirements for the award of the Degree of Doctor of Philosophy, Centre for Maritime Policy, University of Wollongong, 2006.

Palma, M.A and M. Tsamenyi. 2008. *Case Study on the Impacts of Illegal, Unreported and Unregulated (IUU) Fishing in the Sulawesi Sea*. APEC, Singapore.

Peters, W. 2006. *Maritime Surveillance Agreement with France*. Press Release, New Zealand Government, Wednesday, 5 April 2006. Available at: http://www.scoop.co.nz/stories/PA0604/S00099.htm. Viewed 1 February 2008.

PEMSEA 2003. *Sustainable Development Strategy for the Seas of East Asia: Regional Implementation of the World Summit on Sustainable Development Requirements for the Coasts and Oceans*. PEMSEA, Quezon City, Philippines.

Pet-Soede, C. H.S.J. Cesar and J.S. Pet 1999. An economic analysis of blast fishing on Indonesian coral reefs. *Environmental Conservation*, 26:2, p.83

Pitcher, T., D. Kalikoski and G. Pramod (Eds) 2006. *Evaluations of compliance with the FAO (UN) Code of Conduct for Responsible Fisheries*. Fisheries Centre Research Reports 14(2), The Fisheries Centre, UBC. Available at http://public.box.net/CodeofConduct. Viewed 25 February 2008

Pomeroy, R., J. Parks, J., R. Pollnac, T. Campson, E. Genio, C. Marlessy, E. Holle, M. Pido, A. Nissapa, S. Boromthanarat and T. H. Nguyen 2007. Fish wars: conflict and collaboration in fisheries management in Southeast Asia. *Marine Policy* 31, No. 6 November 2007.

Reeve, R. 2007. *Enforcement: Challenges and Lessons Learned*. Background paper session 3: The Growth and Control of International Environmental Crime. Chatham House Workshop, 10-11 December 2007.

Salayo, N., Garces, L., Pido, M., Visvanathan, K., Pomeroy, R., Ahmed, M., Siasin, I. Seng, K. and Masae, A. 2008. Managing excess capacity in small-scale fisheries: Perspectives from stakeholders in three Southeast Asian countries. *Marine Policy* Vol. 32 (4), p. 292-700.

SEAFDEC 2008. Establishment of Advisory Body for Fisheries Management in Southeast Asia. *SEAFDEC Newsletter* Vol. 31 (1), January – March 2008.

Sea Resources Management 2008. *Case Study on Illegal, Unreported and Unregulated (IUU) Fishing off the East coast of Peninsular Malaysia*. APEC, 2008.

Sea Resources Management and ANCORS 2007. *APEC Bali Plan of Action Stock-Take Workshop Report*. APEC FWG 01/2007. Manado, North Sulawesi, Indoneisa.

Schofield, C. (unpublished). *Briefing Note: Maritime Boundary Delimitation in the Asia-pacific: A note on the Current State-of-Play*. March 2008.

Stacey, N. 2007. *Boats to Burn. Bajo Fishing Activity in the Australian Fishing Zone*. ANU E-Press, Canberra.

Staples, D. and R. Morgan. (in prep.). *Illegal, unreported and unregulated fishing in Asia and the Pacific*. FAO Regional Office for Asia and the Pacific, Bangkok. RAP Publication 2007/(un-numbered)

Sumaila, U. R., J. Alder, and H. Keith. 2006. Global scope and economics of illegal fishing. *Marine Policy* Vo. 30 (6), p. 696-703..

Teh, L and U.R. Sumaila 2006. Malthusian Overfishing in Pulau Banggi. *UBC Fisheries Centre Working Paper No. 2006-21*. Available at: www.fisheries.ubc.ca/publications/working/2006/2006-21.pdf.

Tsamenyi, M. and Q. Hanich 2008. *Addressing Corruption in Pacific Islands Fisheries: A report prepared for the IUCN PROFISH Law Enforcement, Corruption and Fisheries Project*. Available at: http://www.iucn.org/. Viewed 1 February 2008.

Tsamenyi, M., R. West and M.A. Palma (in press). *Management and Policy Frameworks for Illegal,Uunreported and Unregulated Fishing in the Philippines and Indonesia: Focus on the Sulawesi Sea*. ACIAR Project FIS/2002/019.

United Nations 1997. *The Law of the Sea*, Division for Ocean Affairs and the Law of the Sea, New York.

United Nations 2008. *World Macro Regions and Components*. Available at: http://www.un.org/depts/dhl/maplib/worldregions.htm.

UNGA 2008. *Report of the Secretary-General, Oceans and the Law of the Sea*. A/63/63.

US Government 2007. Certification of Nations whose Fishing Vessels are Engaged in Illegal, Unreported, or Unregulated fishing or Bycatch of Protected Living Marine Resources. *Federal Register, Vol. 72, No. 111, Monday June 11, 2007/Proposed Rules*.

Vaisman, A. 2002. *Trawling in the Mist: Industrial Fisheries in the Russian part of the Bering Sea*. TRAFFIC International.

Williams, M.J. 2007. *Enmeshed: Australia and Southeast Asia's Fisheries*. Lowy Institute Paper 20.

The World Bank Group 2008. *World Development Indicators*. Available at http://ddp-ext.worldbank.org/ext/DDPQQ/showReport.do?method=showReport. Viewed 20 February 2008.

Yu, H. and Y. Yu, 2008. Fishing capacity management in China: theoretic and practical perspectives. *Marine Policy* Vol. 32 (3), p. 351-359.

Zeller, F. 2008. *South China Sea headed for troubled waters: marine experts*. AFP, 12 April 2008.

ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
ANCORS	Australian National Centre for Ocean Resources and Security
APEC	Asia-Pacific Economic Cooperation
APFIC	Asia-Pacific Fisheries Commission
ASEAN	Association of Southeast Asian Nations
BPA	Bali Plan of Action
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CCBSP	Convention on the Conservation of Pollock Resources in the Central Bering Sea
CDS	Catch documentation scheme
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DAFF	Department of Agriculture, Fisheries and Forestry (Australia)
EEZ	Exclusive Economic Zone
EJF	Environmental Justice Foundation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFA	Forum Fisheries Agency
FIS	Fish Information and Services
FWG	Fisheries Working Group (APEC)
GDP	Gross Domestic Product
HSTF	High Seas Task Force
IATTC	Inter-American Tropical Tuna Commission
IPOA	International Plan of Action
IPOA-IUU Fishing	International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
IUU	Illegal, unreported and unregulated (fishing)
MMAF	Ministry of Marine Affairs and Fisheries
MCS	Monitoring, control and surveillance
MOU	Memorandum of Understanding
MRAG	Marine Resources Assessment Group Ltd
MSC	Marine Stewardship Council
NGO	Nongovernment organisation
NMFS	National Marine Fisheries Service (USA)
NPAFC	North Pacific Anadromous Fish Commission
NPOA	National Plan of Action
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PNA	Parties to the Nauru Agreement
RFMO	Regional fisheries management organisation
RPOA	Regional Plan of Action
SEAFDEC	Southeast Asian Fisheries Development Center
SPRFMO	South Pacific Regional Fisheries Management Organization
TDS	Trade documentation scheme
UBC	University of British Columbia
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
UNGA	United Nations General Assembly
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WWF	World Wide Fund for Nature

ANNEX 1 ECONOMIES, ORGANISATIONS AND INDIVIDUALS CONTACTED

	Sent Questionnaire
1. **APEC economies**	
Australia	Yes
Brunei Darussalam	Yes
Canada	Yes
Chile	Yes
China	Yes
Hong Kong, China	Yes
Indonesia	Yes
Japan	Yes
Korea	Yes
Malaysia	Yes
Mexico	Yes
New Zealand	Yes
Papua New Guinea	Yes
Peru	Yes
The Philippines	Yes
The Russian Federation	Yes
Singapore	Yes
Chinese Taipei	Yes
Thailand	Yes
The USA	Yes
Viet Nam	Yes
2. **Intergovernmental Organisations**	
APFIC/FAO Asia-Pacific	Yes
CCSBT	Yes
CCBSP	Yes
FFA	Yes
IATTC	Yes
International Pacific Halibut Commission	Yes
NPAFC	Yes
Latin American Organization for Fisheries Development	Yes
WCPFC	Yes
Secretariat of the SPRFMO	Yes
SEAFDEC	Yes
3. **Nongovernmental organisations**	
EJF	Yes
Greenpeace Australia Pacific	Yes
TRAFFIC Oceania	Yes
WWF International	Yes
4. **Individuals**	

David Agnew – MRAG
Professor Martin Tsamenyi, Director, ANCORS, University of Wollongong, Australia
Dr. Mary Ann Palma, ANCORS, University of Wollongong, Australia
Quentin Hanich, ANCORS, University of Wollongong, Australia
Associate Professor Rashid Sumaila, Fisheries Economics Research Unit, UBC
Dr Shelley Clarke, Fisheries Consultant, Japan
Professor James Fox, Australian National University
Dr Clive Schofield, QEII Research Fellow, ANCORS, University of Wollongong, Australia

ANNEX 2 RIGHTS AND RESPONSIBILITIES

Flag States

An essential prerequisite to operating a ship on the high seas is for the ship to acquire the flag of a State, usually through the act of registration of that ship with the State. UNCLOS confirms the right of every State to sail ships flying its flag on the high seas subject to some general provisions (e.g., Articles 91, 94 and 117).

Article 91 allows for every State to fix conditions for the grant of its nationality to ships, for the registration of those ships and for the right to fly its flag. It provides for ships to have the nationality of the State whose flag they fly but requires that there must be a "genuine link" between the State and the ship.

Article 94 provides a clear statement of flag State duties. Importantly and foremost it requires that "Every State shall effectively exercise its jurisdiction and control in administration, technical and social matters over ships flying its flag" (United Nations, 1997). It then goes on to cover things such as: the maintenance of a register of ships; assuming jurisdiction under its internal laws over each ship; issues relating to safety at sea; regular surveys of vessels; that each ship has an appropriately qualified master and officers; that the crew is able to observe all necessary international regulations covering safety, prevention of collusions, marine pollution etc.

The conceptual basis for these requirements is that because the high seas are not subject to the jurisdiction of any State, in order to preserve public order in the oceans, the right to navigate on the high seas must be restricted to those vessels, which through their link to the State are subject to its jurisdiction and can therefore be held to account for compliance with international rules.

The flag State has primary responsibility under international law for controlling the fishing activities of its vessels, both within its EEZ and on the high seas. However, where a foreign-flagged vessel is fishing within a coastal State's EEZ, the coastal State may take such measures as are necessary to ensure compliance with its laws and regulations. If a vessel is fishing in waters under the jurisdiction of the flag State or on the high seas, that flag State has the sole right to control the fishing activities of the vessel.

Article 116 establishes the right of all States to fish on the high seas, subject to meeting international obligations and to the general conditions established in Articles 117 to 120. UNCLOS, however, provides only limited guidance in relation to fishing on the high seas, requiring flag States to take responsibility for their vessels and nationals as necessary to conserve and manage high-seas resources. Articles 117 to 119 provide guidance on conservation objectives and general principles to be followed, including that:

- management should be based on the best scientific advice available;
- management should take into account associated and dependent species;
- States should establish RFMOs for the conservation and management of living resources; and
- scientific and statistical data should be contributed and exchanged at subregional, regional and global levels.

In principle, the implementation of flag State duties and the responsibility that States collectively conserve and manage high-seas resources are commendable. But, in reality, there have been, and continue to be, instances of lack of flag State control and failure to discharge

conservation and management obligations. This is a major problem when it comes to cooperative regional fisheries management.

As a result, a number of international fisheries agreements[20] include provisions aimed at requiring Parties to them to exercise greater control over their fishing vessels. Some of these, mentioned above, include the need for:

a) vessels authorised to fish by a flag State to comply with all subregional and regional management and conservation measures;
b) a flag State to exercise effective control over vessels and all of its international responsibilities under treaties or codes;
c) high seas fishing to be expressly authorised by the flag State;
d) effective MCS of authorised vessels;
e) the flag State to maintain records of all vessels authorised to fish and their fishing operations; and
f) these records to be collated at the regional and global level by RFMOs and the FAO.

The effectiveness of these provisions requires that flag States have ratified all the key agreements, and that they are implementing fully all the requirements of those agreements. Unfortunately, the reality continues to be otherwise. Lack of, or inadequate, flag State control remains one of the major problems in high-seas fisheries governance.

Coastal States

UNCLOS confers important rights and responsibilities on coastal States. Coastal States are able to declare EEZs of up to 200nm from their baselines. In these zones the coastal State has the sovereign right to explore and exploit living and non living natural resources. Importantly, coastal States are required, when exercising these rights, to have regard for the rights and duties of other States.

Part V (Exclusive Economic Zone) of UNCLOS (Articles 55 – 75) deals extensively with the rights and responsibilities of coastal States. These articles include specific requirements on Conservation of living resources (Article 61), Utilization of living resources (Article 62), Straddling stocks (Article 63) and Highly migratory species (Article 64).

Coastal States have an obligation to ensure through proper conservation and management and using the best scientific advice available, that living resources within their EEZ are maintained and not endangered by over exploitation. Where the coastal State is not able to harvest all the resources within its EEZ it may allow other States to harvest any surplus. Coastal States must also cooperate (where appropriate) with international organisations at the subregional, regional and global levels to achieve the conservation and management of living resources.

Coastal States also have important obligations with respect to straddling stocks and highly migratory fish stocks. They are required to cooperate directly with other coastal or fishing States or through appropriate subregional or regional bodies to ensure the conservation and management of these stocks. They must ensure compatibility of conservation and management measures and work with other States to protect fish stocks through their entire range. In addition, they have an obligation where no international organisation exists to cooperate in establishing such an organisation and to participate in the development of formal management arrangements for these stocks.

[20] The most important of these being the UNFSA where Part V deals specifically with Duties of the flag State and Article III of the 1993 FAO Compliance Agreement.

Part II of the UNFSA further elaborates coastal State obligations specifically in respect to straddling fish stocks and highly migratory fish stocks. Under the UNFSA all States have an obligation to ensure the long term sustainability of these stocks. This involves using the best available scientific advice, applying the precautionary approach and having regard to a range of broader impacts including impacts on other species within the ecosystem so as to protect the biodiversity of the marine environment.

Along with these broad rights to manage and use the resources within their EEZ and duty to cooperate with other States with respect to straddling and highly migratory fish stocks, the coastal State may implement laws and regulations consistent with UNCLOS and take actions consistent with these laws to conserve and manage the resources within its EEZ. This provides an important head of power with respect to controlling not only domestic fishing operations but also foreign incursions into the coastal State's EEZ.

Port States

A relatively new and emerging role within broader fisheries management arrangements particularly for high seas fisheries and in the fight against IUU fishing is that of port State control. As ports lie wholly within a State's territory and are therefore subject to its sovereign jurisdiction, international law acknowledges that States have wide discretion in exercising jurisdiction over what happens in their ports. This could include denial of access to a port (a closed port policy), access subject to strict arrangements (which may include detailed inspection of catch and associated records) or a more relaxed approach which allows open access and may or may not involve inspection of the vessel and/or catch.

As ports are first points of entry into a State for persons or goods they are a logical point of control to monitor and verify the activity of foreign fishing vessels. Ports are now playing a much more important role in determining whether fishing on the high seas, regardless of whether it is subject to formal management arrangements or not, is consistent with the international community's desire to conserve fish stocks. Catch and trade documentation schemes are playing an increasingly important part in the overall conservation and management measures being implemented by RFMOs. Ports play an integral role in these schemes allowing the landings and trade flows of fish products to be tracked and enabling the RFMO to determine if the fish was caught consistent with conservation and management measures.

As with all these arrangements they are only as effective as the weakest link in the chain and until all port States implement similar and consistent arrangements with respect to foreign fishing vessels entering their ports, loopholes will continue to exist. The FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing (FAO, 2007a) is a useful first step which is now being further developed with work on a legally-binding instrument on port State measures to prevent, deter and eliminate IUU fishing now well-advanced.

Market States

Market State arrangements go hand in hand with the broader rights and responsibilities outlined above although unlike the flag, coastal and port State rights and responsibilities there are no specific obligations imposed by UNCLOS or the UNFSA other than the general requirements to cooperate. Even with the most sophisticated management and conservation measures supplemented by additional arrangements such as catch and trade documentation schemes and properly monitored by port States, it is still possible for IUU product to enter markets. There are many ways this can be achieved including false labelling and shipping codes, false CDS/TDS documentation, false weight or forms of product, transshipping

product at sea and mixing it with legal product, bribing officials either in the flag State or port State or mixing product during processing in third countries.

Few States currently have domestic legislation similar to that of the US Lacey Act which makes it illegal to trade in illegally harvested product whatever its origin. The Lacey Act is a statute that is aimed directly at illicit trade in illegally caught fish and wildlife. The Act makes it unlawful for any person subject to the jurisdiction of the United States of America to "import, export, transport, sell, receive, acquire, or purchase any fish or wildlife taken, possessed, transported or sold in violation of any law or regulation of any State or in violation of any foreign law." Both criminal and civil sanctions are available under the Act, as well as forfeiture of the illegally caught fish. United States prosecutors have used the Lacey Act's provisions extensively to deal with importations of illegally caught fish.

Market States have an increasingly important role to play in helping to reduce the incentives to catch and trade in IUU fish. As the global trade in fish products continues to increase, and product is moved through more intermediate traders and processors, trying to keep track of whether the product was caught legally is becoming more difficult. Working with RFMOs and rigorously monitoring documentation will assist in maintaining the integrity of catch and trade schemes and reduce the incentives for unscrupulous operators/traders to access important markets. As with all these arrangements, it is important that as many countries as possible implement these requirements. Where possible, developing and implementing in domestic law, Lacey Act style arrangements will further assist this process.

ANNEX 3 FISHING IN THE ASIA-PACIFIC REGION

Catch by economy and key species

More than 40% of the catch taken in the Pacific Ocean is taken in the Northwest Pacific, nearly 30% in the Southeast Pacific and 20% in the WCPO (FAO, 2008a). In 2006, ten economies (China, Peru, Chile, Japan, Indonesia, the USA, the Philippines, the Russian Federation, Viet Nam and Thailand) accounted for more than 85% of the catch in the Pacific by Asia-Pacific economies (See Table A3.1).

According to FAO data, twenty species or species groups account around 65% of the total catch by volume of Asia-Pacific economies in the Pacific Ocean (see Table A3.2). However, the lack of species definition in groups such as "Marine fishes nei" (nei means not elsewhere included) masks the species composition of the catch. Questionnaire responses did however provide some insights into the key commercial species taken in the Asia-Pacific region. The top10 commercial species by volume of catch in 2006 in respondents' fisheries were:

- Ribbonfish
- Anchovy
- Japanese scad
- Small yellow croaker
- Golden threadfin bream
- Squid
- Skipjack tuna
- Borealis shrimp
- Hoki
- Snow crab

Other significant commercial species identified by respondents included yellowfin tuna, saury, scallops, bigeye tuna, lobster, tuna (unspecified), Pacific halibut, orange roughy tiger prawns, banana prawns, sharks/fins and paua (abalone).

A number of the species identified in Table A3.2 and by member economies are classified as highly migratory species under UNCLOS. As a result, the provisions of UNCLOS and the UNFSA relating to management of highly migratory species apply to stocks of these species. Management of these species on the high seas of the Pacific Ocean is the responsibility predominantly of the WCPFC and the IATTC. Catches of the major tuna species (skipjack, yellowfin, bigeye and albacore) in the Pacific Ocean were 2,771,000t in 2006 (Lawson, 2007). Other highly migratory species taken in fisheries managed by these two RFMOs include taken swordfish, frigate mackerel, other tuna species, marlins, oceanic sharks and cetaceans.

From an IUU fishing perspective, the market value of species is an important driver. Species of higher market values are generally more attractive to IUU fishers. Thus, while Peruvian anchovy comprise a high, albeit variable, proportion of the total catch in the Pacific it is used mainly in fishmeal (in 2007 valued at around US$1/kg). In comparison, the import value of yellowfin tuna into the USA in 2007 was around US$7/kg.

Table A3.1: Capture production, Pacific Ocean, Asia-Pacific economies, 2006

Economy	Tonnes ('000)	% of Pacific catch by Asia-Pacific economies
Australia	60.3	0.119
Brunei Darussalam	2.4	0.005
Cambodia	60.5	0.119
Canada	212.1	0.417
Chile	4469.6	8.792
China	14725.4	28.965
Colombia	70.0	0.138
Cook Islands	3.8	0.007
Costa Rica	20.7	0.041
Ecuador	448.6	0.882
El Salvador	41.2	0.081
Fiji Islands	44.4	0.087
French Polynesia	13.4	0.026
Guatemala	3.3	0.007
Honduras	12.6	0.025
Hong Kong, China	154.5	0.304
Indonesia	3329.9	6.550
Japan	4115.4	8.095
Kiribati	31.0	0.061
Korea, Dem. People's Rep	200.0	0.393
Korea	1511.7	2.974
Malaysia	709.6	1.396
Marshall Islands	42.0	0.083
Mexico	987.2	1.942
Micronesia, Fed. States of	11.8	0.023
Nauru	0.0	0.000
New Caledonia	3.2	0.006
New Zealand	468.1	0.921
Nicaragua	20.7	0.041
Niue	0.2	0.000
Palau	1.0	0.002
Panama	193.2	0.380
Papua New Guinea	261.7	0.515
Peru	6983.5	13.737
The Philippines	2155.7	4.240
The Russian Federation	2000.3	3.935
Samoa	3.3	0.007
Singapore	3.1	0.006
Solomon Islands	39.4	0.077

Economy	Tonnes ('000)	% of Pacific catch by Asia-Pacific economies
Chinese Taipei	701.4	1.380
Thailand	1739.3	3.421
Tonga	2.9	0.006
Tuvalu	2.2	0.004
United States of America	3075.8	6.050
Vanuatu	85.2	0.168
Viet Nam	1816.1	3.572
Wallis and Futuna Is.	0.6	0.001
Total	50838.5	0.119

Source: FAO, 2008a.

Table A3.2: Major species taken by Asia-Pacific economies in the Pacific Ocean, 2006

Species/species group	Catch ('000t)	% of total
Anchovetta (Peruvian anchovy)	7,007	13.73
Marine fishes nei	5,627	11.03
Alaska pollock(Walleye pollock)	2,860	5.61
Chilean jack mackerel	1,829	3.58
Chub mackerel	1,813	3.55
Skipjack tuna	1,748	3.43
Japanese anchovy	1,657	3.25
Largehead hairtail	1,523	2.99
Scads nei	1,156	2.27
Marine molluscs nei	995	1.95
Jumbo flying squid	849	1.66
Akiami paste shrimp	729	1.43
Various squids nei	650	1.27
Yellowfin tuna	634	1.24
California pilchard	632	1.24
Threadfin breams nei	524	1.03
Natantian decapods nei	491	0.96
Croakers, drums nei	479	0.94
Araucanian herring	440	0.86
Seerfishes nei	425	0.83

1. Nei represents 'not elsewhere included'

Source: FAO, 2008a.

Management of fish stocks

Management of fish stocks in the Asia-Pacific relies on domestic management of stocks found only within the waters of coastal States, on bi-lateral arrangements for management of some straddling stocks and on regional, multi-lateral arrangements for management of some

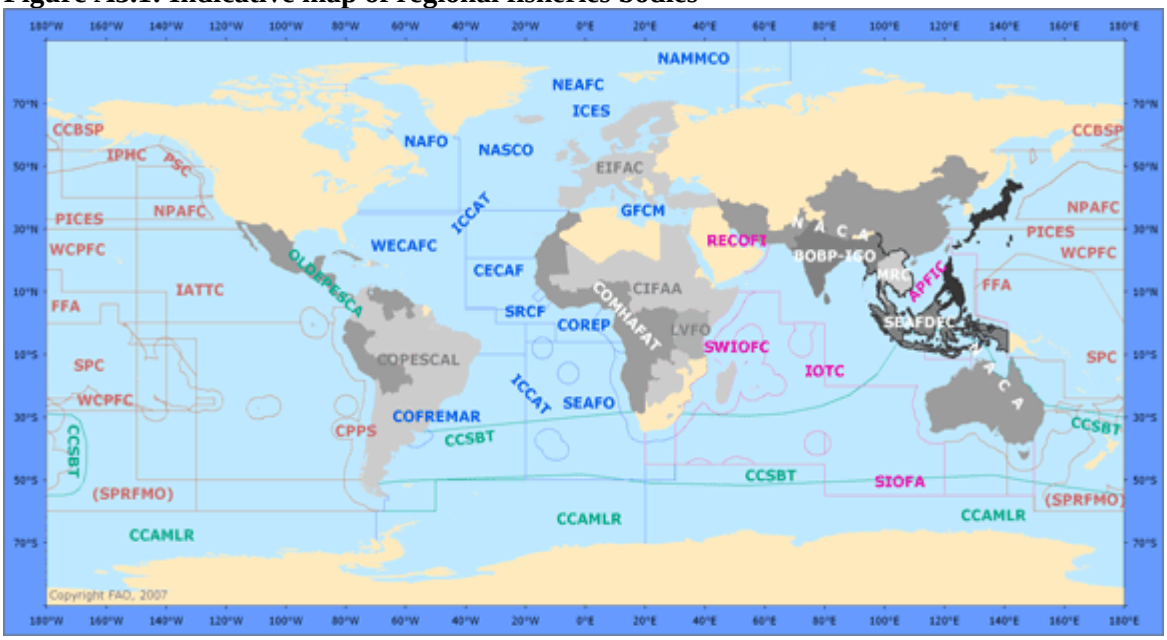
highly migratory and other high seas stocks. The nature and effectiveness of management varies considerably across individual economies and across the relevant RFMOs in the region.

Only seven member economies responded to questions relating to the nature of the management arrangements for their major commercial fisheries. This limits the extent to which meaningful conclusions can be drawn from the responses, particularly since four of the seven respondents are developed economies and their experience is unlikely to be representative of the region as a whole or of the subregions in which they are located. Further, the extent to which the situation portrayed applies to smaller fisheries is unknown. However, the seven respondents indicated that:

- laws and regulations prescribing management were in place for each of the five top commercial fisheries in each member economy and that limited entry and/or gear or catch controls were in place for all but two such fisheries;
- licenses or other fishing concession were in place for the vast majority of these fisheries';
- the fisheries were defined by area; and
- monitoring of fishing activity was in place in all but one fishery and that prosecution for fisheries offences was provided for in all fisheries.

There are six regional fishery management bodies operational in the Pacific Ocean: the CCSBT, the CCBSP, the IATTC, the International Pacific Halibut Commission, the NPAFC and the WCPFC. In addition, consultations to form the SPRFMO are well advanced. The location of each of these bodies is identified in Figure A3.1.

Figure A3.1: Indicative map of regional fisheries bodies



Source: FAO (2008d).

These bodies are responsible for management of tunas and other highly migratory species as well as come high seas and anadromous stocks of non-migratory species. However, while together these organisations cover practically all the geographic area of the Pacific Ocean, they do not either have the mandate to actively manage all the highly migratory or straddling stocks species in the region or all the discrete stocks on the high seas in the region.

Maguire *et al*. (2006) have identified the following straddling stocks in the Pacific Ocean:

- Northwest pacific: Alaska (Walleye) Pollock; flying squid; Boreal clubhook squid; Boreopacific armhook squid; Pacific Ocean perch; armourhead; and alfonsino.
- Northeast Pacific: hack mackerel; and Alaska (Walleye) pollock
- Eastern central Pacific: jumbo flying squid; horse mackerel; and chub mackerel.
- Southwest Pacific: orange roughy; oreo dories; and hoki (each associated with continental shelves); narrow-barred Spanish mackerel; oceanic squids and flying fish.
- Southeast Pacific: jumbo squid; Chilean jack mackerel; and chub mackerel

Some of these species, such as Alaska Pollock, are already managed by an RFMO. Many others will come under the management of the South Pacific RFMO when it comes into effect.

ANNEX 4 MEDIA REPORTS

In the absence of many published analyses of IUU fishing in the Asia-Pacific region, press reports of detected instances of IUU fishing provide a useful addition to our understanding of the nature and extent of IUU fishing in the region.

At least two internet-based fora now monitor media reports of IUU fishing. The Chatham House-managed illegal fishing website (http://www.illegal-fishing.info/index.php) maintains an archive of relevant media reports and the IUU-Monitoring Network provides a forum for exchange of information on IUU fishing. These two resources have been used to develop a snapshot of the nature and, to a lesser degree, the extent of IUU fishing activity in the Asia-Pacific region in the recent past (November 2006-June 2008). This information does not purport to be a comprehensive summary of illegal activity in the region over that period and is provided as indicative information only. Details have been cited as reported and no attempt has been made to confirm the details or to ascertain whether charges were laid or prosecutions successful.

Media Reports of IUU fishing in the Asia-Pacific Region November 2006 to June 2008

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
North Pacific						
18/03/08	Korea	Korea	Poaching	Minke whale		
8/11/06	Russia (Bering Sea/Kamchatka Peninsula)	Japanese vessel	Exceeded fishing quota	Alaska pollock	Trawl	40t
30/11/06			Took prohibited species	Halibut, ray, codfish, ocean perch		$8.5m roubles
22/11/06	Russia	Korean Vessel	Fishing without permission	Fish		$45,000 roubles
27/12/06	Russia	Japanese vessel	Illegal catch	Pollack		122t
19/2/07	Russia (Peter the Great Bay)	Cambodia	Fishing without a permit		Crab traps	
13/04/07	Russia	Cambodia	Poaching	Live crab		13t
05/06/07	Russia	Japan	Illegal fishing	Red salmon	Trawler	15t
27/07/07	Russia (Kamchatka)	Russia	Poaching	Salmon		60t
12/9/07	Russia (Sea of Okhotsk)	Japan	Illegal fishing	Fish	Trawler	20t
13/12/07	Russia (Okhotsk Sea and Bering Strait)	Russian	Illegal (over quota)	Crab		100,000t/year
20/12/07	Russia (near South Kuril Islands)	Japan	Illegal fishing (unauthorised) (Russia and Japan dispute ownership of the Kuril Islands)		Trawlers	4 vessels

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
02/02/08	Russia (Sea of Japan)	Belize	Suspected of illegal fishing for crabs; detained for not obeying coastguard orders and infringements of rules of fishing.			
17/03/08	Russia	Cambodia	Illegal fishing	Crabs	Crab traps	More than 1t. Prevented damage estimated at 0.5m roubles.
04/05/08	Russia	Sierra Leone Panama	Poaching	Cod, herring, crabs		4t of cod; 2t of herring; 13t of crabs valued at more than 7,000,000 rubles
23/05/08	Russia	Company (American, Russian and German citizens)	Over quota catch	King crab		23,000t
8/12/06	United States (Sacramento)	United States	Poaching – fishing under a recreational license but ignoring size and catch limits and illegal sale	Striped bass		Estimated $2000/week from sale of fish
5/12/06	United States (Hawaiian Islands longline closed area north of Kauai)	United States	Illegal fishing – fishing in a closed area			?
24/01/08	United States	United States	Taking undersized fish	Leopard sharks		465 sharks
12/07/07	United States	Mexico	Illegal fishing	Red snapper		700 fish
07/12/07	Canada	Canada	Illegal (fishing in a closed area)	Lingcod		
01/02/08	Canada	Canada	Illegally undersized gill nets			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
19/06/08	Canada	Canada	Illegal fishing Illegal mutilation of halibut Over limit catch of king salmon Failure to log catch properly	Halibut, king salmon		
Southeast Asia						
5/11/06	Philippines (southern Palawan)	Chinese vessel	Illegal fishing, poaching and catch of endangered species in violation of Philippine Law; use of cyanide which is banned under Philippine law	Live Napoleon wrasse[1] and groupers		
27/12/06	Philippines (Tubbatha Reef National Marine Park)	Chinese vessel	Poaching in Philippine waters Fishing for or taking rare, threatened or endangered species Importation or Exportation of Fish of Protected Species Violation of the National Integrated Protected Areas system Act Violation of the Wildlife Act 30 fishers apprehended	Live fish		Approx. 1600 fish including 1200 Napoleon wrasse ; groupers and red snapper
26/12/06	Australia	Australia	Poaching	Abalone		100kg estimate worth of $15,000
18/12/06	Philippines (Western Visayas)	Philippines	Unauthorised fishing or engaging in unauthorised fishing activities; use of illegal gear; Arrested 149 illegal fishers and impounded 23 fishing boats and gear over a one-month period			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
4/12/06	Thailand (Chumphon)	Viet Nam	Illegal entry and fishing Arrested and charged 11 crewmen		Trawling	
3/12/06	Philippines (Patalan Bato in Hundred Islands marine sanctuary)	Philippines	Dynamite fishing 16 fishermen arrested	Assorted fish		Estimated value of P1,800
9/1/07	Brunei Darussalam	Indonesian	Using illegal fishing methods Six fishers arrested	Shrimp	Trammel nets	
2/02/07	Australia	Australia	Fishing in closed areas Fishing without a valid authority	Sea mullet	Net	Two bins
23/02/07	Philippines (Bauang)	Philippines	Use of illegal fine mesh nets 26 fishers arrested	Assorted fish	Nets	720kg
24/02/07	Philippines (Albay)	Philippines	Illegal fishing 2 vessels seized and 27 crew arrested	Assorted fishes		6 containers
04/03/07	Philippines	Philippines	Dynamite fishing	Fish	Dynamite	6 containers
20/03/07	Australia	Australia	Fishing without a fishing concession			
27/03/07	Papua New Guinea (Western Province)	Indonesia	Illegal fishing 33 fishers arrested	Shark fin		200kg of fins dumped for health reasons
28/3/07	Australia (Bermagui, NSW)	Australia	Catching in excess of recreational bag limit (250 times the limit) and catch of a prohibited size	Abalone	Scuba diving	566 abalone

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
31/03/07	Malaysia (Northern coast of Borneo)	Chinese	Illegal fishing Violation of the Wildlife Enactment – take of a protected species	Greenback turtles Hawksbill turtle		274 turtles
02/04/07	Philippines	Viet Nam	Illegal fishing Violation of an endangered species law 10 fishers arrested	Shark		200kg of dried shark meat
12/04/07	Malaysia	Viet Nam	Illegal fishing			
17/04/07	Philippines	Chinese	Illegal fishing 47 crew and 3 vessels detained			
23/04/07	Malaysia	Viet Nam	36 crew and three boats detained	Fish		300kg of fish worth RM4,000
15/05/07	Australia	Chinese Taipei	Illegal fishing	Shark, tuna, swordfish, marlin	Longline	44t of shark, tuna, swordfish and marlin
24/5/07	Malaysia	Viet Nam	Illegal fishing			
28/05/07	Malaysia (Eastern Malaysia)	Thailand	Illegal fishing			
01/06/07	Philippines (Palawan)	Malaysia	Illegal fishing	Squid, shrimp, dried fish		
04/06/07	Malaysia	Viet Nam			Trawler	10kg
06/06/07	Philippines	Chinese	Poaching	Tuna		
7/6/07	Philippines	Chinese Taipei	Poaching			
12/6/07	Australia	Indonesia	Fishing inside Australian waters			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
15/06/07	Malaysia (Kelantan)	Thailand	Encroachment		Trawl	
18/06/07	Indonesia (	Chinese	Catch of protected species	Turtles including green and hawksbill turtles		387 turtles
13/07/07	Philippines (Celebes Sea)	Philippines	Use of fine meshed nets, commercial fishing without a licence			
04/08/07	Philippines (Iloil province)	Philippines	Illegal fishing			
10/08/07	Malaysia (Terrengganu)	Viet Nam	Illegal fishing	Fish		200kg worth $870
16/08/07	Philippines (Olotayan Island – fish sanctuary)	Philippines	Illegal fishing		Trawling	
22/08/07	Malaysia (Terengganu)	Thailand	Illegal fishing			
1/09/07	Philippines	Philippines	Illegal fishing			
3/9/07	Philippines	Philippines	Operating without a permit			
			Using fine nets			
			Using active gear			
13/09/07	Philippines	Chinese	Illegal fishing	200 Turtles and 10,000 eggs, mostly green turtles		
19/09/07	Australia	Unspecified		Trepang		
19/09/07	Australia	unspecified		Shark		
26/09/07	Indonesia	Philippines	Poaching			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
2/10/07	Australia	Australia	Illegal fishing in Great Barrier Reef green zones			
3/10/07	Australia	Australia	Possession of abalone over the legal size, possession of prohibited size abalone			234 shucked abalone
11/10/07	Philippines (Bay of Banate)	Philippines	Illegal fishing Use of fine mesh nets			
26/10/07	Thailand	Thailand	Illegal fishing (fishing in a closed area/season)			
27/10/07	Philippines	Philippines	Illegal fishing			
30/10/07	Australia	Indonesia	Illegal fishing	Shark, trepang,		125kg of trepang
31/10/07	Philippines	Philippines	Illegal fishing (without permit and use of fine mesh nets)			2 vessels
13/11/07	Malaysia	Singapore	Illegal fishing (unauthorised)		Trawlers	300kg
16/11/07	Malaysia	Malaysia	Illegal fishing	Coral		150 pieces valued at RM7,500
11/12/07	Australia	foreign vessels (unspecified flag/origin)	Illegal	Trepang		
31/12/07	Australia (Torres Strait Protected Zone)	Australia	Illegal sale of fish	Tropical rock lobster	diving	213kg
30/12/07	Philippines	Philippines	Illegal fishing (within 15km exclusion zone and using superlights)			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
31/12/07	Philippines	Philippines	Illegal export (local ban on live fish trade in Puerto Princesa City)	Live red grouper	Possibly cyanide fishing	71 specimens P200,000
9/01/08	Indonesia	Viet Nam	Illegal fishing			12 vessels
10/01/08	Korea	China	Illegal fishing (fishing without permit)			2 vessels (163t) A total of 11 vessels seized for poaching so far in 2008.
21/01/08	Indonesia	Thailand, Viet Nam and the Philippines	Illegal fishing			Indonesian Rp30trillion in 2007
02/02/08	Philippines	Philippines	Illegal fishing in prohibited grounds			
Various/02/08	Australia (NSW)	Australia	Illegal quantities of abalone; undersized abalone	abalone	Diving	3500 abalone over 2 weeks and 6000 since July 2007.
07/02/08	Philippines	Philippines	Use of illegal super lights			
16/02/08	Philippines	Philippines	Fishing within 15km of shoreline; using illegal fine mesh nets.			
25/02/08	Malaysia	Viet Nam	Illegal fishing			
26/02/08	Australia	Papua		Sea cucumber and tropical rock lobster		
03/03/08	Philippines	Philippines	Commercial fishing in Municipal waters; use of prohibited methods;			
07/03/08	Philippines	Philippines	Commercial fishing in Municipal waters; use of prohibited methods;	Assorted fish		

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
10/03/08	Australia	Papua New Guinea	Illegal fishing	Sea cucumber and tropical rock lobster		
14/03/08	Philippines	Philippines	Commercial fishing in Municipal waters; use of illegal gear			
10/04/08	Australia	Indonesia	Illegal fishing	Fish		2t of fish
13/04/08	Malaysia	Thailand	Illegal fishing		Trawling	100kg of catch
16/04/08	Philippines	Viet Nam	Poaching	Turtles and fish		
08/05/08	Australia	Australia	Illegal fishing	Rock lobster		1t valued at AU$60,000
10/5/08	Indonesia	Chinese Taipei	Illegal fishing			
15/05/08	Australia	Australia	Poaching	Abalone	Diving	843 abalone valued at AU$12000
23/05/08	Malaysia	Philippines	Illegal fishing using drift nets			
02/06/08	Philippines	Viet Nam	Illegal fishing	Milkfish		
			Fishing without a licence			
			Taking a prohibited species			
09/06/08	Viet Nam	Thailand	Illegal fishing			
WCPO						
04/1/07	Cook Islands	American Samoa (Skipper Korean national)	Illegal fishing	Tuna		18t
17/1/07	New Zealand	New Zealand	Illegal poaching – catch over daily recreational limit and catch below minimum legal size	Paua (abalone)		800 shells and meat valued at $5000

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
18/01/07	New Zealand	New Zealand	Illegal fishing in a marine reserve	Sea urchin		
02/04/07	New Zealand	New Zealand	Illegal fishing; take below minimum legal size	Paua (abalone)		300 dried paua and 400 fresh or frozen paua
21/05/07	New Caledonia	Chinese Taipei	Illegal fishing	Shark, tuna, squid		6 t of shark (including fins) 25 t of tuna (possible for shark bait) and 2 t of squid meat.
21/05/07	French Polynesia	Venezuela	Illegal fishing			80kg of fish worth US$294
24/08/07	Palau	Chinese Taipei	Shark fishing, mutilating sharks, use of steel leaders, maintaining an erroneous fishing log, fishing without a permit, failing to operate the VMS	Sharks		94 shark carcasses 11 shark heads 650 shark fins
10/09/07	Fiji	Fiji	Fishing in excess of permitted quantity (3)	Turtles		40 endangered turtles
16/9/07	Palau	Chinese Taipei fishing company				1000lbs of shark fins
28/09/07	Federated States of Micronesia	Chinese Taipei	Illegal fishing operations (VMS violation)			
2/10/07	Palau	Chinese Taipei	Shark finning violations	Shark fins		
25/10/07	Fiji	Fiji	Illegal fishing (fishing in a marine protected area)			
24/11/07	Palau	Chinese Taipei	Illegal fishing and bribery	Sharks	Longline	650 shark fins, 94 shark bodies and 10 shark heads
06/12/07	French Polynesia and the Cook Islands	Venezuela	Illegal fishing in EEZs (unauthorised)			

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
19/12/07	Palau	Philippines	Illegal fishing			
20/12/07	New Zealand	Korea	Misreporting; attributing catch from one fishing area to another area	Ling		2 vessels
15/02/08	New Zealand		Possession of undersize abalone	Paua (abalone)		68 undersize paua
19/02/08	Federated States of Micronesia	Japan	Finned sharks	Sharks	Longline	
27/02/08	Palau	Philippines registered with Filipino and Indonesian crew	Unauthorised fishing		Tuna, wahoo, rainbow runner, other smaller fish	50t
02/05/08	New Zealand	New Zealand	Misreported catch	Snapper and gurnard	5.1t	
04/06/08	New Zealand	New Zealand	Illegal fishing	Paua (abalone)	Diving	9t/NZ$1.3m
South Eastern Pacific						
26/04/07	Colombia (Malpelo marine sanctuary)	Colombia	Illegal fishing in a protected sanctuary	Sharks including hammerheads, silkies, oceanics, white fins, black fins, fox shark and reef shark		Nearly 80 shark (Approx. 2t of shark meat)
20/06/07	Ecuador		Exportation and commercialization of shark fins is illegal	Sharks	Longline	18, 673 shark fins, roughly equivalent to 4,500 sharks with a street value of USD$140,000
15/08/07	Ecuador	Ecuador	Illegal fishing	Sea cucumber		93,018 specimens

Date of report	Waters of State in which IUU fishing occurred	Nationality/Flag State of IUU fisher/vessel	Nature of infringement	Species taken	Method of fishing	Quantity/ Value estimate
5/10/07	Peru	Peru	Unlicensed fishing			17 instances in 2007
High Seas						
08/09/07	High seas	No flag Registered in China	Driftnet fishing	Shark and swordfish	Driftnet	
29/09/07	High Seas	Chinese (at least 2 of 12 vessels) 90 suspected vessels spotted	Drift netting banned by the UN		Driftnet	
14/10/07	High Seas	Chinese	Drift netting banned by the UN		Driftnet	
04/01/08	International (WCPFC)	Spanish vessels (flying Senegalese flag)	Illegal fishing (unauthorised)	Swordfish		
12/5/08	International (WCPFC)	Philippines	Unauthorised fishing			
26/05/08	International (North Pacific)	Cambodia Panama	Illegal fishing			

1. Napoleon or humphead wrasse is a CITES listed species

ANNEX 5 MARITIME BOUNDARIES

Agreed Maritime Boundaries in Southeast Asia, East Asia and the South Pacific[21]

East Asia (2)
North Korea – Russia
Korea – Japan (partial boundary agreement plus joint zone agreement)

Southeast Asia (17)

- Australia – Indonesia (multiple agreements)
- Australia – Papua New Guinea (Torres Strait)
- Australia – United Nations Transitional Authority in East Timor (UNTAET)
- Brunei (UK) – Malaysia
- Burma – India
- Burma – Thailand
- India – Indonesia
- India – Thailand
- India – Indonesia – Thailand
- Indonesia – Malaysia (two agreements)
- Indonesia – Malaysia – Thailand
- Indonesia – Papua New Guinea
- Indonesia – Singapore
- Indonesia – Thailand
- Malaysia – Thailand (two agreements)
- Malaysia – Viet Nam
- Thailand – Viet Nam

South Pacific (14)

- Australia – France (New Caledonia)
- Australia – Solomon Islands
- Cook Islands – France (French Polynesia)
- Cook Islands – United States of America (American Samoa)
- Fiji – France (New Caledonia)
- Fiji – France (Wallis and Futuna)
- France (New Caledonia) – Papua New Guinea
- France (New Caledonia) – Solomon Islands
- France (Wallis and Futuna) – Tonga
- France (French Polynesia) – UK (Pitcairn)
- New Zealand (Tokelau) – United States of America (American Samoa)
- Niue – United States of America (American Samoa)
- Papua New Guinea – Indonesia
- Papua New Guinea – Solomon Islands

Undelimited Maritime Boundaries in Southeast Asia, East Asia and the South Pacific

East Asia (8)

[21] Sourced from Schofield (2008).

- China – Japan
- China – North Korea
- China – Korea
- Japan – Philippines
- Japan – Russia
- Japan – Korea
- North Korea – Korea (Sea of Japan)
- North Korea – Korea (Yellow Sea)

Southeast Asia (12+)

- Australia – East Timor
- Brunei – Malaysia
- Cambodia – Thailand
- Cambodia – Viet Nam
- China – Philippines
- East Timor – Indonesia
- Indonesia – Malaysia (Celebes Sea)
- Indonesia – Philippines
- Indonesia – Viet Nam
- Malaysia – Philippines
- Malaysia – Singapore
- Spratly Islands (potentially multiple delimitations)

South Pacific (35)

- Cook Islands – Kiribati
- Cook Islands – New Zealand (Tokelau)
- Cook Islands – Niue
- Federated States of Micronesia – Marshall Islands
- Federated States of Micronesia – Papua New Guinea
- Federated States of Micronesia – Palau
- Federated States of Micronesia – United States of America (Guam Island)
- Fiji – Tonga
- Fiji – Tuvalu
- Fiji – Vanuatu
- France (French Polynesia) – Kiribati
- France (New Caledonia) – Vanuatu
- France (Wallis and Futuna) – New Zealand (Tokelau)
- France (Wallis and Futuna) – Samoa
- France (Wallis and Futuna) – Tuvalu
- Indonesia – Palau
- Japan – United States of America (Northern Mariana Islands)
- Kiribati – Marshall Islands
- Kiribati – Nauru
- Kiribati – New Zealand (Tokelau)
- Kiribati – Tuvalu
- Kiribati – United States of America (Baker and Howland Islands)
- Kiribati – United States of America (Jarvis Island)
- Kiribati – United States of America (Palmyra Atoll and Kingman Reef)
- Marshall Islands – Nauru

- Marshall Islands – United States of America (Wake Island)
- New Zealand (Tokelau) – Samoa
- Niue – Tonga
- Niue – United States of America (American Samoa)
- Palau – Philippines
- Samoa – Tonga
- Samoa – United States of America (American Samoa)
- Solomon Islands – Vanuatu
- Tonga – United States of America (American Samoa)
- United States of America (Guam) – United States of America (Northern Mariana Islands)

Sovereignty Disputes over Islands in the Asia-Pacific

Islands	Disputants
Pulau Batu Puteh/Pedra Branca	Malaysia – Singapore
Matthew and Hunter Islands	France – Vanuatu
The Spratly Islands (Nansha/Truong Sa Islands)	Brunei – China – Malaysia - Philippines – Chinese Taipei – Viet Nam
The Paracel Islands (Xisha/Hoang Sa Islands)	China – Viet Nam
The Senkaku/Diaoyu Islands	China – Japan – Chinese Taipei
The Liancourt Rocks (Takeshima/ Tok Do	Japan – Korea
The Kuril Islands/Northern Territories	Japan – Russia

ANNEX 6 PARTICIPATION IN ASIA-PACIFIC RFMOs AND KEY INTERNATIONAL INSTRUMENTS

Economy	UNCLOS	UNFSA	Compliance Agreement[1]	NPOA IUU	CCBSP	CCSBT	IATTC	IPHC	NPAFC	SPRFMO	WCPFC[2]	Total[3]
American Samoa											PT[4]	0/1
Australia	Y	Y	Y	Y		M[5]				P[6]	M	2/0
Brunei Darussalam	Y	N	N									0/0
Belize	Y	Y	Y				CNM[7]			P	CNM	0/2
Cambodia	N	N	N									0/0
Canada	Y	Y	Y	Y			CNM	M	M	P	M	3/1
Chile	Y	N	Y	Y						P		0/0
China	Y	N	N		M		CNM			P	M	2/1
Chinese Taipei[8]	-	-	-			M	CNM			P	M	2/1
Colombia	N	N	N				M			P		1/0
Cook Islands	Y	Y	Y				CNM			P	M	1/1
Costa Rica	Y	Y	N				M					1/0
Cuba	Y	N	N							P		0/0
Ecuador	N	N	N				M			P		1/0
El Salvador	N	N	N				M					1
European Community	Y	Y	Y	Y		CNM	CNM			P	M	1/2
Faroe Is										P		0/0
Fed. States of Micronesia	Y	Y	N	Draft						P	M	1/0
Fiji	Y	Y	N								M	1/0

Economy	UNCLOS	UNFSA	Compliance Agreement[1]	NPOA IUU	CCBSP	CCSBT	IATTC	IPHC	NPAFC	SPRFMO	WCPFC[2]	Total[3]
France	Y	Y	Y				M			P	M	2/0
French Polynesia											PT	0/1
Guatemala	Y	N	N				M					1/0
Guam											PT	0/0
Honduras	Y	N	N				CNM					0/1
Indonesia	Y	N	N								CNM	0/1
Japan	Y	Y	Y		M	M	M		M	P	M	5/0
Kiribati	Y	Y	N								M	1/0
Malaysia	Y	N	N									0/0
Marshall Islands	Y	Y	N								M	1/0
Mexico	Y	N	Y				M					1/0
Nauru	Y	Y	N								M	1/0
New Caledonia											PT	0/1
New Zealand	Y	Y	Y	Y		M				P	M	2/0
Nicaragua	Y	N	N				M					1/0
Niue	Y	Y	N								M	1/0
Northern Mariana Islands											PT	0/0
Palau	Y	Y	N								M	1/0
Panama	Y	N	N				M					1/0
Papua New Guinea	Y	Y	N							P	M	1/0
Peru	N	N	Y				M			P		1/0
Philippines	Y	N	N	Draft		CNM					M	1/1

Economy	UNCLOS	UNFSA	Compliance Agreement[1]	NPOA IUU	CCBSP	CCSBT	IATTC	IPHC	NPAFC	SPRFMO	WCPFC[2]	Total[3]
Poland	Y	Y	Y?		M							1/0
Republic of Korea	Y	Y	Y	Y	M	M	M		M	P	M	5/0
Russia	Y	Y	N		M				M	P		2/0
Samoa	Y	Y	N								M	1/0
Singapore	Y	N	N									0/0
Solomon Islands	Y	Y	N								M	1/0
South Africa	Y	Y	N			CNM						0/1
Spain	Y	Y	Y				M					1/0
Thailand	N	N	N									0/0
Timor-Leste	N	N	N									0/0
Tokelau											PT	0/1
Tonga	Y	Y	N	Draft							M	1/0
Tuvalu	Y	N	N	Draft							M	1/0
United States	N	Y	Y	Y	M		M	M	M	P	M	5/0
Vanuatu	Y	N	N				M			P	M	2/0
Venezuela	N	N	N				M					1/0
Viet Nam	Y	N	N									0/0
Wallis and Futuna											PT	0/1

1. FAO Compliance Agreement. 2. The WCPFC has three forms of membership: Member, Participating Territory and Cooperating non member. 3. Total – first digit=number of memberships (where appropriate); second digit=number of cooperating non-memberships (where appropriate). Participating in the Fourth International meeting to establish the SPRFMO is considered to be neither membership nor cooperating non-membership at this stage and is not counted here. 4. PT=participating territory. 5. M=member. 6. P=participant in the Fourth and/of Fifth International meetings to establish the SPRFMO. 7. CNM=cooperating non-member (or equivalent). 8, The diplomatic status of Chinese Taipei precludes it from ratifying agreements such as UNCLOS, UNFSA and the CA, however, they advise that they are applying the provisions of these agreements.

FWG 02/2007

Prepared by

Sustainable Fisheries Management
58 Fidge Street
Calwell ACT Australia 2905
Tel: (61) 2 6291 7690
Fax: (61) 2 6291 7690
Email: fmeere@aapt.net.au

FOR THE ASIA-PACIFIC ECONOMIC COOPERATION SECRETARIAT
35 Heng Mui Keng Terrace Singapore 119616
Tel: (65) 6891-9600 Fax: (65) 6891-9690
Email: info@apec.org Website: www.apec.org

Title: Assessment of Impacts of Illegal, Unreported and Unregulated (IUU) Fishing in the Asia-Pacific

ISBN: 978-981-08-1995-8
APEC#208-FS-01.5