REPORT OF A

# WORKSHOP ON RIGHTS-BASED MANAGEMENT AND BUYBACKS IN INTERNATIONAL TUNA FISHERIES

La Jolla, California, USA, 5-9 May 2008

## TABLE OF CONTENTS



## 1. OPENING

The meeting was opened by the Chair, Meryl Williams. She introduced Guillermo Compéan, the Director of the Inter-American Tropical Commission (IATTC), the institution hosting the Workshop, who welcomed participants to the meeting.

The financial support provided for the meeting by NOAA Fisheries of the United States was acknowledged.

## 2. INTRODUCTION AND ARRANGEMENTS

The participants of the Workshop introduced themselves, indicating their interest in the issues outlined in the prospectus for the Workshop (Appendix I). Appendix II gives the list of participants.

The provisional Agenda was adopted without any change (Appendix III).

The Chair noted that two background papers had been distributed (Appendix IV) and, in addition to presentations of those, three presentations would be made as part of Agenda item 3. The background papers, two information papers, and the presentations have been placed on the IATTC website at http://www.iattc.org/IATTC-Other-Meetings-Buyback-May2008ENG.htm.

The Chair nominated participants to introduce each of the subjects to be discussed under Agenda items 4 and 5; the summary of the discussions at the workshop would be discussed under agenda item 7, but the final editing and approval of this report would be carried out by correspondence. The Summary of Discussions is attached as Appendix V.

## 3. PRESENTATION OF THE BACKGROUND PAPERS AND OTHER MATERIAL

Kieran Kelleher outlined a possible approach for a rights-based management system for eastern Pacific

tuna fisheries and explained the approach the World Bank would have to any buyback funding, which of necessity would be commercially based.

Robin Allen presented the first background paper, *Workshop on Rights-based Management and Buybacks in International Tuna Fisheries*.

Peter Miyake made a presentation on the recent large-scale tuna longline vessel buybacks carried out for vessels from Japan, Taiwan and other Japanese-built vessels, which were considered by the organization for the Promotion of Responsible Tuna Fisheries (OPRT) to be IUU vessels.

Dale Squires made a presentation on the purposes and practicalities of vessel buyback programs.

Andrew Serdy presented the second background paper, *International Fisheries Law and the Transferability of Quota: Principles and Precedents.*

## 4. RIGHTS-BASED MANAGEMENT METHODS

James Joseph introduced the discussion on rights-based management methods;

Robin Allen introduced the discussion on limited entry;

Quentin Grafton introduced the discussion on individual transferable quotas (ITQs); and

Dale Squires introduced the discussion on the buyback of vessels or fishing rights.

Beth DeSombre introduced ideas on trade restriction instruments; and

Gary Libecap introduced research conclusions on common property and collective options.

## 5. MECHANICS OF MONITORING, CONTROL AND SURVEILLANCE

Ray Clark introduced the discussion on the mechanics of monitoring, control, and surveillance that were needed for rights-based fisheries management.

## 6. CONSIDERATIONS FOR FURTHER WORK

The workshop identified the opportunities for future work:

- Preparation of a model of a rights-based management system, which would be used as a case study for a future workshop with a focus on participation by representatives of the industry.
- Development of an economic case for a buyback and implementation of a rights-based management system.
- Development of a political feasibility analysis for rights-based fisheries management, taking account of the interests of all stakeholders.
- Dissemination of a Short Report that can be used to promote the ideas of rights-based management of tuna fisheries.

## 7. MEETING REPORT

The Workshop considered an outline of the summary of discussions and agreed on its general content, with the draft summary to be agreed by correspondence. The administrative sections of the Report will be drafted by Robin Allen.

## 8. CLOSE OF WORKSHOP

The workshop was closed at 5 p.m. on Thursday 8 May.

**APPENDIX I. Workshop prospectus**

**BRIEF**

# WORKSHOP ON RIGHTS-BASED MANAGEMENT AND BUYBACKS IN INTERNATIONAL TUNA FISHERIES

## HIGH SEAS TENURE
## BUILDING AN INTERNATIONAL FISHING RIGHTS REGIME

### BACKGROUND

**International tuna fisheries.** Tunas, which move between the high seas and the Exclusive Economic Zones, are classified as highly-migratory species and under the Law of the Sea their management requires international cooperation. Tuna fleets move between oceans seeking out and often depleting tuna stocks when the fleet capacity exceeds the sustainable yield of the stocks. The management of the tuna stocks is organized through various international fishery commissions, for example, the Inter American Tropical Tuna Commission (IATTC) which has a mandate over the area referred to as the eastern Pacific Ocean (see map below).

**International management regimes.** International tuna management regimes tend to be weak, frequently relying on compromise management resolutions, which may subject to 'opt-out' provisions by dissenting member countries. Increasingly trade measures are used to back up management decision. A major constraint is the lack of clarity on the rights over these internationally-shared fish stocks. Disputes with regard to allocation catches and disagreement over the health of the fish stocks is often compounded by the diverse interests of the region's coastal states, the interests of the fishing states from outside the region and the fishing activities of states, which are non-member of the commissions.

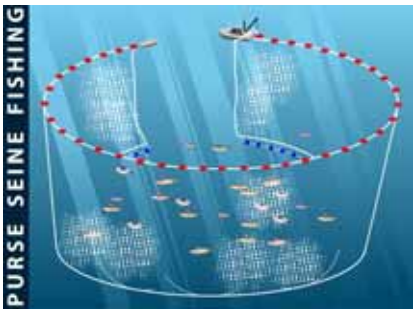
**Rights-based management approaches.** Fisheries with effectively designed and managed property rights regimes, where clear tenure and responsibilities are assigned, tend to generate more wealth and benefits and at a lower cost in terms of both harvesting and conservation and management. The establishment of such rights regimes in an international fishery poses a range of particularly difficult conceptual, political, legal and economic challenges.

### OBJECTIVE

The objective of the workshop is to address the challenge of creating an international rights-based regime for the purse seine fishery operating in the eastern Pacific Ocean.

The workshop is seen merely as a first step in addressing these issues. The workshop will sow the seeds of an idea which may take a decade to germinate. Nevertheless sustainability of ocean-wide fisheries requires regime changes and the process to transform the principles and practices of international ocean management need to be set in motion. It is envisaged that this process could develop a regional instrument with an embedded regional financing arrangement brokered by the World Bank.

## THE WORKSHOP AND THE ROLE OF THE BANK




The workshop is essentially a 'brainstorming' session bringing together key industry players and policy makers from the coastal state members of the Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, and the United States. The workshop will be backed by the scientific advice from the IATTC and other agencies such as FAO and NOAA/ NMFS.

### Role of the Bank

The World Bank's PROFISH partnership will provide financial support for the workshop. However the primary Bank input required at this stage is intellectual. The intellectual task is to design an instrument which will move the common property regime to a rights based regime, preferably with internationally tradable rights and which may contain some or all of the following characteristics:

a. The rights would be to fishing capacity (e.g. numbers of vessels) or fish (i.e. a proportion of a catch determined to be sustainable by the Commission based on the best available scientific advice).
b. The instrument would be consistent with the Law of the Sea and other relevant international instruments and conventions, including those pertaining to protected species
c. The instrument would be enforceable at national and international levels
d. It would accommodate winners and losers with regard to the initial allocation of resources and possibly compensate for subsequent changes in allocation keys resulting from natural causes, e.g. El Nino events, or management measures.
e. It would allow for international trade in the rights while maintaining the necessary political balances and equity including post harvest equity considerations (e.g. benefits from processing or vessel construction).
f. It would provide for financing the science and control (e.g. independent monitoring of catches) required to sustain the fishery as a profitable international industry.
g. It would provide mechanisms and rules to address subsidies and / or trade inequities among the coastal states involved and trade issues emerging from environmental issues (e.g. dolphin mortality)
h. It would, if necessary, finance a buyout of excess fleet capacity
i. It would move the fishery towards certification as a sustainable source of tuna supply

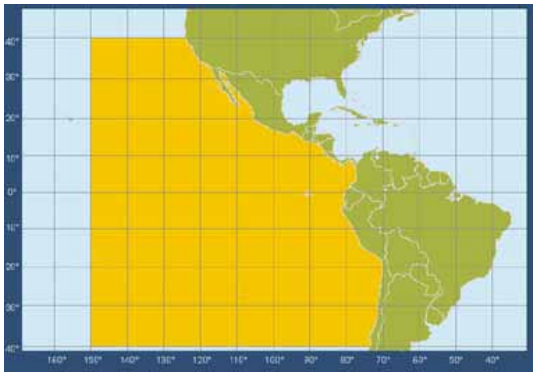
## THE FISHERY

**Why this fishery?** The Eastern Pacific Ocean purse seine fishery is chosen because there are limited numbers of 'free riders', it has a well-established commission. Fishing capacity and stocks are at manageable levels. However, it is feared that as stocks recover, fishing capacity will increase.

**Catch and fleet.** Recent tuna catches are approximately 550,000 tonnes per year. The catch value is in the order of $750 million/ year. In 2007 the purse seine fleet (237 vessels) was dominated by Ecuadorian (86) and Mexican (65) flag vessels. Purse seine vessels are highly sophisticated, with a value in the order of $20 million each, or more depending on the vessel's age. Many carry helicopters on board. There are strong links between the harvesting sub-sector (fleet) and the processors (e.g. canneries), including vertical integration and contract fishing.

This fishery occurs both within and outside the 200-mile EEZs and the tuna resources are shared by the coastal states and 'distant water fishing nations' - e.g. Japan. Almost all the catch is used for canning purposes and most canneries are located in (or are progressively moving to) the low labor cost countries in the region. The highly labor intensive tuna canning and processing plants have moved from developed to developing

countries such as Ecuador and Thailand. Relatively higher costs in island economies, such as Seychelles and Maldives, have also placed pressure on their tuna processing industries.



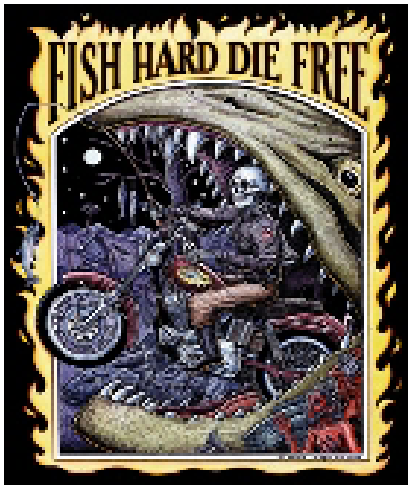
The Inter American Tropical Tuna Commission is charged with the management of this fishery (map shows area of jurisdiction). Coastal member states are: Colombia, Costa Rica, Ecuador, El Salvador, France, Guatemala, Mexico, Nicaragua, Panama, Peru and the United States. Distant water members are: Vanuatu, Venezuela, Japan, Republic of Korea and Spain.

**ISSUES**

**Political.** The political issues include disputes over international maritime boundaries; trade and environment issues such as the well-know tuna-dolphin dispute between the US and Mexico. Maintenance of a 'level playing field' among members is a political challenge as the benefits accruing to countries without a processing (e.g. canning) industry are likely to be considerably less than countries with a major tuna processing industry. At a national level, the allocation of tuna resources between the fleets is politically sensitive, e.g. between smaller inshore vessels and the offshore industrial purse seine fleet (some of which may fly foreign flags).

**Legal.** The legal issues relevant to that fishery are at both an international level and national level. At the international level, although the Law of the Sea Convention is recognized as reflecting the applicable rules of *international* law and many provisions of the UN Fish Stocks Agreement[1] may also be considered as the expression of these rules, a number of countries are still not Parties to these instruments (e.g. USA in the case of the former, most of the members of the IATTC and others in the case of the latter). Coherence and equivalence between regulatory regimes to create a level playing field at the international level also requires considerable effort and international goodwill. At national level allocation (e.g. allocation between purse seine and longline fleets) and enforcement of an internationally agreed regime pose challenges.

**Financial.** Not all IATTC member countries have significant tuna industries and the scale of their benefits from the industry may not be at parity with their contribution in terms of the tuna stocks in their economic zones (EEZs). Further, seasonal restrictions or other management measures may impact disproportionately on different IATTC members. Consequently some arrangements for compensation may be required if equitable and durable international arrangements are to be established. Similarly, at national level, there may be winners and losers and a financial package may be required to offset hardship or compensate for 'environmental services'.




**Economic.** An arms length evaluation of the benefits accruing to different countries would be required as a basis for any negotiation. This evaluation would also need to model, or make provision for gains and losses to the different actors as a result of change.

**Environmental.** Environmental issues include the tuna dolphin issue which has been the source of a major trade and environment dispute culminating in a WTO ruling. Certification of the fishery as sustainable source of supply is an emerging challenge, while high

[1] The Agreement contains principles and rules related to the international management of highly migratory stocks such as tunas.

levels of exploitation of some tuna species in the management area is a further cause of concern.

**Change management.** Categories of change drivers could be envisaged – those due to tuna management measures (such as restrictions on fishing), climate change, or aberrant markets – changes attributable to certain drivers could be eligible for compensation.

**Free riders.** These are vessels or flag states (whether IATTC members or not) which do not apply and enforce the internationally agreed management measures. The free riders benefit from reduced fishing effort by the compliant vessels and states, do not contribute to the costs of research and functioning of the Commission and may fail to report on their catches, which can undermine the statistical basis of the management science.

**PARTNERS**

**IATTC**. The Inter American Tropical Tuna Commission, established by international convention in 1950, is responsible for the conservation and management of fisheries for tunas and other species taken by tuna-fishing vessels in the eastern Pacific Ocean. Each member country of the IATTC is represented by up to four Commissioners, appointed by the respective government. The IATTC also has significant responsibilities for the implementation of the International Dolphin Conservation Program (IDCP), and provides the Secretariat for that program.

**Private sector**. The tuna industry is owned and operated by the private sector – vessel operators, processors and traders and these are essential participants in the workshop. Various private sector organizations are expected to actively collaborate.

**FAO**. Collaboration and in-kind support from FAO is expected through the PROFISH partnership.

**NOAA/NMFS**. Collaboration and in-kind support from NOAA National Marine Fisheries Service is expected either through the PROFISH partnership or directly through its staff working on tuna management issues.

**Workshop inputs from the Bank**. The Bank will help finance preparation of background papers and cover some of the workshop costs through a budget is for $60k sourced from the PROFISH DGF Grant and administered by IUCN. Inputs of Bank staff time, particularly from the LAC Region and LEG are envisaged in the form of two concept notes on:

- the regional financial instrument which could be envisaged and
- the legal dimensions of the international financial and enforcement arrangements

**Proposed workshop location and dates.** The proposed location is the Institute of Americas on the campus of the University of California, San Diego in La Jolla. The IOA has a twenty-five year history as a promoter of informed discussion and debate about public policies in the American hemisphere. At conferences organized throughout Latin America and the United States, government officials, private sector executives and representatives of non-governmental organizations exchange views on pressing contemporary economic and social issues. In-kind support is envisaged from the IOA. The proposed workshop would be planned for April 2008.

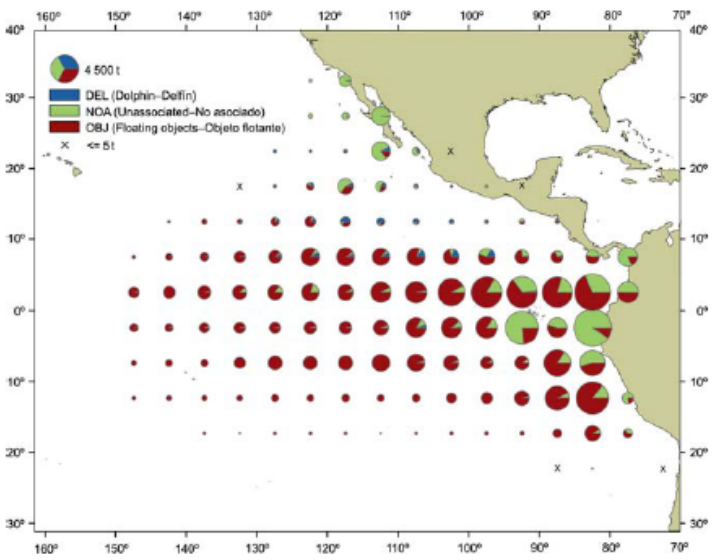



**FIGURE A-2a.** Average annual distributions of the purse-seine catches of skipjack, by set type, 1990-2004. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.
**FIGURA A-2a.** Distribución media anual de las capturas cerqueras de barrilete, por tipo de lance, 1990-2004. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

*Source: IATTC*

**APPENDIX II. List of participants**

**Dr. Meryl Williams**
**Scylla@myjaring.net**
**Chairman**

## LIST OF PARTICIPANTS


**Allen, Robin**
P.O. Box 5159
Springlands
Blenheim 7241, New Zealand
Rjallen98@ihug.co.nz

**Alsina, Hugo**
Asesor de Asuntos Internacionales
MAGA-UNIPESCA
4a Av. 22-91, zona 14
Residencias San Sur, Apto. # 2
Ciudad de Guatemala 01014
Hugo@alsina-et-al.org

**Arbuckle, Michael**
Agriculture and Rural Department
The World Bank
818 H. St. NW
Washington DC 20433
marbuckle@worldbank.org

**Sun, Chin-Hwa (Jenny)**
Institute of Applied Economics
National Taiwan Ocean University
2 Pei-Ning Road
Keelung, Taiwan 20224
jennysun@ucsd.edu

**Clarke, Raymond**
NOAA Fisheries, Pacific Island Regional Office
1601 Kapiolani Blvd. Suite 1110
Honolulu, HI 96814
Raymond.clarke@noaa.gov

**Compeán, Guillermo**
Director
Inter-American Tropical Tuna Commission
8604 La Jolla Shores Drive
La Jolla, CA 92037
gcompean@iattc.org

**Curto, Renato**
President
Tri-Marine International
222 West Sixth Street, Suite 900
San Pedro, CA 90731
rcurto@trimarinegroup.com

**Hannnesson, Rognvaldur**
Department of Economics
Norges Handelscoyskole
Helleveien 30
NO-5045 Bergen, Norway
rognvaldur.hannesson@nhh.no

**Ishimura, Gaku**
Mathematical Biology Section
National Research Institute of Far Seas
Fisheries
5-7-1 Orido, Shimizu-ku Shizuoka
424-8633 Japan
gakugaku@aol.com

**Jeon, Yongil**
10820 Corte de Marin
San Diego, CA 92130
yjeon@skku.edu

**Joseph, James**
2790 Palomino Circle
La Jolla, CA 92037
jjoseph@san.rr.com

**Kelleher, Kieran**
Agriculture and Rural Department
The World Bank
818 H. St. NW
Washington DC 20433
kkelleher@worldbank.org

**Knowles, Travis**
Department of Political Science
Social Sciences Building 301
9500 Gilman Drive 521
La Jolla, CA 92093
tknowles@ucsr.edu

**Krampe, Paul**
Executive Director
American Tuna Boat Association
2535 Kettner Blvd. Suite 3c1a
San Diego, CA 92101
krampepaul@aol.com

**DeSombre, Elizabeth**
Department of Political Science
Wellesley Collage
106 Central Street
Wellesley, MA 02481
edesombr@wellisley.edu

**Flournoy, Peter**
General Counsel
American Fishermen's Research Foundation
740 North Harbor Drive
San Diego, CA 92101-5806
phf@pacificbell.net

**Fox, William**
Director
World Wildlife Fund
Marine Fisheries Program
P.O. Box 60633
San Diego, CA 92106
bill.fox@wwfus.org

**Grafton, Quentin**
J.G. Crawford Building Building #13
Crawford School of Economics and Government
The Australian National University
Canberra ACT 0200
Australia
Quentin.grafton@anu.edu.au

**Groves, Theodore**
Department of Economics 0508
University of California San Diego
9500 Gilman Drive
La Jolla, CA 92093-0508
tgroves@ucsd.edu

**Sanchez, Andres**
Director of Resourcing
Bumblebee
P.O. Box 85362
San Diego, CA 92186
Andres.sanchez@bumblebee.com

**Squires, Dale**
Southwest Fisheries Science Center
National Marine Fisheries Service
8604 La Jolla Shores Drive
La Jolla, CA 92037
dsquires@ucsd.edu

**Lent, Rebecca**
Office of International Affairs
National Marine Fisheries Service
1315 East-West Highway, Room 12659
Silver Spring, MD 20910
Rebecca.lent@noaa.gov

**Libecap, Gary**
Donald Bren School of Environmental Science and Management
University of California Santa Barbara
Santa Barbara, CA 93106
GlibecapA@bren.ucsb.edu

**McGowan, Michael**
Vice President
Bumble Bee Seafoods, Inc.
9655 Granite Ridge Road
Suite 100
San Diego, CA 92123
mcgowanm@bumblebee.com

**Miyake, Peter**
Scientific Advisor
Japan Tuna Fisheries Co-operative Association
3-3-4 Shimorenjaku Mitaka-shi
Tokyo 181-0013, Japan
p.m.miyake@gamma.oc-n.net.jp

**Pereira, Juan A**
OPAGAC
C/Ayala 54
Madrid, Spain 28009
opagac@aattolrd.es

**Serdy, Andrew**
Institute of Maritime Law
School of Law
University of Southampton
Highfield, Southampton, S017 1BJ
United Kingdom
A.L.Serdy@soton.ac.uk

**APPENDIX III**

# AGENDA

## Workshop on Rights-based Management and Buybacks in International Tuna Fisheries

## University of California at San Diego, La Jolla, California

## May 5-9 2008

1. Welcome
2. Arrangements and Introduction of participants
3. Presentation of the background papers
4. Rights based management methods
    a. Limited entry
    b. Individual transferable quotas
    c. Buyback of vessels or fishing rights
5. Mechanics of management, monitoring, control and surveillance
6. Considerations for further work
7. Meeting report
8. Close of Workshop

**APPENDIX IV. Background papers**

*Workshop on Rights-based Management and Buybacks in International Tuna Fisheries* by Robin Allen, James Joseph, and Dale Squires.
*International Fisheries Law and the Transferability of Quota: Principles and Precedents* by Andrew Serdy.

**APPENDIX V. Summary of discussion**

# NEW INTERNATIONAL TUNA MANAGEMENT COULD BRING BIG BENEFITS

## SUMMARY REPORT OF THE WORKSHOP ON RIGHTS-BASED MANAGEMENT AND BUYBACKS IN INTERNATIONAL TUNA FISHERIES

### Sponsored by IATTC and World Bank, La Jolla, USA, 5-9 May 2008

The objective of the workshop was to address the challenges of creating international rights-based management regimes for tuna fisheries. The participants were selected to ensure that there was expertise in fisheries economics, political science, and international oceans law, and a wide range of experience in the fishing industry, government, and regional fisheries management organizations. The conclusions of the workshop represent the consensus views of the attendees and not the formal position or commitment of any participants or their companies or institutes.

Tuna fishing is a global industry, its fleets operate across different ocean jurisdictions, the product supplies global markets, and its management requires global solutions. Because all tuna stocks in waters under national jurisdictions and the high seas are already being exploited, there are no more open frontiers for tuna fishing and the time is ripe for strong, coordinated international management.

The Workshop participants concluded that, if rights-based management is done correctly in international tuna fisheries, much greater value can be created and sustained. However, the success of this new management regime will depend on governments, regional tuna management organizations, and the industry reaching agreement on how to allocate the rights.

### 1. WHY RIGHTS-BASED MANAGEMENT IN INTERNATIONAL TUNA FISHERIES?

Tuna stocks are shared across international boundaries; they migrate across national jurisdictions and high seas. Currently, international cooperation takes place under the auspices of five tuna regional fisheries management organizations (RFMOs). In 2007, the tuna RFMOs met in Kobe, Japan to share experiences. In the future, greater coordinated management across RFMOs will be required because changes in management in one organization have repercussions for fisheries managed by other organizations. Indeed, in the Pacific Ocean, the Inter-American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC) management areas overlapin part. In particular, management must be implemented by the relevant RFMO, and applied throughout the range of the stocks.

The primary objective of tuna management is the restoration of overfished tuna stocks and the maintenance of sustainability of all tuna stocks at optimal levels. Optimal levels can take account of economic efficiency and of increasing the benefits derived from the fishery, food security, an optimal level of employment in the fleet and in tuna canneries, biodiversity conservation, and ecosystem services.

To achieve these objectives, the incentives of fishers and management authorities need to be aligned. Under current management regimes, these incentives often conflict, which inhibits the effectiveness of management and decreases the value of tuna fisheries. Current management measures are inadequate for many species, especially bluefin, albacore, yellowfin, and bigeye. In all oceans there is excess fleet capacity. Rights to fish are weakly defined or non-existent. Consequently, fishers seek to increase fleet capacity in the competition for fish, which undercuts the effectiveness of management and erodes the value of the fishery.

Rights-based management (sometimes referred to as incentive-based management) offers the best opportunity for aligning public and private incentives for fisheries conservation, because it harnesses fishers' motivations to achieve management objectives by clearly defining and allocating rights and responsibilities. Because fishers derive benefits from increasing the value of the fishery, they comply

voluntarily with management measures rather than work to evade them. Successful rights-based management is supported by high-quality research, effective enforcement and well-functioning administration. The history of fisheries management reveals a number of positive examples. Iceland, Canada, Australia, New Zealand, Chile, Namibia, and the United States have all adopted some form of rights-based management for certain fisheries. Internationally, the North Pacific Fur Seal Treaty succeeded in restoring the sustainability of fur seal populations by allocating sealing rights to countries; in tuna fisheries the Agreement on the International Dolphin Conservation Program (AIDCP) succeeded in minimizing dolphin mortality in the tuna fishery in the Eastern Pacific Ocean by allocating dolphin mortality limits to individual vessels.

## 2. CONSTRAINTS TO RIGHTS-BASED FISHERIES MANAGEMENT, AND A GUIDE TO MOVING FORWARD

Despite the promise of greater benefits, the transition to rights-based fisheries management in tuna fisheries faces huge challenges. The resource, the fishing fleets, and the management authorities are diverse and international. How can the diverse interests of the fleet owners and management authorities be aligned throughout the range of the resource? Further, sunk investments, change, and the attendant uncertainty in outcomes create a natural resistance and preference for the *status quo*.

### 2.1. Constraints to rights-based tuna management

*Harmonizing management across ocean jurisdictions:* International tuna management faces the challenge of harmonizing management measures throughout the distribution of the fisheries resources, and thus across waters under national jurisdiction and on the high seas. The application of management measures in one area could cause an undesirable shift of fishing effort to other areas that do not apply similar measures. Regional and national management authorities will have to agree to harmonize their actions and work with the emerging interpretations and powers of international oceans law.

*Differing national aspirations:* Differing national aspirations and objectives can hinder attaining the greatest benefits from the fisheries. Countries will expect to retain ownership of fundamental rights and determine their own specific objectives in exercising their rights. Coastal countries will differ from distant-water fishing countries in their interests and expectations and in the trade-offs they are prepared to make. For example, some coastal developing countries have more interest in attracting tuna canneries for employment than in the employment offered on fishing vessels. Paradoxically, however, the greatest benefits of a rights-based management scheme are obtained when the rights are well specified and can be freely traded between nations. Consequently, there is an inherent tension between a government's wish to retain control of resources and to use a rights-based system to drive improved management. In reaching a balance, a government may therefore prefer to encumber rights in order to achieve some other policy objectives; for example, it may prevent the transfer of some rights to fish to vessels not flying its flag. Such encumbrances can be accommodated within a rights-based system, but at the cost of economic returns.

*Complex multiple fisheries on multi-species stocks:* The international tuna fisheries in each region use several gear types and fishing methods on many target species, generate bycatch of many different species, and are subject to ever-changing ocean ecosystems. Thus, throughout the geographic area of the fishery and beyond, the fishery components are interrelated and are affected by changes in fishing fleets, fish markets and the economy. A new rights-based management system will need to deal with the current distribution of different types of fishing gear, *e.g.*, longline, purse seine, and many small-scale gear types, and methods, *e.g.*, purse-seine fishing on fish-aggregating devices (FADs), unassociated schools, and on schools associated with dolphins, and changes in this distribution over time.

*Transferability:* Transferability of use rights is highly desirable, and indeed necessary at some levels, such as between private-sector rights holders. However, other forms of transferability of rights, such as between different gears or fishing methods, must be addressed carefully to determine the appropriate

equivalence in terms of the broader set of ecosystem impacts of the fishery (*e.g.*, target stock, incidental catch, bycatch of protected species, and habitat impacts).

*The challenges of reducing fishing capacity and limiting entrants:* With excess capacity in a fishery, management authorities will be pressured to satisfy the immediate demands of the fleet and are more likely to set unsafe catch limits or create excessive fishing rights. To remove this constraint to a successful rights-based management system, a necessary but not sufficient step is to reduce fishing capacity, typically by limiting entry or by vessel buybacks. Capacity reductions and other input controls, *e.g.*, controls on effort, such as limiting days fished, alone are unlikely to result in resource sustainability and profitability. Experience shows that such reductions can be evaded immediately by using more fishing gear and/or manpower, or by fishing longer. Over time, fishers can change vessel design and equipment so as to pack more fishing power into a given capacity regulation. More generally, technological progress will over time erode the effectiveness of any regulation based on fleet capacity by increasing the effectiveness of a vessel of any given specification. This needs to be taken into account in any such regulation. Experience shows that technical innovations and changes in fishing practices can rapidly erode the gains from reducing fishing inputs, and require further capacity reduction. Without rights-based management system, regulators and vessel owners are locked into an ongoing battle of buybacks and expanding capacity and effort.

Each new entrant to a fishery brings additional capacity and pressures on management. Therefore, limiting entry is a key element and first step in containing capacity. International law, as reflected in such instruments as UNCLOS[1], UNFSA[2] and the RFMO treaties, provide support for limiting entry. In international tuna fisheries, specific methods are needed for handling the unused capacity options, whether time-bound or open, of coastal developing countries and the fleet expansion plans of coastal and distant-water fishing countries.

**Descriptions of Rights Types**

1. Open access refers to unrestricted access to a resource.
2. Common property refers to exclusive use of a resource by a group. Limited entry, which restricts access to a fishery, can be viewed as a form of common property. Fishing cooperatives, in which a group of vessels holds the right to fish, are another form of common property. Spatial rights or territorial use rights for fisheries (TURFs) are a form of common property defined within a particular space. Common property includes property owned by a country, where rule-making authority is assigned to a public agency, and citizens have a right to use the resource within established rules.
3. Private property assigns ownership to specified persons. Private property guarantees the owners control of access to their part of the resource and the right to the bundle of socially acceptable uses and benefits. An individual transferable quota (ITQ) is a right to a share of the sustainable target level of catch in a fishery.
4. Use rights are distinguishable from property rights. Property rights entail "ownership" of the resource stock itself, but use rights do not. Use rights instead pertain to exclusive utilization or rights of access. Governments tend to retain ownership of the property and grant the right of use to individuals or groups. For example, governments may retain ownership of ITQs, but lease use rights as annual catching entitlements (ACE).

### 2.2. Experience with the use of rights for removing constraints

*Determining the most appropriate rights system:* The form of fisheries rights and the chances of management succeeding depend largely on the type of property rights system. Management systems can be based on a wide range of property rights types, on a continuum from open access to common property to private property, depending on the characteristics of the resource users and decision-makers. This continuum of rights reflects increasingly exclusive use

[1] United Nations Convention on the Law of the Sea
[2] United Nations Fish Stocks Agreement

of the resource.

Which bundle of fishery property rights emerges depends on the political constraints in effect and the ability of users to manage their activities, including their ability to exclude others. For example, governments often establish laws that prohibit the alienation of the right to exclude others from the resource, which limits the type of property regimes that might be developed. Experience has shown that when resources are well defined, costs and benefits can be apportioned more clearly, and there is a greater likelihood of private property rights emerging, such as ITQs, which are a right to a share of the total sustainable target catch, or ITEs, which are a right to a share of the total sustainable effort. Private property more directly reduces the costs of using the resource by making the full costs and benefits clear to the decision-makers.

When resources are less well bounded and defined, uses are more co-mingled, costs and benefits are more difficult to allocate among individuals, and common property is more likely. Common property is more likely also when the decision-makers are more numerous and heterogeneous, distribution of the costs and benefits is difficult, and resources are more shared. Common property can function efficiently when the group is small in numbers and more homogeneous, and its members share objectives.

Hybrid forms of property can also emerge, in which some aspects are collectively owned and others are privately owned.

*Estimating the enhanced economic benefits, gauging the political feasibility of the transition*: The most persuasive reasons for adopting rights-based fisheries management is that it will facilitate a sustainable fishery and will generate a larger stream of future economic benefits generated by the increased value of the fishery. In the case of international tuna fisheries, the extent of the economic and fisheries resource benefits needs to be estimated, and programs developed to deal with socioeconomic and environmental concerns.

Even with a strong case for transition to rights-based management, its implementation will need a detailed analysis by stakeholders of its political feasibility. Stakeholders – whether countries, fishing vessel owners or crew, or cannery workers - can be persuaded to adopt rights-based fisheries management if they stand to gain a share in this greater benefit stream. Those uncertain or likely to be disadvantaged by the change may become committed to the transition if compensation is offered, for example through a vessel or license buyback program.

*Limiting entry:* Limiting entry is typically the first management step taken in establishing a rights-based management system, based on the principle of exclusive access to a fishery for a group of vessels. Limited entry for tuna fisheries entails a mixture of limited access to national jurisdictions and to the high seas. Limited entry helps develop an environment that aligns the incentives of individual fishers with the social objectives and in which fishers can work together to achieve sustainability. Thus, limited entry may be used as part of the longer-term effort to introduce rights-based management to address the situation of existing fisheries.

Limited entry is an imperfect right, because it does not define an exclusive link to the catch. However, limiting entry is a prerequisite for a capacity buyback program, since it defines the list of eligible fishers and/or vessels, and otherwise vessels will enter the fishery as conditions improve after a buyback. Limited entry is often introduced based on the *status quo*, *i.e.* on a fisher's history in the fishery.

Limited entry is yet to be fully introduced into tuna fisheries. The IATTC's closed Regional Vessel Register is a form of limited entry. It is the most advanced limited-entry system among the RFMOs, but still requires further improvement and strengthening.

Global tuna-management solutions require a global international vessel register to underpin limited-entry provisions. The Workshop participants stressed the importance of regional tuna-management organizations understanding each other's limited entry provisions.

For example, the eastern and western Pacific Ocean tuna-management systems are linked through some overlap in management jurisdictions, movement of tunas between jurisdictions, and some common fleets. Within the area of the Western and Central Pacific Fisheries Convention, the eight Pacific island countries in the Nauru Agreement have recently replaced the previous limited vessel entry scheme with a limited fishing day scheme, the Vessel Day Scheme (VDS). This is a form of individual transferable effort and represents a rights-based management system. The Workshop participants noted the VDS, and recognized that further information was needed to understand its objectives and operations in reducing catch of key species such as bigeye.

*Buyback programs:* Buybacks of fishing vessels, gear, or rights (such as catch rights) can facilitate a transition to a longer-term objective of rights-based management. Buybacks are not necessarily required to move to rights-based management, because the internal restructuring of an industry after the introduction of rights-based management will reduce the number of vessels. Buybacks may, however, be an important factor in facilitating a change to rights-based management, as they will help the economic transition by "buying out" unnecessary sunk investment in human and technological capacity. Buybacks that are not followed by a rights-based framework do not, however, change the underlying incentive to add capacity. Buybacks in a multi-national tuna fishery need to be conducted by multiple nations. Multilateral buybacks are required in a transnational tuna fishery; otherwise, unilateral buybacks by a single country simply remove fishing capacity from the nation itself and open up opportunities for free riding by other countries.

In a transnational tuna fishery, buybacks and their financing may have to be rooted in individual countries, each of which must perceive that the buyback is in its best interests. Buybacks may also be tailored to allow for the expansion of economic activities by coastal countries. Compensatory mechanisms can address asymmetries among nations.

Buybacks may be conducted in multiple rounds, often because of budgetary limitations, but there can also be advantages related to learning as the buyback authority gains more information and experience. Conversely, as the number of vessels declines due to buybacks, costs can sometimes rise over time. Multiple rounds also facilitate tailoring the buyback by fishing gear or method. Buybacks are often purchased by reverse auctions, in which vessel or rights owners set a price which the buyback authority can accept or reject, starting with the lowest price, the next lowest price, and so on. More information is available to the buyback market than the alternative approach of a fixed price offered by the buyback authority, so a reverse auction has the potential for greater cost-effectiveness. In the IATTC area, buybacks could be aimed at reducing the use of gears, such as purse seines or longlines, in general, or of specific fishing methods, such as purse-seine fishing associated with dolphins or FADs , to achieve objectives of public good such as biodiversity conservation.

Buyback programs can purchase the vessel and/or license. If only the license or right is purchased, the vessel is free to fish elsewhere. If only the vessel is purchased but not the permit, the permit holder can purchase another vessel (unless prevented by the program). If both the license and vessel are purchased, the price includes the values of both assets. Many programs must buy out many vessels or rights of access due to latent capacity (low-activity vessels). Purchasing high-activity vessels can be expensive and quickly consume the entire budget, while purchasing only a limited number of vessels. Reverse-bid auctions, in which the buyer puts up the price, are the most common form of buybacks. Even with such attempts to control price, buybacks can be costly. Additional but related concerns include whether or not to scrap vessels or restrict their use in another fishery, to preclude adverse spillovers into other fisheries.

The buyback by Japanese Government and the Organization for the Promotion of Responsible Tuna fisheries (OPRT) of large-sized super-freezer longline vessels over 1999-2003 offers a prominent case study of an international buyback. This program by the Japanese and Taiwanese governments and industries consisted of the following five steps, two national and three multi-lateral. First, the Japanese government provided US$ 350 million to buy back vessels and cancel licenses of 20% (or 132 vessels) of

its own longliners. The payments were made only after the scrapping had been verified. The final cost was about two-thirds of the expected cost. Second, the Taiwanese government and industry bought back and scrapped 183 vessels and cancelled their licenses. Those vessels were of their own flag or constructed in Taiwan and flying flags of convenience. The estimated cost was US$ 270 million. Third, the Japanese Government made a loan of about US$ 32 million to OPRT to buy back and scrap 62 flag-of-convenience longliners, originally constructed in Japan but currently owned by Taiwanese companies. In reality, only 43 such longliners were removed. This loan is currently being repaid by special contributions by Japanese and Taiwanese longline fishers, related in part to the quantity of fish landed. Fourth, 69 flag-of-convenience longliners were transferred to Vanuatu or Seychelles flag, paying US$ 2 million per vessel. The corresponding number of Japanese licenses was cancelled. Fifth, any super-freezer longliners not registered with the OPRT would be considered IUU vessels.

The buyback program reduced the numbers of longliners considered by the OPRT to be IUU vessels from about 300 to 30, and reduced total size of the fleet of large longliners considerably. However, contrary to expectations, these reductions did not result in higher catch rates or an increase in the price of the product, most likely due to increased effort by coastal small-scale longliners, increased tuna-farming activities, and continuing high catches of juvenile tunas by purse seiners.

*Start-up funds:* Start-up funds are necessary to enable the transition to rights-based fisheries management by funding both buybacks to reduce capacity and compensation for those stakeholders initially disadvantaged. Ultimately, start-up funds can be repaid from the future economic benefits generated by the increased value of the fisheries.

Financing a multilateral buyback may involve a loan from an international institution. Such loans may require lending directly to the participating countries that will be responsible for repaying the loan. Countries can levy landings taxes to repay the loan, on the premise that fewer vessels catching the same quantity of fish can enjoy greater returns through more fish and lower costs from economies of scale. Higher prices would not be expected if the same supply of fish is generated.

*Third-party intervention*: a third party can ease the transition to a rights-based management system by providing access to. and/or responsible management of. start-up funds. A third party should have a reputation for integrity, the ability to help overcome conflicts of interest, experience with development planning and management, knowledge of financial instruments, and the ability to command financial accountability from countries and RFMOs.

*The role of RFMOs*: RFMOs have the knowledge of the tuna fisheries, the administrative framework, and some of the management systems necessary to facilitate the transition to rights-based management. RFMOs can also establish limited entry, a necessary precondition for rights-based fisheries management.

*Enforcing rights-based management systems:* Property rights require enforcement, and few effective alternatives are available for fisheries in the high seas. Enforcement of regulations and rights-based management in international fisheries will probably entail trade measures applied in a manner acceptable to the World Trade Organization and withholding access to national waters and ports. Trade measures can limit imports, landings, and transshipment of fish to those that are caught inside the regulatory framework.

Currently, some RFMOs use versions of trade measures to encourage participation and compliance. Some governments, and the United States and European Union (EU) in particular, are considering fuller application of trade measures to all fish imports. The specific components of trade measures include: (1) lists of vessels allowed (or not allowed) to fish in a certain area; (2) catch or trade documentation; (3) vessel monitoring; and ultimately, (4) members refusing to import fish without documentation. Some RFMOs have tried versions of this approach, most fully ICCAT and CCAMLR, and through the documentation requirements have decreased fishing outside the regulatory process and encouraged states to join or cooperate with the organization. Potential difficulties with trade measures include

comprehensive documentation/monitoring obligations, although these may also be part of ITQ documentation, and that the use of trade measures requires participation by major market and landing states.

Market instruments such as ecocertification and country (or waters) of origin labelling could be explored further for their ability to assist the enforcement and awareness of tuna resource sustainability. Certification programs, certifying compliance with sustainability criteria, including stock condition and harvesting methods, can provide additional incentives for all involved in the harvesting and consumption of tunas. The AIDCP came about as a result of US embargoes of nations fishing for tuna in association with dolphins; its objective was to reduce dolphin mortality caused by the fishery to biologically insignificant levels, and thereby gain access to the US market. A global tuna program, along the lines of the US National Marine Fisheries Service's FishWatch Program, which provides consumers with the facts they need to make informed choices regarding seafood, could support market-oriented instruments.

Monitoring, Control and Surveillance (MCS) underpins any form of rights-based management. An MCS system observes the fishing industry's activities as part of monitoring, compliance, and enforcement. The enforcement of any use or property right is fundamental to its exclusive use, adherence to the rules and laws of its operation and the overall fishery management system in which the right is embedded, and the right's overall effectiveness. For example, without a well-functioning MCS, the number of vessels operating in the fishery can expand beyond the limit of a limited access system, and effective MCS facilitates compliance with individual quota holdings and helps limit discards of overages. A secondary but important task is collection of the data that underpin fisheries management and population assessments. Most of these data are obtained from the commercial fishery, and the ability of scientists to make accurate predictions about sustainable harvest rates is directly related to the completeness, accuracy, and reporting consistency of these data.

MCS is an issue across all forms of property and use rights, even open access, because of the need for scientific monitoring and assessments. Weaker rights tend to require less detailed, accurate, and timely data for the enforcement and functioning of the right. Limited access requires verification of the number and sometimes size of vessels,. Transferable harvest rights require more information, including accurate, timely, and comprehensive data on quota ownership, including transfers, individual catches to ensure that quota shares are not exceeded, and the scientific data base. Data on quota harvests cannot rely simply on personal records, but instead require data that are readily accessible and verifiable by third parties. Accurate and timely data on quota transfers are required to balance quotas and catches with quota shares.

Some MCS information is common to all forms of property rights. Gear restrictions and time-area closures for the purposes of sustainability require MCS in the form of on-board observers and/or periodic inspections at sea, since onshore inspections can be easy to circumvent. At-sea transfers of catches can be used to deliberately misrepresent the catcher vessel's identity, to circumvent catch or valid quota limits, or prohibitions for other sustainability purposes, and need to be addressed in any form of rights-based management with Total Allowable Catches (TACs) or other sustainability requirements. Measures of on-board catch data (including species composition) are only estimates, and accurate and precise information is not usually obtained until the first commercial transaction occurs, which is typically during unloading. The deliberate misreporting of landings distorts subsequent stock assessments, compliance with TACs and other regulations, and the functioning of any quota form of rights. Bycatch concerns are also common in rights-based management, and MCS that captures accurate information on bycatches that are discarded at sea can be important.

MCS relies on social norms, such as the trust that fishers will abide by the rules, regulations, and laws of their own accord, but verification and documentation nonetheless remain important for sanctions on violators, assessments of populations, and development of sustainable target harvest goals. Information requirements increase with stronger and more comprehensive rights. Sanctions for failure to comply with regulations should also be accompanied by every rights holder's belief that all others are complying with

the rules and laws, otherwise incentives for compliance decline. The belief that there is a high probability that any non-compliance can be detected, with very little chance of error, requires effective MCS.

All MCS options come with direct costs. On-board observing systems entail high direct costs, which increase with higher rates of coverage. However, observers, and especially high rates of observer coverage, help ensure the highest-quality data for scientific purposes. Some observers are only scientific, but other observers contribute to compliance through reporting of locations fished, fishing time, catch levels and species composition, fish age, gear type or method of fishing used, discards, high-grading, quota overages, bycatch, and other such aspects.

MCS underpins rights-based management, but rights-based management also facilitates MCS by establishing incentives for providing accurate and timely data and for compliance. Rights-based management provides positive economic incentives for rights holders to comply with requirements for providing data and with quota holdings (and sometimes bycatch), because actions taken that hurt the resource lower the value not only of other holders' rights, but also of one's own right. Thus rights-based management helps establish incentives for self-enforcement and self-compliance, both of which serve to reduce the MCS costs associated with command and control management. Countering this trend towards cost minimization of MCS with rights-based management is the increasing data and overall information requirement, although these costs tend to be increasingly borne by rights holders as the rights become more comprehensive. Although incentives grow for rights holders' responsibility in mutual enforcement and MCS activities, some activities are likely to continue to reside with the member state, since the property rights for the resource stock and area fished are retained by the state, and some functions are invariably retained by the management authority and the state. Ultimately, MCS requires some form of verifiable monitoring, auditing, and related activities external to the rights holders themselves. Transnational fisheries further require MCS and enforcement to deal with the threats from vessels outside the RFMO system *(i.e.* members and cooperating non-members).

A large set of MCS options are available, including a register of vessels, logbooks, Vessel Monitoring Systems (VMS), shore-side monitoring, observers, surveillance by patrol vessels and aircraft, at-sea boarding and inspection, on-board video monitoring, audits of company records, and catch and trade documentation. Vessel registers are perhaps the most fundamental requirement, although they can entail considerable time and expense to establish, maintain and keep current, especially in transnational fisheries. Register requirements, compliance, and maintenance differ considerably among RFMOs, and the Kobe process recommends harmonization of registers across RFMOs. Vessel logbooks provide records of catch, location and time, environmental conditions, and other information; they can be used for compliance and, in some instances, can provide scientists with detailed information. In the Pacific, logbooks are completed by all vessels in the IATTC area, but not always in the WCPFC area, except within EEZs. Electronic logbooks and real-time reporting can be used as an indication of whether or not a vessel is in an approved fishing zone and for near real-time monitoring, especially for quota fisheries. VMS monitors the location, timing, and movements of individual fishing vessels to ensure that there is no fishing in closed areas or during prohibited times, and that fish are caught where reported. VMS is currently used to track vessels electronically, and could be linked to electronic logbooks. VMS is centralized in the WCPFC; previously only in the Forum Fisheries Agency waters, but now this system has to be melded with the WCPFC system. In addition to public surveillance, vessel owners are interested in tracking their own vessels.

Shore-side monitoring after each fishing trip involves measuring fish, species composition, and length frequencies. It also verifies catches and provides basic reporting. Sampling problems can arise. Independence of the shore-side monitor and any on-board observer ensures there is no conflict of interest. In rights-based systems using quotas, fishers are required to call in their estimated catch, landing time, and port prior to arrival, which ensures that no fish are landed unmonitored. Advanced radar and navigation equipment increase the effectiveness of government or RFMO surveillance. Patrol vessels with high operating speeds act as a deterrent. Aircraft are less effective overall, except for monitoring closed

areas and times, although they can identify fishing vessels for closer inspection by patrol vessels. Independent observers and enforcement officials can use at-sea boarding from patrol vessels to examine catches in holds, fishing gear compliance, and other regulations. Currently, there are no at-sea boarding and inspection programs in the eastern Pacific, but there is agreement in the western and central Pacific that any qualified member in the convention area can board and inspect on the high seas, although not within any EEZ unless there is prior agreement. The landings of individual vessels or companies can be verified by a detailed audit of company financial records, thereby bringing to light discrepancies in catches and sales. On-board observers are used by the IATTC, which has a model system, based on the AIDCP, with one hundred percent coverage, although this is not strictly an IATTC requirement. As discussed above, observers can play both scientific and compliance roles, but minimizing the compliance role of observers is recommended because they are out at sea with fishers in a confined space for long periods of time. Once the actual on-board observing is completed, costs remain for debriefing, data compilation, and storage. An alternative to on-board observers is on-board video monitoring, with one or more cameras on the vessel. The cameras are sealed to prevent tampering, and programmed to automatically record when appropriate gear is used, and the recordings are subsequently removed and reviewed by the appropriate authority. While a cheaper alternative to on-board observers, video monitoring is less effective and generally provides only limited and specific information. Catch and trade documentation provide MCS functions for both sustainability purposes and for enforcement and compliance with quota management. Transnational tuna fisheries typically entail considerable international trade in fish, loins, and processed products, so accurate information on trade, with linkages to catches, help ensure MCS.

Trade measures, acting as a credible threat, are one of the few negative economic incentives available to enforce property rights, participation in (or cooperating with) RFMOs, and fishery conservation and management measures in general. The two basic trade measures are prohibition of imports and prohibition of landings; others measures concern port use, and transshipments from non-complying members and cooperating non-members of an RFMO and IUU fishers. Catch and trade documentation are fundamental to effective trade measures. For example, catches caught outside an RFMO area require documentation on where, when, and how the fish were caught, attested to by a state authority. Member states can prohibit imports or transshipments of member fish without proper catch documentation or from states whose ships have been deemed to be fishing outside the RFMO regulatory process. Questions arise, such as domestic enforcement of trade measures, the legality of some port state measures, such as the degree of control the port state can exercise over a vessel, falsification of information, difficulties of tracing fish from catch to market, consistency across RFMOs, and the legality of certain applications of trade measures.

## 3. SOME OPTIONS FOR RIGHTS-BASED MANAGEMENT SYSTEMS FOR INTERNATIONAL TUNA FISHERIES

A number of options for rights-based systems for the tuna fisheries in the eastern Pacific were discussed by the Workshop and compared with the *status quo*. These included universal ITQs, country allocations, and the use of a corporate structure owned by quota holders or governments. The latter arrangement could be developed in a number of ways, the key features being to internalize transaction costs and to separate property rights from management and harvesting rights. For the purposes of comparison, a particular corporate model was examined. Further work is needed to develop these models.

For the most part, the current management of the fishery by the IATTC leaves the right to catch fish as a common property enjoyed by fishers from the members or cooperating non-members. There are national annual allocations for bigeye tuna taken by longline, and fishing effort restrictions for purse-seine fishing. A complex property arrangement exists in the purse-seine fishery, where fishing is subject to limited entry controlled by the IATTC Regional Vessel Register, but purse-seine vessels may be removed from the Register by their government. Positions on the Register are transferable. Generally, management rules apply to the entire eastern Pacific Ocean, including waters under national jurisdiction, but closures of

relatively small areas for limited periods have been used to reduce catches of small tuna. The IATTC may set TACs, effort limits, and monitor catch and fishing effort against limits. It maintains the Regional Vessel Register, and operates a purse-seine observer program which monitors catches of target and associated species.

The IATTC members are responsible for making and implementing the Commission's decisions, implementing measures for their own public good within waters under national jurisdiction, and enforcement of all measures. Some members license foreign fishing vessels to fish within their zones under national jurisdiction.

The fishing industry participants are responsible for timely reporting of data to the IATTC or government and for compliance with IATTC rules, and have a management advisory role. As required, they pay licence fees for access to EEZs and/or country contributions to the IATTC.

The current system does not provide significant resource rents, which for the most part are generated by licence fees for access to EEZs.

### 3.1. Country allocations

In this case, the participating countries agree explicit shares in the use rights to the tuna stocks. These rights can be defined either as (i) a fraction of the total allowable catch, or (ii) a fraction of total permitted fleet capacity. It is then up to each country to decide how these rights are used by its own fishers or those whom it authorizes to use these rights. It is by now well established that improved economic benefits will be attained if a country's fishing quota is divided into shares that are allocated among its fishing companies and made transferable, so that those who are willing to pay most for these rights can obtain them from others who are willing to part with them. The more secure and better specified these rights, the greater the economic benefits that can be expected. For rights defined as shares in fleet capacity, there is less experience to count on.

Of these two options, catch quota allocation is usually preferred because it removes all incentives to race for catch. Catch quotas directly address the fundamental problem, which is limiting the total catch from a stock to what the stock will support, given the condition of the stock at the time and taking into account the effect of present catches on the future yield capacity of the stock. It must be stressed that the catch quota allocation method will only work well if the participating nations are willing to limit the total catch in the way described. There are many examples of the catch quota method achieving little or nothing because nations have papered over their differences by raising the total catch quota to a level that has accommodated their claims while being way beyond what the stocks are able to support.

Separate catch quotas must be set for each stock. In addition, it may be necessary to set specific quotas for specific gear types, because the catches taken in one fishery may eventually affect the catch possibilities in another. A case in point is the purse-seine fishery, which in some or most cases exploits tuna of young age groups which, if spared, would eventually become available to the longline fishery. It may be necessary to set total catch quotas for several fleets fishing the same stock, such as purse seining with FADs, purse seining on unassociated tunas, purse seining on tunas associated with dolphins, and longlining.

Partly because different TACs must be set for different fisheries, but also because of difficulties in monitoring catches, it may be preferable to limit the fishery by total fleet capacity instead of by catch quotas. Fleet capacity is easy to monitor, given that it has been defined in easily-observed units such as hold capacity. The problem with this method is that such definitions may have a tenuous relationship to the fishing power of the vessel and the amount of fish it can take at any given time. Furthermore, it gives incentives to circumvent such regulations by maximizing the fishing power of a vessel for any given definition of its capacity, as described in Section 2 on constraints. Fleet capacity regulation may be supplemented by regulating the intensity of use through maximum allowable fishing days, according to the condition of the fish stocks at any time.

### 3.2. Universal ITQs

Universal ITQs involve the setting of a total allowable catch, with rights to catch allocated to individual fishing enterprises. This implies that countries would agree to give up their right to control individual harvesting rights. The rights in the fishery would be shares (fractions) of the TAC, which would be owned as property in perpetuity or for a long period and would be freely tradeable. Each year a right would generate an annual catch entitlement (ACE) equal to the fraction of the TAC represented by the right. The rights in the fishery and the ACEs could be traded independently. The ACEs could be specified by gear type or method, to account for the different effects of fishing associated with each gear type; for example a share in the TAC may generate 3 tonnes of longline-caught tuna, but only 2 tonnes of tuna caught with purse seines. Spatial issues may be handled either by dividing the TAC or by qualifying ACEs. The system may include limits on quota aggregation and/or constraints on places where fish may be landed.

The IATTC would be responsible for setting TACs and any differential ACE rates, would provide services such as monitoring in the area via its observer program and port monitoring, collect most of data, and provide scientific advice.

The members would be responsible for the IATTC's decisions and for ensuring compliance by own flag vessels with management measures, and could implement additional measures within waters under their jurisdiction. In some cases members would collect and provide data to the IATTC.

The fishing industry participants would be responsible for timely data reporting to the IATTC or government, and compliance with rules of IATTC, and would have a management advisory role, particularly in respect of economically optimum TAC levels.

Resource rents, in whole or in part, would accrue to the members via mechanisms which might include quota auctions, landings levies, and quota rental charges.

### 3.3. TunaCorp

With this system, a corporation (TunaCorp) would be established, which would be owned by the members of the IATTC, with shareholdings in proportion to their ownership interest in the fisheries rights. Each year the countries would vest the catching rights (ACE) generated in TunaCorp, to be managed to maximum economic benefit. Country ACE allocations could be allocated in a variety of ways, and may be encumbered in accordance with the policies of the member whose rights they are associated with. Examples of encumbrances would be a requirement to land tuna in ports of a member, or limiting allocations to vessels flying the flag of a member. The system can use similar mechanisms to those of the universal ITQ system to address spatial issues.

As with the country model, the participating countries would agree explicit shares in the use rights to the tuna stocks. These shares would be the rights in the fishery expressed as a percentage of the TAC, which would be owned as property in perpetuity and would be freely tradeable. As with the Universal ITQ model, each year a right would generate an ACE equal to the fraction of the TAC represented by the right. The rights in the fishery and the ACEs could be traded independently, and could be specified by species, gear type, or other such qualifier, as required.

The IATTC members would have the same roles in setting the management framework as in the universal ITQ system and, in addition, they would, as the owners of TunaCorp, determine the distribution of resource rents. Management services could be delivered either by TunaCorp, member countries, or the IATTC, as appropriate. TunaCorp would, at the very least, generate and allocate ACEs, collect and distribute resource rents, allocate management costs, maintain catch and quota registers, balance catches against quotas, and, in some cases, apply penalties.

The fishing industry participants have similar responsibilities to those in the universal ITQ system, but in some cases their reporting would be to TunaCorp.

### 3.4. Pros and cons of the options

The limited-entry system of the IATTC is its main tool for stopping further over-capacity of the eastern Pacific Ocean fishing fleet. However, it is incomplete, as it addresses only purse-seining, and is subject to increases in actual effort via technological advances and further investment. Furthermore, the limit is much too high for the productive capacity of the stock. This incomplete definition (invariably the case for effort controls) and incompletely structured right leads to rent dissipation. The longline fishery is effectively controlled by country allocations of bigeye tuna, which provides the opportunity for countries to act to preserve rent, as discussed above.

The differing interests of the members of the IATTC, which mean that there are no incentives to ensure the conservation of all stocks, and the consensus decision-making system have put agreement on effective conservation programs out of reach in recent years, and preclude any management aimed at maximizing economic benefits. As a result, the only rents available in the fishery are obtained via the rights of countries to control access to their zones of national jurisdiction.

*Universal ITQs:* The advantages of the system of universal ITQs over the *status quo* include the incentives to reduce overcapacity over time and increase economic efficiency, and incentives for collective action, such as group enforcement, to maximise asset values.

Members are likely to see the reduction of their management control as a serious disadvantage, and this alone may be sufficient to make the system unacceptable. The monitoring and enforcement of the system would be much more expensive than the *status quo*, although, if properly managed, increased resource rents would more than compensate those costs. There may be legal challenges to establishing rights over what was previously common property. While current tendencies in international fisheries law make it reasonably likely that any such challenges would be defeated, the very novelty of the concept may itself provoke legal challenges, which may be seen as a potential transaction cost.

*Country allocation:* The country-specific allocation of quotas and fleet capacity is most likely to be the option acceptable to the countries involved at present and in the near future. It could, however, evolve into a supra-national approach if countries are prepared to see quota or fleet allocations migrate out of their jurisdictions, being instead satisfied with obtaining a share of the rents realized by the aggregate fishery. This could be accomplished by a fishing corporation in which individual countries held shares that gave them a share in the corporation's profit. This arrangement is further described in section 3.3 above.

However, because it only creates rights at the national level, it leaves the issue of optimal returns from the fishery dependent upon each member's internal management of catching rights. There is a risk of agency capture when state ownership is retained.

*TunaCorp:* The corporate model is extremely flexible, and can capture full ownership incentives, arrest overcapacity, provide opportunities for rationalisation, and allow for sharing of resource rents. It provides a clear role for members in managing fishing rights and in realizing a share of increased returns from the fishery. It also allows the possibility of partial gains, by having each country decide independently whether or not it wants to turn its country quota into ITQs and then allow trading.

As with the country allocation model, there is a risk of agency capture when state ownership is retained, but the arm's-length management arrangements may raise the level of transparency to reduce this risk. The industry ownership incentives are limited, although this could be addressed by allocating shares to industry or providing longer-term ACE allocations in partnership with country allocations. The option is subject to the same legal risks as the option of universal ITQs.

The Workshop participants were not in a position to compare the models, which were only developed in a preliminary way during the Workshop. However, they suggested that further work be put into developing the models and exposing them to discussion with a wide range of tuna fishery stakeholders.

## 4. FOLLOW-UP ACTIONS

The Workshop discussed a number of follow-up actions (listed below) that should be considered to advance the development of rights-based management systems in tuna fisheries.

1. Distribution of the Workshop Report to management agencies and organizations, with suggestions that the ideas it contains be considered at the next joint meeting of tuna organizations.
2. Development of a concrete example management system for tuna fisheries, involving the use of transferable quotas, that could be examined in detail at a future workshop.
3. An estimation of the economic case for rights-based management in the eastern Pacific, identifying the cost, the financial instruments that could be used, design of a buyback and management system, and the potential economic gain.
4. Political feasibility analysis for rights-based management of tuna fisheries.

Follow-up events during the next 12 months:

1. Engage IATTC member countries with 'idea products' of Workshop, including the economic case and rights-based management examples from 2 and 3 above.
2. Industry-oriented workshop, to be held in Central or South America, to examine the example management system from 2 above.
3. A workshop at the Graduate School of International Relations and Pacific Studies of the University of California at San Diego, focussing on fisheries in the eastern Pacific and in the western and central Pacific with involvement of Pacific Island countries.