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A Case for the Decentralization of Tuna Management: The East Pacific Tuna Fishery

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A CASE FOR THE DECENTRALIZATION OF TUNA MANAGEMENT: THE EAST PACIFIC TUNA FISHERY

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ABSTRACT

The east Pacific tuna fishery has been a highly controversial industry due to a variety of biological, economic and political factors. Tuna are a highly migratory species and are known to move across areas of the ocean that are claimed by different nations. The high economic value of the tuna fishery has enhanced the dispute over the positioning of many of these national boundaries. During the middle of the twentieth century international fishery organizations were created in an attempt to resolve many of the issues. The Inter-American Tropical Tuna Commission (IATTC) was created to make management recommendations to maintain the stocks of Yellowfin tuna at a maximum sustainable yield using scientific information. This paper analyzes the effectiveness of an international organization in managing the tuna fishery and compares the Commission with the more recent development of a decentralized policy structure and national jurisdiction over tuna.

The IATTC was largely unsuccessful in achieving its goal due to the structure of the organization and its lack of supranational authority. Recent events and UNCLOS III have given coastal states the authority to effectively manage and enforce the tuna fisheries of the east Pacific. The IATTC is still an effective and useful organization for the collection and analysis of fishery data.

International scientific organizations should be supported and isolated from the political structure. The subjective management decisions should be left with the individual governments using local industry participation. The scientific information needs to enter this decentralized policy process via an effective structure for data transfer.

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CHAPTER ONE

INTRODUCTION

Since the 1940's there has been a steady increase in fishing effort that has exceeded the capacity of many valuable stocks to renew themselves. In the early days of overfishing two types of management regimes arose to control this excess effort. In the 1940's coastal nations had narrow territorial seas and the vast majority of living resources existed beyond their jurisdiction in the High Seas. The first type of management consisted of international organizations (IO) which were created to manage shared stocks between member nations.

International organizations have traditionally been used to solve interstate problems that a sole nation cannot achieve on its own. The rapid progress in technology and communication in the twentieth century has increased the interdependence of sovereign nations. In addition, foreign affairs daily affect domestic policy and force nations to recognize the need to interact with the international community. Yet during this century there has also been a proliferation of new states as old empires crumbled and nations redefined their limits of jurisdiction and influence.

Nation states are by their very nature sovereign entities under international law with inherent rights to govern their own affairs and are not accountable to any higher jurisdictional authority. In many cases the participation by states in IO's was not out of any positive desire to join but a realization that they would be negatively impacted if they did not become a member. However, the dominant feature of many states is that they are unwilling to surrender or acquiesce any kind of

authority to a supranational organization. These two forces, desire to remain autonomous and need to maximize their own interest in the international community, act simultaneously and often to the detriment of the IO's in which they participate.

International fisheries organizations are a classic example of functional, intergovernmental organizations that have recently experienced widespread disintegration due to the dominance of nationalistic self-interest. As a result a second type of management regime also appeared during the second half of the twentieth century. Individual nations perceived they would best achieve their own fishery goals if they claimed exclusive authority over their own fishery resources. This involved an extension of national jurisdiction over coastal waters rather than participation in joint management.

The advantage of IOs was the ability to implement management measures over the entire range of the stock without artificial limits at national boundaries. However, at the same time many nations believed the IOs were ineffective due to lack of supranational authority and the inability to control the effort of nations that were not party to the organization. Coastal nations therefore began to claim larger areas of the oceans, contiguous to their shoreline, as under their jurisdiction. This "creeping jurisdiction" has brought many stocks of fish under national control. The result of this national expansion is a more efficient distribution of the costs and benefits of national fishing operations (Copes, 1981). Accountability and culpability for the status of the stocks has also been more clearly established with the 200 mile zones (Copes, 1981).

A major problem still exists with stocks of fish that cross these biologically artificial boundaries and therefore belong under different nation's jurisdiction at different times. Effective management of these transboundary species has to be implemented over the entire range of the stock in question. Thus there is an unavoidable need for international cooperation if there is a desire to manage the stocks "rationally." How the stocks are to be managed will vary according to the goals and objectives of each nation. What seems to be "rational" management for one nation may result in the defeat of another's objective.

Whatever the individual nation's policy may be, it has to have scientific information about the fishery on which to base its management objectives. The dominant part of this information has to be the status and dynamics of the stock itself. This type of information is needed by all states and even though it may be interpreted differently it is still of benefit to all parties. Due to the wide range of the resource it is often impractical for one nation to undertake the necessary research for the whole fishery. Thus a compelling argument still exists for the need of international organizations to either undertake the investigations or aggregate member nations scientific data for transboundary stocks.

Among the living resources of the coastal state tuna are the most complicated and difficult species to manage (Copes, 1987; Saila and Norton, 1974). Tuna are large, oceanic apex-predators that inhabit the vast areas of the open ocean and the study of their biology and life-history is logistically difficult and many basic scientific questions about their life history remain unanswered (Sund et al., 1981; Bardach, 1983). Tuna are mainly known for their long-distant migrations

that can involve passage through many different zones of national jurisdiction. Tuna are also a resource, highly valued by many coastal and distant water nations and are therefore particularly susceptible to maritime jurisdictional disputes.

The purpose of this paper is to determine whether an international organization or sole, coastal state jurisdiction is most effective in managing the eastern tropical Pacific tuna fishery. In order to reach this objective this paper undertakes two approaches. First, the past effectiveness of the eastern Pacific tuna international organization will be analyzed. The indices that are used to measure the effectiveness of the organization are, (a) the collection and analysis of scientific information concerning the tuna fishery, (b) the management recommendations of the organization and (c) the enforcement of the management recommendations.

The second aspect of the paper analyzes recent events that have given coastal nations sole rights and responsibilities for fish stocks within 200 miles of their coasts. Indices for effectiveness of this modern form of fishery management are, (a) the consequences of the new geographical extent of jurisdiction on the tuna fishery, (b) the effects on data collection and information transfer and (c) the effects of the new regime concerning management of highly migratory species.

Conclusions are presented that show the old form of an international organization is an effective structure for collecting and analyzing scientific information regarding the eastern Pacific Yellowfin tuna. However, effective management and enforcement of the fishery should remain with the coastal state in a decentralized structure with

active industry participation. Coastal states in the east Pacific should ultimately have the responsibility to manage Yellowfin tuna stocks within their Exclusive Economic Zones.

CHAPTER TWO

DESCRIPTION OF THE RESOURCE

Biology

The tuna fishery in the east Pacific is predominantly targeted on the Yellowfin and Skipjack tuna species. The descriptions of yellowfin and skipjack biology and distribution are based primarily on the reviews by Sund et al. (1981), Bardach (1983) and Bardach and Ridings (1985).

Tuna are large, oceanic, apex-predators that are widely distributed over the semi-tropical and tropical regions of the world's oceans. Yellowfin tuna are distributed across the eastern Pacific between the Latitudes of 23^{o}N and 23^{o}S in water temperature between 20 and 30^{o}C. They first mature after 3 years at 160 cm with one 10 year-old fish reaching a record size of 209 cm. Tagging data shows that Yellowfin and Skipjack tuna migrations are not as extensive as those of other tuna such as Bluefin. Yellowfin tuna are known to spawn primarily in the central and western Pacific with few larvae found in the eastern tropical Pacific.

Skipjack tuna are smaller than Yellowfin, reaching a size at first capture of 30-70 cm in their 2nd year of life. They can grow up to 100 cm after 12 years. They do not possess a swim-bladder and it is believed that the greater energy costs involved in constantly swimming limits their range to warmer latitudes. Skipjack are ubiquitous over the Pacific ocean and may be separated into at least five different spawning stocks. Tagging data has not been able to discern how much

intermixing exists between the populations of Skipjack but migrations across the Pacific have been reported.

The Tuna Industry

From 1950 to 1959 the catch of Yellowfin tuna in the eastern Pacific Ocean (within 200-300 miles of the shore) amounted to about 354 million pounds, worth approximately 50 million dollars to the fishermen (Joseph, 1970). During this period the tuna were mainly caught from baitfishing vessels that used pole-and-line fishing gear. By 1959 the technological advancements of the power block caused the far more efficient purse seiners to dominate the fleets by over 80 % (Joseph, 1970) whereas in 1955, 80 % of the catch was by pole-and-line vessels (Schaeffer, 1955).

Today there are eleven nations fishing in the ETP with approximately 67 percent of the vessels operating under Mexican and U.S. flags (IATTC, 1987). The United States was the greatest harvester in the 1960's accounting for over 90 % of the catch (Joseph, 1970). The U.S. fleet has been dramatically reduced from a high of 180 vessels down to only 34 in 1987 and only one processing plant was operating in the continental U.S. in 1985 at Terminal Island, CA (Herrick and Koplin, 1986). As a result the U.S. share of the tuna catch in the East Pacific has declined from over 90 % in the 1960's to below 50 % in 1981 while Latin American nations have increased their share to about 35 % (Joseph, 1983a). Declining catches, increased foreign competition and overcapitalization in boats, plants and inventories during a period of high interest rates are only some of the reasons for the decline in the

U.S. tuna industry (Herrick and Koplin, 1986). The U.S. tuna industry has also declined due to the direct effects of U.S. and foreign tuna policy. Many U.S. tuna vessels have changed flags in order to avoid the restrictive U.S. legislation on the porpoise by-catch. Other vessels have left the industry completely due to the continuing legal dispute over national versus international jurisdiction over tuna. The U.S. is the sole nation that maintains tuna can only be managed effectively through an international organization due to its highly migratory nature.

In 1981, 72 % of the world catch of tuna came from the Pacific Ocean with a value of $1.6-1.7 billion (Bardach and Ridings, 1985). The United States and Japan took over 65 % of the catch from amongst a total of 30 participating nations. In the east Pacific the catch is mainly targeted on the more profitable Yellowfin tuna whereas in the west Pacific the catch is primarily on the Skipjack (Bardach and Ridings, 1985).

From 1966 to 1981 the stocks of Yellowfin have shown a gradual decline but because of favorable 'El Nino' conditions and dislocation of fishing effort the stocks have recovered to about 80 % of their levels in 1968 (Steiner et al., 1988). The recent reappearance of large yellowfin tuna in the east Pacific has prompted returned fishing effort and stimulated U.S. exports to European markets where the tuna fetch a premium price (Herrick and Koplin, 1986).

Yellowfin tuna was the most important component of the total catch in the ETP in 1985 and 1986 comprising over 78 % of the catch for both years (IATTC, 1987). The recent reappearance of large yellowfin tuna in

the east Pacific has prompted returned fishing effort and stimulated U.S. exports to European markets where the tuna fetch a premium price (Herrick and Koplin, 1986). At present 8.2 % of the yellowfin sold on the world market come from the eastern tropical Pacific (Steiner et al., 1988).

During the 1970's foreign distant water fleets were moving further westward into the High Seas and the west Pacific due to the declining catches in the east Pacific region and problems with expanding state jurisdiction. In 1981 the catch of skipjack in the Pacific was about 56,000 mt yielding 80 % of the world catch for this species and comprised the 13th largest catch of any species in the world (Bardach and Ridings, 1985). In addition the total skipjack biomass in the entire pacific is estimated to be as high as 10 million mt while its oceanwide MSY is estimated to be at 2-3 million mt (Bardach and Ridings, 1985).

As a result of the high price of tuna and its fluctuating abundance the tuna fishery is highly volatile and controversial industry. However much of the controversy extends beyond the value of the resource itself to how the benefits should be equitably allocated. Issues of foreign access to coastal waters, rich in tuna, are problematic due to the sensitive nature of the political relations between the harvesting and the Resource Adjacent Nation (RAN). Many of the RANs are underdeveloped nations that perceive the harvesting of tuna, within 200 miles of their shores, as a continuing example of the developed world's exploitation and abuse of their natural resources. Consequently the dispute over

access rights to tuna has extensive political and emotional ramifications as well as large economic significance.

CHAPTER THREE

EVOLUTION OF AUTHORITY TO MANAGE THE FISHERY

After World War II it became obvious that many fish stocks of the world's oceans were being heavily, and in some cases, over-exploited by national and foreign fishing fleets. It became apparent that in order to prevent "the tragedy of the commons" (Hardin, 1969) many fish stocks now needed to be managed. In order for a fisheries management organization to be successful it must have a clear mandate under national or international law for jurisdiction over the geographical area of the fishery and a respected authority by all concerned parties.

The Truman Proclamation

The United States Truman Proclamation in 1945 (Presidental Proclamation, 1945a) was one of the first unilateral claims of jurisdiction over its fisheries contiguous to its coast. It was an attempt to define "conservation areas" where management of the resources would prevent overutilization (Rasmussen, 1981). The "areas" would only be established with the agreement and cooperation of affected foreign states. In return, the Proclamation conceded the right for any other state to establish similar conservation zones on the condition that "corresponding recognition is given to any fishing interests of nationals of the U.S. which may exist in such areas" (Presidental Proclamation, 1945a). This reciprocal provision was included in order

to protect the interests of the U.S. tuna fishermen who fished off the shores of South America (O'Malley Wade, 1986).

At the same time as the fisheries Proclamation the U.S. announced its intention in a separate Proclamation to expand its jurisdiction over the non-living resources of the continental shelf (Presidental Proclamation, 1945b). This Proclamation was also carefully worded so as not to imply any expanded jurisdiction over the water column above the seabed.

The U.S. intended these two separate Presidential claims to preserve traditional high seas freedoms beyond the territorial sea. Despite the best efforts of the U.S., the Proclamations were treated as one and interpreted by the Latin American States as an extension of exclusive U.S. sovereignty over all living resources over the U.S. continental shelf (Healey, 1981).

Declaration of Santiago

Soon after the Truman Proclamations, Chile and Peru declared exclusive control over 200 mile zones in 1947 although the exact extent of their claims were vague and ambiguous (Kent, 1972). The Latin American states were concerned that the living resources off their coasts would be vulnerable to U.S. exploitation, unless they also established extended jurisdictional zones. In the 1940's, 95% of tuna used by the California processors came from waters off Mexico (Wolff, 1980).

The Declaration of Santiago in 1952 between Chile, Ecuador and Peru claimed exclusive sovereignty over all ocean areas within 200 miles of

their coasts including tuna. The United States immediately objected to this Declaration and has consistently claimed that tuna can only be effectively managed by an international organization due to their highly migratory behavior (Joseph, 1970, 1983; Rose, 1974). United States policy has also been based on protecting the interests of its distant-water fleet based in California. The U.S. tuna fleet harvests the majority of the U.S. production from the Pacific Ocean (Herrick and Koplin, 1985). The U.S. clearly recognized that expanded coastal state sovereignty would be of detriment to the US tuna industry. An IO with U.S. participation and control would give the U.S. greater influence over the fishery in contrast to unrestricted foreign expansion. In addition the United States foreign assistance could be made conditional on compliance with the recommendations of the IATTC (Rose, 1974).

In the early 1940's the U.S. tuna fishing industry was in direct conflict with the Costa Rican shore-based processors (O'Malley Wade, 1986). Subsequently the U.S. defended its interests by persuading Costa Rica that a system of international control of tuna, was a more effective system of management than extended jurisdictional claims. Even with extended jurisdiction over 200 miles it was maintained that stocks of tuna would still move between coastal state's zones and, therefore, only give a coastal state partial control of the resource. A joint-management body would be able to have control over the resource throughout the extent of its range. Accordingly, on May 31, 1949, the U.S. and Costa Rica signed the Convention for the Establishment of the Inter-American Tropical Tuna Commission (IATTC, See Appendix 1), which entered into force on March 3, 1950 (IATTC, 1949).

CHAPTER FOUR

THE INTER-AMERICAN TROPICAL TUNA COMMISSION

Membership

All states whose nationals participate in the tuna fishery can become members of the Commission after receiving unanimous consent from all members (Article V(3)). The IATTC is headquartered in La Jolla, CA, and is largely U.S. staffed (Gulland, 1984). States that had joined the U.S. and Costa Rica in the Commission are Panama, 1953; Ecuador, 1961; Mexico, 1964; Canada; 1968; Japan, 1970; France; 1973 and Nicaragua, 1973 (Bayliff, 1975). Ecuador withdrew from the Commission in 1968, as did Mexico in 1978, Costa Rica in 1979 and Canada in 1984 (Peterson and Bayliff, 1985).

The fundamental problem with IOs is the "free rider" principle. If a group of nations decide to collaborate, restrict their harvest and share their information in order for the resource to recover, then a non-member nation can reap the benefits to the demise of the resource and the other members. This is due to the voluntary nature of the membership requirement. In order for an IO, such as the IATTC, to be effective, all nations that participate in the industry or own the resource must cooperate in order for the management scheme to work. The larger the group of nations involved the more difficult it will be to achieve full cooperation.

Each member nation can have up to four commissioners, appointed by their respective government, serve on the IATTC. Non-member nations who

have an interest in the fishery can be represented with non-voting observer status (Rose, 1974). Each year the commissioners select one of their body to serve as the Chairman and another, from a different nation, to serve as the secretary of the Commission. The duties of the head officials are limited to maintaining order in the administration of the Commission and counting of votes. The Commission appoints a Director of Investigations who is responsible for the technical and administrative work of the Commission. The Director carries out the duties of the Commission with the aid of an internationally-recruited staff of scientists and administrators that he selects (Peterson and Bayliff, 1985).

Each national section has one vote and official actions of the Commission require unanimous votes (Article I(8)). The disadvantage with unanimous voting is that for full participation, one will frequently arrive at the lowest common denominator or least effective conservation measure, to achieve the agreement of all members.

Source of Funding

The Convention states that each state is to pay a proportion of the total expenses related to the "proportion of the total catch....utilized by that High Contracting Party" (Article 1(3)). The term utilization does not just mean the amount of fish harvested by the nation. Rather the distribution of payments is based on the amount of tuna the nation consumes or "substantially processes" regardless of the source of fish or the destination of the processed product (Bayliff, 1975). The result is that the United States pays over 99 % of the budget for the

commission (Bayliff, 1975). In 1987 the U.S. contributed $2,648,000 out of a total amount of $2,768,000 (IATTC, 1987).

There is a divergence of opinion as to whether the amount of funding for the IATTC was sufficient to fulfill its objectives. Relative to other regional organizations the IATTC has been considered as a well funded organization and this is probably the main reason for the success of its scientific endeavors (Healey, 1981). However the Commission has always viewed itself as short of funds (Koers, 1973) and most of the recent oceanographic research has been paid for by grants and contracts (Bayliff, 1975).

The IATTC scientific staff were concerned that not enough data collection was possible due to the lack of funds (Rose, 1974; Chapman, 1970). The scientists concern is based on the traditional belief that management measures must be based on the best scientific information available. However when dealing with uncertainty in a natural fishery there will always be questions raised and risks taken with incomplete knowledge. Scientists maintain that increased funding will alleviate much of this uncertainty by starting new programs and experiments to address the raised questions. Yet fishery managers have to make their decisions with incomplete information and limited resources. How much information is enough information will depend on the viewpoints of the scientists and the decision makers.

The IATTC and international organizations in general, are dependent on their member nations for financial support. The IOs have few means of independent support, apart from a few research grants, and are therefore seen as being at the mercy of the governments of the member

nations. If a member nation does not like the actions of the commission then reduced funding is an effective means of reducing the organization's ability to operate.

In this respect an IO is an extremely vulnerable and fragile structure for fisheries management. It seems that with the inherent biological complexity of a fishery and the unique difficulties of tuna management, a tuna management organization must be as robust as possible to external financial pressures in order to effectively manage the fishery.

CHAPTER FIVE

REASONS FOR INTERNATIONAL COOPERATION

The east Pacific tuna fishery involves a very valuable resource and a multitude of different nations with competing interests and objectives. James Joseph, Director of Investigations for the IATTC has consistently argued in favor of IOs such as the IATTC due to the need to achieve cooperation rather than conflict between these competing nations (Joseph, 1983a, 1977, 1970). Understanding of multispecies interactions (Kumes, 1983), resolution of gear conflicts (Healey, 1981) and timely information transfer (Joseph, 1983a) are just some of the technical and scientific areas that have been proposed as reasons for international cooperation. It certainly seems appropriate for underdeveloped nations, without extensive research capabilities, to combine their available resources.

In addition to collecting basic data about the resource, effective collaboration will also help with enforcement of conservation regulations and allocation of quotas. However, this theory for the need for effective collaboration is based on the assumption that each member nation of the IO has "rationally" decided in favor of long term management of the resource in order to gain the maximum benefit. It is quite possible that each member nation has different objectives for its tuna fishery. Rational management may therefore mean very different strategies for different nations.

It is possible that these reasons for collaboration, namely; data collection, management and enforcement, may not necessarily be best achieved by the same IO or even an IO responsibility at all. An analysis of the effectiveness of the IATTC in meeting these goals is discussed below.

Data Collection

The Commission's scientific staff has been widely recognized as a highly competent body of scientists who have successfully collected and performed the necessary research into the east Pacific tuna fishery (Koers, 1973; Chapman, 1970). As a result of these investigations, catch levels have been restricted by the IATTC. These actions have been at least partially responsible for maintaining a high tuna stock abundance in the eastern tuna fishery (King, 1979).

Fishery scientists face many problems when investigating the size and dynamics of a fish stock due to the inherent uncertainty of the fishery system. Populations of fish fluctuate over time and space due to a multitude of variables that are predominantly stochastic in nature (Sissenwine, 1984). Environmental as well as biological effects can drastically alter the size of the stock and hence the available amount for harvesting by fishermen. The effects of environmental factors on tuna spawning success and subsequent year class strength are virtually unknown (Sund et al. 1981). The Commission has been actively involved in oceanographic and meterological assessments in order to determine the effects of fishing versus the environment on stock abundance (Peterson and Bayliff, 1985).

The Convention states in Article II(1) that the Commission is to undertake scientific investigations on the biology and population dynamics of the Yellowfin and Skipjack tuna in the eastern Pacific Ocean as well as the fisheries that are used for bait. The commission's work on the bait fishery was terminated after 1961 due to the conversion of the baitboats to the more efficient purse-seiners (Peterson and Bayliff, 1985).

The Commission collects most of its data from canneries, longline catch data from the Japanese government and logbooks of over 90 % of the tuna fishing boats in the east Pacific (Peterson and Bayliff, 1985). Data for individual vessels or companies are kept confidential and only information on the location of the vessel, the number and times of sets and the catch of each species is recorded from the log-books. The collection of this data requires constant communication with the industry and an efficient form of data processing which is carried out at the IATTC headquarters in San Diego, CA.

Role of science in public policy

The structural interaction of science, fishery managers and the political decision makers is a highly controversial subject. In theory it has been recognized that if science is to be done objectively and effectively it must be free of national or political constraints.

Decisions involving scientific information may ignore the information if the data is sparse or known to be inaccurate. In the case of the International Commission for the Conservation of Atlantic Tuna (ICCAT) scientific recommendations for catch quotas were totally

different depending on whether there was one or two stocks of bluefin tuna in the Atlantic Ocean (Hoover, 1983). The lack of certainty seriously undermined the effectiveness and credibility of the scientific recommendations and political factors became dominant in resolving the problem.

In general, however, the intrusion of politics into science can have devastating consequences. In the case of the Pacific salmon fishery, biological teams of scientists were told by the Californian legislature to produce only those recommendations that were politically viable. When the scientific team did produce a management resolution that was unpopular with the politicians, the legislators called for the resignation of the entire team (Fraidenburg and Lincoln, 1985).

Ideally the scientists are trained to objectively collect and analyze data and present the results to the decision-makers. The elected officials then use the results to make informed decisions and create public policy. The problems occur when an independent scientific body attempts to turn its recommendations into public policy or public officials make decisions without reviewing or understanding the relevant scientific information. The problem stems from the differences between the two disciplines, namely the education and experience of the scientists and politicians. In order to make well informed decisions it is vital to bridge the gap between the two disciplines.

At the level of international organizations this problem of effective information transfer is even greater due to the multitude of political forces and national goals. Transfer of scientific information in any fishery organization is a high priority for effective political

decisions and structures must be implemented to facilitate such communication (Loftus, 1987). Gulland and Boerema (1973) suggest a two part process. First a management body will use all relevant information, including but not limited to biological science, to determine the general policy to achieve the physical yield from a fishery stock. This general policy may well include maintenance of a domestic fleet and a way-of-life or increased employment. This type of decision involves social values that are beyond the analytical ability of biological scientists.

Pure, objective science is concerned with the second step, by specifically determining the procedure to be followed to catch the amount of fish and implement the chosen policy. This may involve specific technological decisions such as number of fishing boats or amount of total fishing effort.

The experience of the IATTC exemplifies an opposite procedure. The scientific body determined the amount of fish available and recommended, on purely scientific terms, the amount of fish to be caught. The Commission then took this base of solely biological information and argued over the modifying political and socio-economic factors.

The point of entry of science into the decision-making process is not in itself of any major significance. However it is important that it is not corrupted by either the decision-makers or with values that the scientists have incorporated and are unable to analyze. In the case of the Californian salmon fishery, pure objective scientific information was ment to initiate the process and the legislators would make the final decision on the allowable amount of fishing effort using all other

factors. This process resembles that of the IATTC but the CA legislators had already corrupted the system by only asking for politically viable recommendations. In other words the legislators were asking the scientists to make value judgments that are only appropriate in the political arena.

Scientific information plays a greater role in the formation of policy in the latter IATTC procedure. In the former role the scientific body is simply helping execute an already decided policy. In order to decide which process is most effective one needs to measure the status and success of the fishermen as well as the size of the fish stock. If a large data base on the fishery has already been collected, and it is only political issues concerning the welfare of the fishermen that are at stake, then science should be removed from the decision process. Science should simply be left as an advisor for any necessary biological information and as an executor of the decided policy.

In contrast, in the case of the IATTC there was initially very little information available about the status of the fishery. The objectives of the IATTC were to conduct scientific investigations and base any management recommendations on these findings. Gradually as the data base increased it became apparent that overfishing was taking place. At this point the IATTC had to resolve allocation and equity issues rather than scientific problems. This evolution involved a greater role for value judgments and political techniques rather than scientific questions and analyzes. To achieve these new goals a different policy process was now necessary due to the nature of the political rather than the scientific problem. Scientific information

became a secondary concern and less important in creating a policy decision.

Thus over time the IATTC evolved through both extremes of the role of science in deciding policy. At the beginning science played a dominant part but eventually had a much more secondary role. However the goals of the Convention for the IATTC remained the same throughout this evolution.

There is an inherent inertia in all bureaucratic organizations that does not facilitate rapid transformations of structure or policy. In the case of the IATTC it would have taken a major rewriting of the original convention to give the commission a new set of objectives that reflected the changing importance of scientific information. Only now, with the collapse of the IATTC, is the change from a purely scientific organization to more of a management body beginning and it is discussed further below.

Fisheries Management

Fisheries management is a highly complex system that depends on a thorough analysis of many fields of study if its administration is to be successful. There are always a multitude of problems and few easy answers. Simple solutions inevitably fail to take into account long-term consequences and can often fail even when they are logically sound or make sense from the perspective of one viewpoint. This is mainly because of the nature of the resource and the host of competing objectives from the different interest groups. Two basic questions must

be addressed during discussions of fisheries management. First, why manage the resource and second how to manage the resource.

Marine fish stocks are only one of many of the world's renewable living resources, but differ from almost all other forms of agriculture because there are no well defined property rights for its ownership and harvesting. Ocean and coastal fish stocks have been classified as a common property resource that are res nullius and are therefore available for anyone that wishes to harvest them. If the size of the fish stock is large enough, relative to the harvesting pressure, then the resource will be able to renew itself and there will be enough fish for everyone. However as the harvesting pressure grows beyond the limits of the resource then the stock will eventually be fished to commercial extinction to the detriment of all user groups. This "tragedy of the commons" can only be avoided if the fishermen agree to mutual coercion and self-imposed restrictions on their behavior towards the resource.

This role of mutual coercion for a public property resource has historically been designated to the appropriate governance body for the user groups. Public goods do not apply themselves to ordinary economic market theory and if the resource is to survive and flourish with large exploitation then it must be managed by the public through a regulatory authority. Regulations that restrict the behavior of fishermen are the prime methods of managing a fishery. Yet it is not sufficient to invoke the "public interest" as the reason for regulating a fishery. Only when the "tragedy of the commons" begins can the government justify its laws and regulations.

Even this is not a sufficient answer as many of the users will have different determinations of when the "commons" needs to be managed. Often low stocks result in an increase in their value due to constant or steady demand and thus fishermen are reluctant to comply with regulations that restrict their effort and catch.

Only since the mid-twentieth century have the fishermen felt the need to be regulated due to the declining profits from over-exploited fisheries. In many cases it is clear that the stock is in jeopardy of being overfished and the fishermen are not making a good return on their investment in the fishery. At this point it becomes clear that some type of management is necessary and the question becomes how to do it.

How to manage a fishery is a very difficult task due to the competing and often contradictory objectives of the fishermen and the managers. Classical fisheries management is at its simplest when confined to a single stock, with an extensive understanding of its biology, in the jurisdiction of one country and harvested by a homogenous user group targeting only that species (Copes, 1987). The management of the eastern tropical Pacific (ETP) tuna fishery meets none of these criteria. At least two species of major commercial value intermix in the ETP with an unknown number of stocks of each species. Scientific investigations have extensively studied the fishery but many basic problems still exist about migration routes and environmental interactions. Tuna are highly migratory and are thought to move frequently between different zones of national jurisdiction as well as in and out of the High Seas. Finally many different types of gear are

used by the fishermen in different areas and from different nations, all with different objectives.

The creation of the IATTC is unique in that during the 1940's there were no visible signs of overfishing of the valuable Yellowfin stocks. The IATTC was created, in part, to prevent this situation arising before the problems of overfishing had become too severe. The objective of the IATTC is to determine the Average Maximum Sustainable Yield (AMSY) and thereby prevent overfishing. The methods of data collection and uses of the data by the Commission have been discussed above. The types and effectiveness of the management recommendations, that resulted from this data, are discussed below.

IATTC management recommendations

The first signs of overfishing for Yellowfin in the East Pacific started appearing in the early 1960's. The IATTC decided in 1962 to designate a specified area called the Commission's Yellowfin Regulatory Area (CYRA) (See Appendix 2). The need to define a specific area for IATTC authority was only established after the first recommendation of regulation of the Yellowfin fishery in 1961 (Peterson and Bayliff, 1985).

The IATTC has been far less successful in maintaining a joint-management structure than collecting the original data. The IATTC data base was good enough to conclusively show that overfishing rather than natural and environmental effects were the cause for the decline in yellowfin stock abundance. The same type of data also showed that there

were no similar effects on the skipjack populations so no management measures were deemed necessary (Joseph, 1970).

In order to regulate the fishery the Commission decided on annual catch quotas on a competitive "first-come first-served" basis without attempting to divide the catch further amongst the different nations (Rose, 1974). A single annual catch quota is a traditional management tool that was used by the IATTC because it "is the most effective and practical type of regulation" (IATTC, 1961). When the quota was reached, the Director of Investigations would recommend a closure date (Rose, 1974). However there are a number of major problems with catch quotas in general and specifically in the east Pacific.

When a quota has been reached under the basis of "first-come first-serve" the fishery will have to be closed to the detriment of those members unable to race to the fishing grounds. This can cause severe economic hardship on those members that were unable to harvest enough fish to reach their break-even point. In the case of the ETP tuna fishery there are also a number of enforcement problems, First, all states will have to individually prevent their citizens from fishing at the same time. If one or more nations continue to harvest then severe discrimination problems will arise. Second, the tuna migrate beyond the range of the CYRA and after the closed season fishermen can still catch tuna outside of the CYRA. Without precise information of the location of the catch it is impossible to prevent the tuna from being landed and sold. The enforcement issues are discussed further below.

Catch quotas, rather than effort restriction, depend on accurate stock assessments in order to achieve the Maximum Sustainable Yield

(MSY) (Sissenwine, 1984). Sissenwine (1984) suggests that fishery managers must use techniques that recognize the inherent uncertainty in the system and not rely on regulatory methods that depend on precise estimates of stock abundance. Fishery managers frequently use catch quotas to regulate a fishery but methods such as effort regulation are far less dependant on certain information about the size of population (Sissenwine, 1984).

The established quotas from 1970 to 1976 are a good example of the uncertainty in predicting stock size. In 1970 the IATTC predicted an optimum level of effort at 20,000 standard days and that the stocks would crash if effort were to increase to 45,000 days. The estimated MSY was 100,000 tons. In 1976 the Commission estimated that 40-50,000 days was the optimum level of effort and would yield 160,000 tons (Gulland, 1978). It is possible that the stocks made an enormous recovery from 1970-1976 but it does lead to speculation as to the desirability of quotas as a management tool for this fishery.

It is interesting to compare an independent scientific body, such as in the IATTC, with a politically integrated scientific group such as the ICCAT (International Commission for the Conservation of Atlantic Tuna). Joseph (1977) argues for the IATTC by stating that an independent scientific group will have clearer responsibility than that in the ICCAT, there will be fewer constraints from national policy, independent scientists have greater credibility, independent commissions can provide assistance to governments and the IATTC has been more successful in managing the stocks. As the above observations and

Gulland (1978) clearly show, the record of the IATTC clearly does not substantiate Joseph's arguments.

The quota recommendations were announced by the commission in 1961 but the countries did not implement these recommendations until 1966 (Peterson and Bayliff, 1985). Quotas were continued until 1979 but finally discontinued due to lack of member support. Part of the reason for this lack of support was because during this time frame many of the Resource Adjacent Nations (RAN) nations were developing their own tuna fleets (Joseph, 1983a) and coastal states were claiming jurisdiction over the tuna resource within their 200 mile zones.

Instead of abandoning the IATTC completely the RANs began to argue over the quota system and it became subject to many special exceptions that seriously reduced its effectiveness. These exceptions included a 15 % by-catch provision for yellowfin caught after the closed season when targeting a different species and small boats and "needy canneries" were allowed to continue to harvest and process tuna after the closed season (Rose, 1974). Experimental areas were added onto the management area and open to unlimited fishing in order to determine stock abundance beyond the western boundaries (Peterson and Bayliff, 1985). The IATTC had to agree to these exceptions if it was to maintain RAN membership. The RANs were able to politically influence the IATTC recommendations for their own purposes to the detriment of the organization's original functions.

The last allocation of quotas was attempted in the late 1970's on the basis of economic need and adjacency (Joseph, 1977). This trend illustrates the global shift in fisheries management emphasis from the

concept of a Maximum Sustainable Yield (MSY) to Optimum Yield (OY). Up until the mid-1970's MSY was used as a quantitative means of establishing a scientific basis of fishing effort and amount of fish harvested. The incorporation of other ecological and socioeconomic variables into MSY has been termed OY which is a subjective and maybe more realistic means for managing all aspects of a fishing industry (Fricke, 1985). However it is now difficult if not impossible to determine if the goal of OY is being achieved as it will depend on which goal one is attempting to achieve. Economic, sociological, biological and political objectives are rarely in harmony and will often be contradictory.

Agreement on the level of quotas is believed to be more easily achieved if determined by objective scientific criteria only (Gulland and Boerema, 1973) yet the very nature of OY involves compromises between interest groups and encourages political influence into the management process. As a result of the quotas the open season to catch yellowfin tuna has become shorter and shorter and has led to serious economic and political difficulties (Rose, 1974).

Overcapitalization has resulted from the short seasons and less efficient member states, such as Mexico, were unable to harvest their traditional catch (Koers, 1973). Problems with uneven enforcement of the catch quotas and different philosophies over jurisdiction of the tuna resource further aggravated the problem of quota management and allocation.

While regulating the Yellowfin fishery, the IATTC has also been indirectly involved in the management of associated species. The

Commission has simultaneously attempted to stimulate the skipjack fishery while restricting the harvest of yellowfin. This has been difficult as many fishermen cannot distinguish between the two species (Koers, 1973) and often the schools of different species of tuna intermix. Fortunately tuna species are known to only prey upon a few species of little direct commercial value so there are no other interactions to build into the fishery models (Hida, 1973).

The IATTC has also become increasingly involved in the porpoise tuna interaction. In the east Pacific tuna fishery, porpoises are known to herd above schools of yellowfin tuna. Fishermen use the porpoises as cues for setting their nets and frequently kill a large number of porpoises in the process. The IATTC has been active in training non-US personnel in dolphin-saving techniques and has assisted in alternative forms of setting on the tuna schools to avoid dolphin mortality (Steiner et al., 1988). The problems with the dolphin-tuna interaction generate highly emotional controversy. This issue is beyond the scope of science and the IATTC to come up with a solution. If the by-catch is to be reduced it will have to be checked by the fishermen themselves and from national legislation. So far only the United States has strict legislation requiring their fishermen to reduce the by-catch of porpoises.

Enforcement of Fishery Regulations

The role of enforcement is a much understudied and frequently neglected aspect of fisheries management. During the period of governance by the IATTC matters deteriorated to such a great extent that

coastal states took it upon themselves to enforce their goals and unilateral regulations with armed force. The "Tuna War" is an ugly example of an extreme form of enforcement and breakdown of international cooperation. Membership in the IATTC was purely voluntary and the IATTC was unable to enforce its recommendations on its member states.

Compliance with the IATTC regulations is the next obvious step to ensure that the benefits of the management efforts are to be realized. Compliance with the regulations is basically a matter of choice on the part of the fishermen (Hennessey and Sutinen, 1987). Sociological information is important in the management of a fishery resource both before and after the implementation of management measures (Fricke, 1985). If the fishery regulations are tailored to take into account the different interests of all the user groups then one increases the probability of compliance (Fricke, 1985). Continuous monitoring of the groups will help determine the consequences of the regulations and assist in any necessary amendments.

The regulations are attempting to change the fishermens' behavior and it is up to the fishermen to decide whether he will comply or not. His choice is based on a number of factors that follow sequentially from the moment he decides to violate the regulation. First, the fisherman must evaluate the chance that he will go undetected; second, determine the probability that sanctions will not follow; third, determine the time interval between time of detection and the assignment of the sanction and fourth, the size of the sanction (Hennessey and Sutinen, 1987). During the course of this decision-making process the fisherman

is not only determining the amount of cost at each step but evaluating the associated benefits.

It is paramount, therefore to have the views and interests of the fishermen expressed in the management structure. If they do not believe in the regulations or had no part in their formulation then most management techniques are destined for failure before they have started. There will be low compliance and enforcement costs will be very high. Also the history of existing IOs, such as the IATTC, has shown that the separation of power to formulate conservation measures, from the power to enforce them, has led to inefficient regulations over the resource (Healey, 1981). The structure of the IATTC is so far removed from the day-to-day lives of the majority of the fishermen that they have few means of direct input.

The weak organizational structure of the IATTC is reflected in the requirement of a unanimous vote to carry conservation recommendations. It is one problem to manage a group of fishermen from the same nation but to get consensus from a group of nations, represented by state diplomats, is a much more formidable task. However the mere existence of an international commission can have an effect on enforcement. The number of infractions will decrease if the fishermen are all of the opinion that the regulations are fair and equitable (Koers, 1970a). Some type of forum is preferable to a free-for-all where individuals do not even know each other or understand their different interests.

During the initial period of the IATTC the vast majority of world fishing took place outside of national jurisdiction. In order to prevent overfishing of stocks beyond territorial limits the emphasis was

on national enforcement of regulations devised and agreed upon within the context of international commissions (Carodsa, 1978).

Enforcement in an international fishery is a sensitive and emotional question that can easily cause international conflict as seen in the "Tuna War" in the east Pacific. Enforcement agents in an international fishery must not only be a policeman but a biologist, a lawyer, a diplomat and a seaman, all rolled into one (Cardosa, 1978). The power and effectiveness of enforcement ultimately rests on the security of the authority of the enforcer based upon recognized jurisdiction over the geographic area in question. Different types of enforcement exist that demand different types of jurisdictional authority.

International law has long differentiated between "prescriptive" jurisdiction - the capacity of a state to make valid rules and regulations, and "enforcement" jurisdiction - the capacity of the state to apply coercive processes to ensure compliance with its law (Bilder, 1973). In addition the concept of enforcement jurisdiction comprises a variety of different procedures ranging from the right to investigate a possible violation to the right to apprehend the violator and extract sanctions or fines (Bilder, 1973).

A system of enforcement can be judged according to two fundamental criteria, first whether or not it is effective and second whether or not it applies in a non-discriminatory way (Koers, 1970b). Comparing systems of national versus mutual enforcement it has been argued that mutual enforcement is preferable with regard to achieving the above criteria (Koers, 1970b). International enforcement by a third party

would be even more preferable in achieving the goal of non-discrimination but this avenue is not viable due to the unwillingness of states to transfer any authority in the field of enforcement to a supranational organization (Koers, 1970a).

Enforcement of the East Pacific tuna fishery

The IATTC has experienced the same problems as all International Organizations with the unwillingness of coastal states to submit to a supranational authority. Thus the IATTC never had any authority to enforce compliance with its regulations. Membership was purely voluntary and member states enforced the IATTC regulations on their own flag vessels. In some cases International Organizations have used methods of mutual enforcement or even been given the power to enforce their own regulations although the flag state still has the exclusive jurisdiction for the prosecution of infractions (Koers, 1973).

States not party to the IATTC had no reason to comply with its recommendations. After the Truman Proclamation, Chile, Ecuador and Peru (CEP) declared control over 200 mile zones with the Declaration of Santiago. U.S. Tuna vessels had fished within 200 miles of the CEP coasts without incident but in 1947 Peru started the Tuna war by seizing an American boat (Wolff, 1980).

The Latin American actions were an extreme form of enforcement designed to show their determination to establish their zones as a form of customary law. For this evolution to be effective, in the eyes of the international community, the state has to not only make the claim but also received the acquiescence of foreign states. The United States

refused to acquiesce and U.S. vessels continued to fish for tuna within 200 miles of the CEP coasts. The conflicts continued and by 1954 Latin American states had seized up to 20 vessels (Rasmussen, 1981).

The reason for the conflicts was the continued ambiguity over jurisdiction over the tuna resources. The U.S. maintained a policy that the fishery could only be governed effectively by international organizations such as the IATTC. Rather than start a real war with armed retaliation the U.S. decided to enforce its position through the Fisherman's Protective Act in 1954. This act stated that if a U.S. vessel was seized by a foreign country, on the basis of a claim that the U.S. did not recognize, then the Secretary of the Treasury would reimburse the owner (O'Malley Wade, 1986). The Secretary would then present the bill to the State Department in order to get reimbursement which in turn would be presented to the state that conducted the "illegal" seizure.

The purpose of the FPA was not only to provide the Pacific tuna fleet with access to its traditional fishing grounds but also to indirectly deny a 200 mile jurisdictional zone to foreign nations. The act used the distant water tuna fleet as agents of U.S. foreign policy with financial reimbursement as an alternative to "gunboat diplomacy" (U.S. Govt., 1977).

However, U.S. policy did not solve the original problem of legitimacy of the 200 mile zones or the question of management authority over tuna and it certainly did nothing to improve Latin American and U.S. diplomatic relations. It was a short-term, expedient response

that served as a compromise between the different parties without solving any of the factors causing the problem.

A succession of laws were enacted ranging from scaling down of foreign aid to weapon embargoes in order to coerce the foreign nation to make payment to prevent further seizures (Wolff, 1980). The U.S. government's unusually strong support of its own policy was mainly prompted by the efforts of the U.S. tuna fishermen's lobby, the American Tuna Association (ATA) based in La Jolla, CA (Wolff, 1980).

Latin American attempts in the 1960's and 1970's to unilaterally enforce extensive fishery claims beyond their territorial sea included both prescriptive and full enforcement jurisdiction (Bilder, 1974). The conflict continued due to the reluctance of many states, including but not limited to the U.S., to claim extended coastal jurisdiction or recognize any foreign zones.

Attempts were made in the late 1950's and early 1960's to solve the problem of coastal state authority over the adjacent living resources. The U.S. maintained a policy of limited coastal state jurisdiction and narrow territorial seas whereas the Latin American States were claiming exclusive jurisdiction over wide 200 mile zones that included control over tuna. The U.S. maintained that tuna could only be managed effectively through IOs such as the IATTC and did not recognize coastal state jurisdiction to manage tuna under any kind of unilateral claim.

The first United Nations Law of the Sea Conference in 1958 attempted to codify the emerging customs of coastal fisheries jurisdiction by defining a territorial sea in the Convention on the Territorial Sea and the Contiguous Zone. However there was no agreement

on the geographical extent of the claim and, neither this conference nor UNCLOS II in 1960, agreed on the width of the territorial sea. As a result of the failures of UNCLOS I and II to establish an international convention defining jurisdiction over the coastal fisheries, regional agreements began to appear (Kindt, 1984).

The open conflict in the tuna war subsided during the periods of international negotiations. Nations were unwilling to enforce unilateral claims that were being openly discussed in a legal forum. In addition the U.S. had strengthened its position regarding international management of tuna by its long-standing commitment to the IATTC. The conflicts broke out again in July 1980 when Mexico announced it would also enforce its 200 mile zone and included tuna under its jurisdiction. Soon after this time American boats were seized and catches and equipment were confiscated.

As described earlier the seizure of vessels is only an extreme form of enforcement. It took place because the IATTC was unable to enforce its regulations and left each member nation to police its own flag-vessels to ensure compliance with the quota restrictions (Healey, 1981). This has led to grave problems of unequal enforcement due, in part, to the inability of some coastal states to adequately conduct routine surveillance of their own vessels (Joseph and Greenough, 1979). These problems of logistics can in many cases be overcome if states were to agree to a form of inspection at the processing point or when the catch is unloaded (Healey, 1981). Reviews of cost-effective enforcement strategies in the U.S. have found that at-dock enforcement is efficient and achieves high compliance (Hennessey and Sutinen, 1987). An analysis

of the costs of the Costa Rican tuna fishery show that it would be far more economical to join in a regional organization where the costs of enforcement are distributed amongst all the members (Lepiz and Sutinen, 1985). The ineffectiveness of the IATTC to create a more harmonious, mutual type of enforcement is an additional characteristic of states unwillingness to acquiesce any authority to a foreign organization.

Recent U.S. policy

Until the mid-1970's the U.S. enforced its tuna policy based on its refusal to recognize extended jurisdictional zones as well as the interjurisdictional nature of tuna. The United States congress was under increasing pressure in the mid-1970's to also establish a 200-mile fishery zone. When the first bill arrived in congress, to establish a 200-mile zone for fisheries management, many national interests were expressed, including those of the West Coast tuna fishermen. The bill was made law as the Fisheries Management and Conservation Act (FMCA) on March, 1 1976 and specifically mentions that tuna are excluded from U.S. jurisdiction (U.S. Govt., 1976).

The political motivation for excluding tuna from U.S. control is readily apparent. United States exclusion of tuna means the U.S. can still justify its refusal to recognize the jurisdictional claims to tuna by foreign nations. U.S. tuna policy is necessary in order to sustain its legal position and to protect the commercial interests of the U.S. tuna fleet.

Included in the FMCA were similar embargo provisions to the Fisherman's Protective Act. In order to enforce U.S. policy, Section

205 of the FCMA requires the Secretary of the Treasury to impose an embargo on tuna products from a country that has seized an American vessel. Thus when Mexico began to enforce its new 200 mile zone and seized a U.S. tuna vessel after its 1980 amendment, the tuna war resurfaced in force. The embargo was apparently ineffective as in August 1986 the U.S. lifted it as a measure of good will towards Mexico, but in February 1987 another U.S. tuna vessel was seized by Mexico (Marine Fisheries Management, 1987). Disagreements within the IATTC regarding fees and allocation issues finally came to a climax when Mexico withdrew from the IATTC in 1978 and in 1980 extended its fishery jurisdiction in its 200 mile zone to include tuna (O'Malley Wade, 1986).

United States tuna policy is in direct conflict with all of the Resource Adjacent Nations (RAN) in the Pacific Ocean. Although the U.S. has attempted to provide for international cooperation over tuna in the east Pacific the emerging rights of coastal states to claim 200 mile zones seriously weakened the U.S. position.

Amongst the U.S. tuna fishermen themselves there are a range of positions regarding U.S. tuna policy and enforcement. A number of U.S. officials and members of the ATA have indicated a lack of conviction in the U.S. approach for international management of tuna and are willing to be flexible on this issue in relations with states who have claimed rights over tuna (U.S. Govt., 1981). In 1982 Senator Weicker unsuccessfully proposed the "American Tuna Act" (S. 1564) which would have amended the FMCA to include tuna in U.S. jurisdiction and reversed U.S. policy (U.S. Govt., 1981). The Senator's efforts were based on the

failure of the International Commission for the Conservation of Atlantic Tuna (ICCAT) to regulate western Atlantic Bluefin tuna (Hoover, 1981). The same factors that plagued the ICCAT's western partner -the IATTC- were responsible for causing serious overfishing of the Atlantic Bluefin tuna stocks. The U.S. Atlantic tuna fishermen believed that with unilateral authority over stocks within 200 miles the fishermen would gain more benefits and the stocks would be better managed.

The Western Pacific Fishery Management Council (WPFMC) has publicly opposed the tuna exclusion from the FMCA (U.S. Govt., 1981). The Western commonwealths not only have large tuna resources within their EEZs but the exclusion of management authority also interferes with the effective management of other highly migratory fish namely the Pacific Billfish. The State Department gave a deposition at the hearings for the American Tuna Act that mentioned it has "indicated and increased flexibility in approaching... fishery management plans [and] would not oppose the billfish management plan which the Department had opposed historically for several years" (U.S. Govt., 1981).

The U.S. tuna fleet was able to carry out its activities in the EEZ of the south Pacific States with virtual impunity due to the lack of effective offshore law-enforcement capabilities (Schachte, 1987). However it only took one patrol boat from the Solomon Islands in 1984 to bring the U.S. activities to the forefront of national attention with the seizure of an American trawler (Schachte, 1987).

In addition the Soviets had begun to exploit the situation and the anti-American sentiment in the islands by offering economic aid in return for Soviet presence and bases (Schachte, 1987). As a result the

U.S. underwent a major change in policy direction and recently concluded a large economic package of license fees and technological aid to the member nations of the South Pacific Forum States (U.S. Govt., 1987). The aid took the form of a fisheries treaty with the specific purpose of eliminating the problems caused by the different jurisdictional positions of the U.S. and the Pacific Island States. It established a mechanism whereby regional fishing licenses will be provided to the U.S. tuna industry. It has been argued that these agreements represent de facto acceptance of coastal state jurisdiction over tuna resources (Healey, 1981) and that the U.S. position is now in danger of stating and practicing contradictory policies.

The U.S. government's official position has however remained the same since the Truman Proclamation. It is mainly because of its steadfast belief that tuna can only be managed through an international organization, or not at all, that the South Pacific Forum decided to exclude the U.S. from its membership (Copes, 1987). U.S. policy has seriously threatened the ability of the U.S. to directly interact with the Pacific States and has once again relied on the ATA to determine its foreign policy position. The U.S. has nothing to gain by divorcing its public policy position from its private acceptance of coastal state jurisdiction.

Status of the IATTC

After the demise of the IATTC with the withdrawal of Mexico in 1978, the Latin American States and the U.S. are still attempting to formulate another international fisheries agreement. The problems of

how to enforce the recommendations of this future organization are being considered differently than before. An enforcement proposal between Mexico, Costa Rica and the U.S. in 1979 agreed to many provisions including a uniform system of fines and sanctions for violations of conservation regulations (Joseph, 1983b). In addition it established a mutual enforcement policy that would permit reciprocal port inspections and would impose a system of sanctions against non-member governments that disregarded the conservation measures (Joseph, 1983b).

At subsequent meetings the nations agreed on the need for an International Organization to conserve and manage the resources, that voting would be based on unanimity, that all principle market species of tuna should be included and that access would be granted into coastal state EEZ with the use of a license structure (Joseph, 1983b). The Nations were able to agree on yellowfin allocations for the RANs, a license structure and special provisions for disadvantaged vessels (Joseph, 1983b). The 1983 Eastern Pacific Ocean Tuna Fishing Agreement was not signed due to remaining controversy over a provision that allowed a last open trip of 30 days for vessels in port at the end of the fishing season (Joseph, 1983b).

There are presently no international regulations over the eastern Pacific tuna fishery. The IATTC is simply attempting to continue its research program with the bulk of the remaining U.S. funding. The past failures of IO's to effectively regulate international fisheries has led many authors to conclude that the U.S. fishing policy should be amended to include tunas in U.S. jurisdiction rather than extend or redefine

the authority of international fishery organizations (Pedigo, 1982; O'Malley Wade, 1986; Hoover, 1983; Devnew, 1981).

The most significant impact of U.S. tuna policy is its inconsistency with the 1982 LOS Convention and the provisions regarding management of highly migratory species. Although the U.S. has not signed the treaty, the fishery provisions in part V appear to be emerging as de facto international law (Copes, 1981) and the juridical position of the U.S. has been severely weakened.

CHAPTER SIX

EFFECTS OF UNCLOS III ON TUNA MANAGEMENT

Effects on Geographical Extent of Jurisdiction

In the east Pacific the goals of the nations are very different but can be divided into two major groups. The developing Resource Adjacent Nations (RANs) believe they have sole management authority over the resource whereas the developed tuna fishing nations defend the common property, open access philosophy for their distant water fleets (Joseph, 1977). The unilateral claims by Chile, Ecuador and Peru (CEP) to 200 miles in the late 1950's was vigorously opposed by the U.S. but continuously enforced by the CEP countries. Eventually UNCLOS III in 1982 provided for a 200 mile EEZ as part of international law.

The appeal of global and regional efficiency with effective international cooperation was unattainable due to the unwillingness of states to surrender historical powers to a supranational authority (Copes, 1981). This left the IO's with no enforcement powers and the realization that effective management of the world's fishery resources would be best achieved by extended national jurisdiction.

The 200 mile EEZ has been termed a "second best" solution to the problems of fishery management (Copes, 1981). Rights, responsibilities and culpability are now more clearly defined than they were with International Organizations but at the cost of dividing up resources into artificial zones that have no biological meaning or management cohesiveness.

The 200 mile zone has now become a part of international law. The failure of IO's is often cited as a cause for states to resort to coastal control of their resources. The IATTC was part of the "Golden Age" of international fishery organizations that spanned the interim period from 1945 to the mid-1970's. International organizations were seen as the only rational means of managing coastal stocks of fish that were beyond national jurisdiction. They were also seen as the only effective method of managing stocks that migrated between zones of coastal authority and had the advantage of covering the stock as a unit throughout its range. This type of management structure is especially relevant for the wide open ocean migrations of the tuna species.

Effects on Data Collection and Information Transfer

Now that coastal states have control over their 200 mile zone there will be an increasing trend to try and carry out their own research rather than rely on international organizations. Coastal states may even depreciate the advice given by the international commissions (Cardosa, 1978) especially if it is perceived that the IO is under the political influence of a foreign state. This will be especially damaging for states without the technological ability or expertise to carry out extensive scientific expeditions (Copes, 1981).

Eventually it is hoped that underdeveloped countries will be able to develop their own research capabilities with a priority on creating an effective structure for the role of fisheries research (Simpson, 1978). Until these lesser-developed coastal nations are able to build up their own research facilities it will be to their advantage to

collaborate with the scientific endeavors of distant water fleets and international organizations (Garcia et al., 1986).

Although the coastal nation is bound to determine the allowable catch in its EEZ it should also assist in the research in order to avoid unsupervised and possible manipulation of the fishery statistics. In addition many oceanographic problems cannot be investigated adequately in one zone and the role of IO's may be crucial in creating access for scientific parties across political boundaries.

Articles 119 and 61 of UNCLOS III both call for information exchange outside of the structure of international organizations. These articles could simply be interpreted as a reinforcement of the vital need for data transfer or imply a recognition that the demise of IO's may inhibit future communication between states unless informal means are encouraged. Either way the paramount need for international cooperation for data transfer is plainly evident as management efforts go forward.

Effects on Interjurisdictional Fisheries

The dichotomy between the RANs and the harvesting nations has been described above. The tuna fleets from the distant water harvesting nations were vigorously opposed to extended jurisdiction of coastal states. The United States implemented its own national legislation in 1976 claiming 200 mile zones but excluded tuna on the grounds that they can only be managed effectively by an international organization due to their highly migratory nature.

Articles 56 and 64 of UNCLOS III are just two of the provisions of the new fisheries regime for describing the management of Highly Migratory Species (HMS). The articles cover HMS management, both in and out of coastal EEZs, but there is a distinct lack of specificity as to how these regulations are to be enforced (Copes, 1981). Inside the EEZ, Article 56 gives sovereign rights to the coastal state to "manag[e] the natural resources, whether living or non-living, of the water superjacent to the sea-bed...". Article 64 requires coastal and fishing states to cooperate regarding conservation and utilization of tuna in both the EEZ and the High Seas.

Beyond the EEZ, in the High Seas, it is necessary to consider Articles 87 and 116-119 which give organizations such as the IATTC the authority to make management regulations. In addition the management provisions for HMS in Article 64 are more in the nature of philosophical guidelines rather than enforceable regulation (Copes, 1981). The 1982 LOS Convention has on one hand granted states jurisdiction over their EEZ but on the other the vague language of the details of enforcement means that some type of compulsory international dispute settlement must be implemented as soon as possible (Bilder, 1974).

The U.S. has decided to interpret Article 64 so that it precludes a coastal state from establishing sovereign rights over tuna. Burke (1984) clearly shows that the U.S. is misinterpreting the Article. He states that Article 64 is simply an extension of Article 56 and that Article 64 specifically states it is in addition to the rest of the section in Part V. The treaty does not provide an exemption of tuna from coastal state authority but rather encourages, versus requires, the

state to work with international organizations for effective management of tuna both within and outside its EEZ.

The United States stands almost alone amongst the worlds tuna fishing nations by interpreting Article 64 of UNCLOS III as a call "for cooperation regarding Highly Migratory Species (HMS) both within the EEZ and beyond on the High Seas." As Burke (1982, 1984) describes, ones interpretation seems to depend entirely on the emphasis with which one regards the preceding relevant articles. Articles 56, 61 and 62 give coastal states management authority over all of the living resources within their EEZ. If these articles are regarded as subordinate to article 64 then one could state a case for lack of state jurisdiction over tuna within its own EEZ.

All coastal nations, except the U.S., explicitly or implicitly claim management authority over tuna within their EEZ. This global inclusion of tuna in coastal nation fisheries begins the de facto emergence of customary international law of coastal state jurisdiction over HMS even if the statutory articles are ambiguous.

The U.S. is alone in not recognizing coastal sovereign rights over tuna in its EEZ (O'Malley Wade, 1986). It believes that international organizations are the only legal management bodies for the tuna fisheries. As we have seen the question of jurisdiction is important in preventing the "tragedy of the commons" especially when the tragedy takes on new meaning with armed conflict over the resource. Even if the question of jurisdiction remains unsolved the role and effectiveness of international organizations will play a key part in the future management of tuna.

CHAPTER SEVEN

THE FUTURE OF TUNA MANAGEMENT

Regional and Global Organizations

It has recently been argued that international management of tuna is a "concept whose time has come and gone" (Hoover, 1983). The "Golden Age of international organizations was seen as existing during a period of limited national jurisdiction over the adjacent ocean (Gulland, 1984b). However the argument for regional management is still expressed due to the wide range of the yellowfin and skipjack migrations. It has even been considered whether the geographical area covered by the IATTC convention is large enough for effective management (Koers, 1973).

A compromise must be reached at some point between attempting to manage the stock as a unit throughout its range and yet also have the effective bureaucratic authority and surveillance techniques to cover the area in question. The suggestions for global organizations (Joseph, 1977) must take into account an extensive and possibly cumbersome bureaucracy that may end up as part of the United Nations and the FAO. It seems that the previously described problems of incorporating science into policy and enforcing effective management measures will only be magnified with a global organization.

The need for complex interjurisdictional fishery organizations is only necessary when the species migrate across multiple boundaries. A high priority for the IATTC tuna research has been tagging studies that illustrate the extent of tuna migrations (Peterson and Bayliff, 1985).

Unfortunately it was these very studies that were cut when funding was considered inadequate in the mid-1960's (Rose, 1974). It is believed that separate stocks of Yellowfin exist in the east and west Pacific and increased tagging and migration information is a top priority for future research (Hunter et al., 1986). The result is that tuna management is still based on the assumption of highly migratory stocks that mix between national boundaries.

This assumption has recently been tested and the available data reanalyzed by Hilborn and Sibert (1988). Their conclusion is that long-scale tuna migration for the Yellowfin and Skipjack species is the exception rather than the rule and that states with large EEZ's are perfectly capable of individual management of the adjacent resource. In addition the high mortality rates of Yellowfin (6 % per month) and Skipjack (17% per month) mean that countries with large EEZ's will be little affected by adjacent nation's fishing policies (Hilborn and Sibert, 1988).

Bilateral Agreements and Decentralized Policy Making

The United States has recently begun to negotiate terms for the purchase of licenses from countries in the West Pacific as well as the East Pacific. In 1983 a vessel licensing plan was agreed to but not ratified between the U.S. and Costa Rica and Panama. It has been argued that this trend exemplifies *de facto* recognition by the United States and the American Tunaboat Association of coastal state rights to claim ownership over tuna resources within their EEZ (Larson, 1983).

A multitude of bilateral fishery agreements already exist between coastal nations with large fishery resources and distant-water nations who wish to harvest them (Carroz and Savini, 1979). Methods to these ends are already being discussed for the tuna industry between Indonesia and Japan (Marten et al., 1982); between the U.S., Japan, South Korea and the USSR with the South Pacific Forum (Teiwaki, 1987); between the U.S. and Costa Rica and Panama (U.S. Govt., 1987); and the U.S. and Mexico (Miller and Broches, 1985). Indonesia (Comitini and Hardjolukito, 1986) the Maldives (Sathiendrakumar and Tisdell, 1986) and the Philippines (Aprieto, 1980) are all considering methods to extract economic rent from distant water fleets while also building up their own harvesting capacity. They all recognize the need to participate in international cooperation but do not feel the need to join an international organization.

It seems that with the breakdown of formal international agreements a new international fishery policy is emerging that is based on industry initiation of bilateral or multilateral agreements. Resource Adjacent Nations (RAN) in the East Pacific are demanding a price for the resources within their EEZs. The tuna harvesting industry will have to negotiate fair prices from each country or group of nations in order to obtain those resources that are no longer considered a common property. This will involve intergovernment cooperation but solely on the need to establish a fair price. On the High Seas the fishery will be left alone as a traditional common property.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

Management of the eastern Pacific tuna fishery by an international organization has proven to be ineffective. An international organization, such as the IATTC, does not have the necessary supranational authority to implement its own management measures over an international fishery. In addition, the IATTC has no power to enforce its recommendations due to the unwillingness of nation states to submit any authority to an external organization. It has also been shown that a large, centralized agency is too far removed from the fishermen who the organization is attempting to regulate. The result is the fishermen and the industry are unable to directly participate in the policy process. Industry participation is necessary to avoid charges of unfair restrictions and to gain fishermen's compliance with the regulations.

The reasons for the creation of the IATTC in the first place were based on jurisdictional disputes over tuna rather than scientific issues. Yet the IATTC was designed as a scientific organization to collect data on the tuna fishery for the purposes of conservation and management and not to directly resolve any jurisdictional dispute. This difference in implicit and explicit purposes ment the Commission was unable to fulfill its stated objective of maintaining a maximum sustainable yield. Member nations had different objectives and goals for "rational" management of the resource. The diversity of national interests and members of the IATTC only caused for further disagreement

on any management recommendation. It comes as no surprise therefore when it is found that scientific information played a very minor role in the policy process (Rose, 1974).

The problem arises when one implicitly creates an international scientific Commission to resolve an international jurisdictional and political problem. The scientists are not trained to resolve the political issues and the biological data is largely irrelevant in the policy process (Rose, 1974). In addition the dominance of individual nationalistic interests ment that the tuna stocks were exploited beyond the recommended levels by the scientists (IATTC, 1987).

The IATTC has no authority to compel member states to follow its recommendations. Each member state is under agreement in the Convention to enact legislation necessary to carry out the purposes of the convention (Article III). It could be argued that each nation has done this by assisting in the research and attending the meetings. There is no stipulation in the convention that the member nations must follow the recommendations. If the stocks of Yellowfin were to be fished to economic extinction then the IATTC can not be blamed for failure to carry out its functions or the member states from violating the convention. Individual national policy is responsible for the IATTC achievements and its successes and failures are the results of the individual nation's goals and policy.

Joseph and Greenough (1979) describe in detail alternative measures for tuna management that are still based on an international organization using economic and biological theory. However, external political forces tend to obscure both type of scientific analyses

(Anderson, 1980). It would seem that quantitative methods of management and analysis are fragile and unrealistic in the realm of an International Organization if one also expects the organization to implicitly resolve jurisdictional or political disputes, as was the case with the IATTC.

Another problem with IOs, that stems from the lack of supranational authority, is that the individual member nations need to have similar goals of "rational" management in order to make the organization work. However, each nation has different objectives for its tuna fishery and a call for harmony over political goals in the IO is unrealistic and irrelevant. In the IATTC the need for unanimous voting means the organization has to produce management recommendations that satisfy all members. This usually means that the Commission has to arrive at the lowest common denominator of each nation's demands and frequently the least effective form of management recommendation.

Lack of authority over the geographic area in question and the voluntary nature of membership means that an IO will always be vulnerable to the "free rider". Yet both international organizations and individual nations are unable to claim undisputed jurisdiction over areas of the ocean previously considered as High Seas. The Truman Proclamation and Declaration of Santiago illustrate the futility of attempting sole expansion of authority over a geographic area. Individual national actions outside of the international community, often result in some type of international conflict as seen with the "Tuna Wars".

The third United Nations Law of the Sea Conference has finally established international guidelines for the east Pacific tuna fishery that may resolve the "free rider" problem and the question of jurisdiction over tuna resources within 200 miles of the coast. The basic question of geographical extent of control has been resolved with the formation of the 200 mile Exclusive Economic Zones. It has been termed a second-best solution but is more practical than international organizations and has worldwide acceptance. It is a second best approach because the division of the ocean with political boundaries serves to artificially divide many stocks of fish. Special problems of jurisdiction over transboundary stocks are now created with the formation of EEZs.

UNCLOS III has also attempted to solve the problem of jurisdiction over these transboundary stocks and highly migratory species. International law is vague but interpreted as giving coastal states jurisdiction over tuna within 200 miles. United States policy still refuses to accept this position and has served to isolate it from many rich tuna grounds within foreign nation's EEZs. It has also led to recent conflict with RANs in the West Pacific. The United States policy to not recognize tuna as belonging to coastal state jurisdiction must be changed. The United States FMCA needs to be amended to include tuna in its jurisdictional authority.

At the same time UNCLOS III also stresses that data on transboundary stocks should be transferred and exchanged through IOs or directly between nations. It is possible that the creation of EEZs will

further isolate individual nations to the detriment of information flow and the scientific understanding of shared stocks of fish.

So far it has been shown that IO's have been ineffective as managers or enforcers of the eastern tropical Pacific tuna fishery. It is argued below that coastal state governments and industry are a more effective for tuna management and enforcement with a decentralized policy structure. The choice of an effective tuna management organization must also take into account the source and control of funding to the organization.

Normally international organizations are subject to the financial constraints of the member nations. The IATTC is unusual in that it is largely funded by the U.S. and does not impose any major financial burden on any additional participants. It has been suggested that the creation of the IATTC was a form of U.S. subsidy to Latin American coastal nations (Rose, 1974). In return for U.S. funding of the IATTC the U.S. distant water fleet was granted access to the foreign coastal waters. Conflicts of jurisdictional philosophy over tuna and claims over coastal waters were therefore by-passed via the IATTC.

Although international scientific organizations are usually subject to the financial pressures of many nations, national scientific organizations are also subject to many financial constraints due to the different internal forces that shape an individual nation's policy. Therefore there seems to be little difference in choice between national versus international organizations for tuna management based on how robust the organization will be from financial manipulation and control.

An international organization is still extremely important as a collector and analyzer of data on the tuna fishery. The pooling of data on the tuna fishery is especially necessary by an international organization due to the highly migratory nature of the species and the controversial nature of the industry. The wide ranging nature of the tuna means that individual nations will only be able to collect partial information on both species and fishing effort while the stocks remain in national waters. In order to gain a holistic view of the fishery and the biology some type of international cooperation is essential. The task was formidable but the IATTC has prooven it is capable of conducting the necessary research and producing important results. The IATTC had a reputation for confidentiality and nation states are more likely to release data to a third, neutral party rather than a competing, foreign nation.

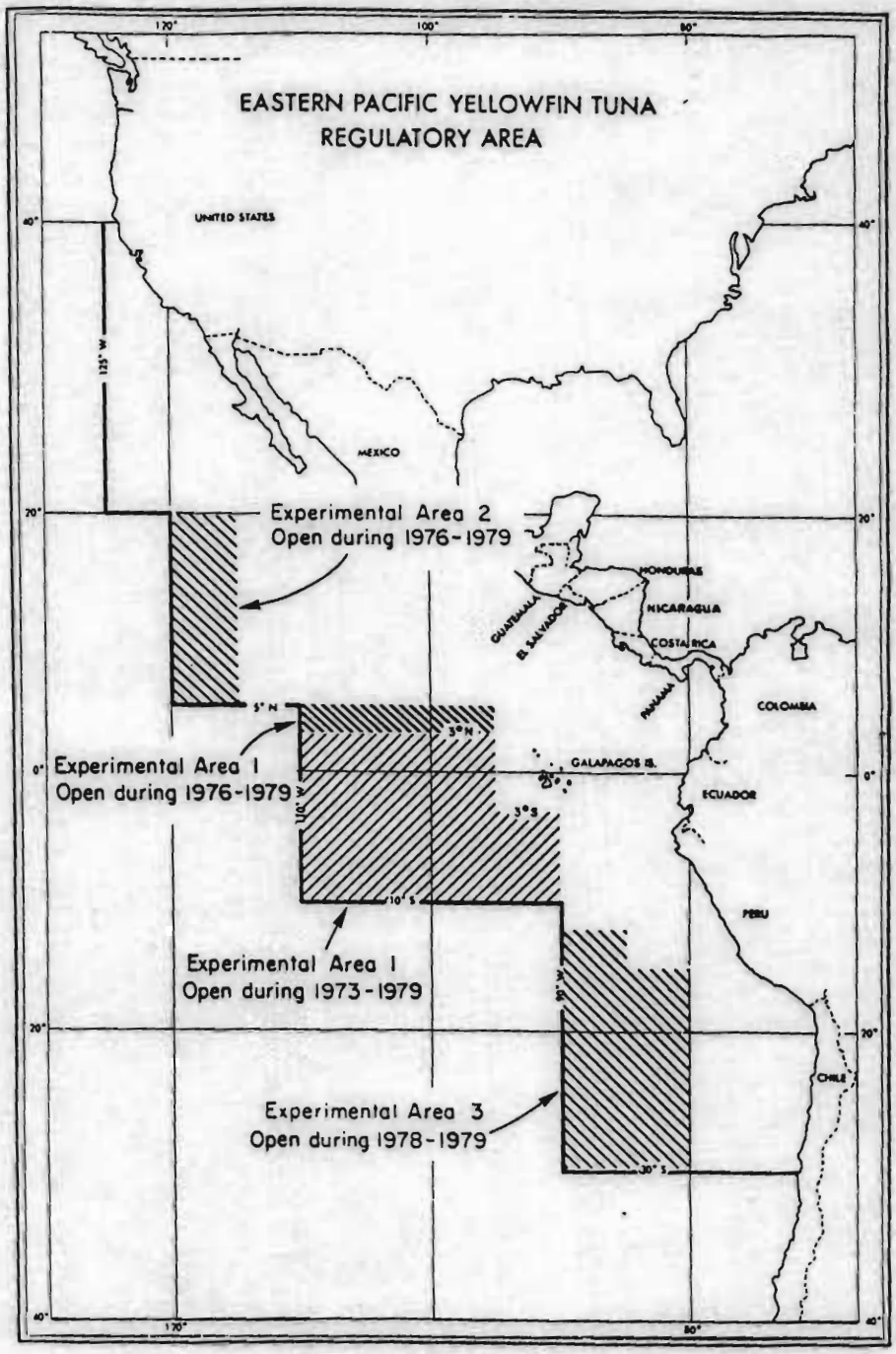
An effective tuna management organization in the east Pacific needs to completely separate the scientific aspects of the fishery from the remaining issues that exist between the harvesting and the RANs. The data that is collected must not only be effectively transferred to the decision makers but it is vital that it is uncorrupted during the collection or analysis process. The subjective interpretation of the data can be done by the individual governments and industries of each harvesting or resource adjacent nation. Part of the reason for the failure of the IATTC was the lack of ability of a centralized bureaucracy to adapt its mandate to meet the changing needs of the industry. An organization that is solely designed to collect data will not have to concern itself as to whether the data is to be used to

create policy or simply execute a chosen management strategy. The position of entry of the scientific information will be left up to the decision-makers.

The role of an IO such as the IATTC could be solely that of a data collector totally removed from the socio-economic and political forum. The data transfer could even be done at a simpler level through the cooperation of member state universities in the form of international grants. Industry may be asked to bear some of this cost as the data are ultimately of their sole benefit. The IATTC was very successful in undertaking scientific investigations and collecting fisheries data that the Convention required. The problems arose when it went a step further and attempted to recommend conservation measures.

There is still a need for effective transfer and collection of scientific information regarding fishery stocks that cross jurisdictional boundaries (Gulland, 1984b). The IATTC has managed to serve this function well and should continue to be supported towards this end. A simple structure facilitating information transfer may ultimately coordinate the research of both the west and eastern Pacific nations that have an interest in the tuna industry (Castila and Vicuna, 1984). An opportunity exists to work within the present boundaries of international law and UNCLOS III and use the experience of organizations such as the IATTC to prevent unnecessary international conflict. Simple unilateral or multilateral economic agreements between individual states, with industry participation, will establish the necessary management and conservation measures that have previously been attempted by an international organization.

APPENDIX 1 Eastern Pacific Yellowfin Tuna Regulatory Area



Source: IATTC Annual Report, 1987. La Jolla, CA.

APPENDIX 2 Convention Between the United States and the Republic of Costa Rica for the Establishment of an Inter-Amercian Tropical Tuna Commission

CONVENTION BETWEEN THE UNITED STATES OF AMERICA AND THE REPUBLIC OF COSTA RICA FOR THE ESTABLISHMENT OF AN INTER-AMERICAN TROPICAL TUNA COMMISSION

The United States of America and the Republic of Costa Rica considering their mutual interest in maintaining the populations of yellowfin and skipjack tuna and of other kinds of fish taken by tuna fishing vessels in the eastern Pacific Ocean which by reason of continued use have come to be of common concern, and desiring to cooperate in the gathering and interpretation of factual information to facilitate maintaining the populations of these fishes at a level which will permit maximum sustained catches year after year, have agreed to conclude a Convention for these purposes and to that end have named as their Plenipotentiaries:

The President of the United States of America:
James E. Webb, Acting Secretary of State
Wilbert M. Chapman, Special Assistant to the Under Secretary of State

The President of the Government of Costa Rica:
Mario A. Esquivel, Ambassador Extraordinary and Plenipotentiary of Costa Rica
Jorge Hazera, Counselor of the Embassy of Costa Rica

who, having communicated to each other their full powers, found to be in good and due form, have agreed as follows:

ARTICLE I

1. The High Contracting Parties agree to establish and operate a joint Commission, to be known as the Inter-Amercian Tropical Tuna Commission, hereinafter referred to as the Commission, which shall carry out the objectives of this Convention. The Commission shall be composed of national sections, each consisting of from one to four members, appointed by the Governments of the respective High Contracting Parties.

2. The Commission shall submit annually to the Government of each High Contracting Party a report on its investigations and findings, with appropriate recommendations, and shall also inform such Governments, whenever it is deemed advisable, on any matter relating to the objectives of this Convention.

3. Each High Contracting Party shall determine and pay the expenses incurred by its section. Joint expenses incurred by the Commission shall be paid by the High Contracting Parties through contributions in the form

and proportion recommended by the Commission and approved by the High Contracting Parties. The proportion of joint expenses to be paid by each High Contracting Party shall be related to the proportion of the total catch from the fisheries covered by this Convention utilized by that High Contracting Party.

4. Both the general and annual program of activities and the budget of joint expenses shall be recommended by the Commission and submitted for approval to the High Contracting Parties.

5. The Commission shall decide on the most convenient place or places for its headquarters.

6. The Commission shall meet at least once each year, and at such other times as may be requested by a national section. The date and place of the first meeting shall be determined by agreement between the High Contracting Parties.

7. At its first meeting the Commission shall select a chairman and a secretary from different national sections. The chairman and the secretary shall hold office for a period of one year. During succeeding years, selection of the chairman and the secretary from the national sections shall be in such a manner that the chairman and the secretary will be of different nationalities, and as will provide each High Contracting Party, in turn, with an opportunity to be represented in those offices.

8. Each national section shall have one vote. Decisions, resolutions, recommendations, and publications of the Commission shall be made only by a unanimous vote.

9. The Commission shall be entitled to adopt and to amend subsequently, as occasion may require, by-laws or rules for the conduct of its meetings.

10. The Commission shall be entitled to employ necessary personnel for the performance of its functions and duties.

11. Each High Contracting Party shall be entitled to establish an Advisory Committee for its section, to be composed of persons who shall be well informed concerning tuna fishery problems of common concern. Each such Advisory Committee shall be invited to attend the non-executive sessions of the Commission.

12. The Commission may hold public hearings. Each national section also may hold public hearings within its own country.

13. The Commission shall designate a Director of Investigations who shall be technically competent and who shall be responsible to the Commission and may be freely removed by it. Subject to the instruction of the Commission and with its approval, the Director of Investigations shall have charge of:

(a) the drafting of programs of investigations, and the preparation of budget estimates for the Commission;

(b) authorizing the disbursement of the funds for the joint expenses of the Commission;
(c) the accounting of the funds for the joint expenses of the Commission;
(d) the appointment and immediate direction of technical and other personnel required for the functions of the Commission;
(e) arrangements for the cooperation with other organizations or individuals in accordance with paragraph 16 of this Article;
(f) the coordination of the work of the Commission with that of organizations and individuals whose cooperation has been arranged for;
(g) the drafting of administrative, scientific and other reports for the Commission;
(h) the performance of such other duties as the Commission may require.

14. The official languages of the Commission shall be English and Spanish, and members of the Commission may use either language during meetings. When requested, translation shall be made to the other language. The minutes, official documents, and publications of the Commission shall be in both languages, but official correspondence of the Commission may be written, at the discretion of the secretary, in either language.

15. Each national section shall be entitled to obtain certified copies of any documents pertaining to the Commission except that the Commission will adopt and may amend subsequently rules to ensure the confidential character of records of statistics of individual catches and individual company operations.

16. In the performance of its duties and functions the Commission may request the technical and scientific services of, and information from, official agencies of the High Contracting Parties, and any international, public, or private institution or organization, or any private individual.

ARTICLE II

The Commission shall perform the following functions and duties:

1. Make investigations concerning the abundance, biology, biometry, and ecology of yellowfin (*Neothunnus*) and skipjack (*Katsuwonus*) tuna in the waters of the eastern Pacific Ocean fished by the nationals of the High Contracting Parties, and the kinds of fishes commonly used as bait in the tuna fisheries, especially the anchoveta, and of other kinds of fish taken by tuna fishing vessels; and the effects of natural factors and human activities on the abundance of the populations of fishes supporting all of these fisheries.

2. Collect and analyze information relating to current and past conditions and trends of the populations of fishes covered by this Convention.

3. Study and appraise information concerning methods and procedures

for maintaining and increasing the populations of fishes covered by this Convention.

4. Conduct such fishing and other activities, on the high seas and in waters which are under the jurisdiction of the High Contracting Parties, as may be necessary to attain the ends referred to in subparagraphs 1, 2, and 3 of this Article.

5. Recommend from time to time, on the basis of scientific investigations, proposals for joint action by the High Contracting Parties designed to keep the populations of fishes covered by this Convention at those levels of abundance which will permit the maximum sustained catch.

6. Collect statistics and all kinds of reports concerning catches and the operations of fishing boats, and other information concerning the fishing for fishes covered by this Convention, from vessels or persons engaged in these fisheries.

7. Publish or otherwise disseminate reports relative to the results of its findings and such other reports as fall within the scope of this Convention, as well as scientific, statistical, and other data relating to the fisheries maintained by the nationals of the High Contracting Parties for the fishes covered by this Convention.

ARTICLE III

The High Contracting Parties agree to enact such legislation as may be necessary to carry out the purposes of this Convention.

ARTICLE IV

Nothing in this Convention shall be construed to modify any existing treaty or convention with regard to the fisheries of the eastern Pacific Ocean previously concluded by a High Contracting Party, nor to preclude a High Contracting Party from entering into treaties or conventions with other States regarding these fisheries, the terms of which are not incompatible with the present Convention.

ARTICLE V

1. The present Convention shall be ratified and the instruments of ratification shall be exchanged at Washington as soon as possible.

2. The present Convention shall enter into force on the date of exchange of ratifications.

3. Any government, whose nationals participate in the fisheries covered by this Convention, desiring to adhere to the present Convention, shall address a communication to that effect to each of the High Contracting Parties. Upon receiving the unanimous consent of the High Contracting Parties to adherence, such government shall deposit with the Government

of the United States of America an instrument of adherence which shall stipulate the effective date thereof. The Government of the United States of America shall furnish a certified copy of the Convention to each government desiring to adhere thereto. Each adhering government shall have all the rights and obligations under the Convention as if it had been an original signatory thereof.

4. At any time after the expiration of ten years from the date of entry into force of this Convention any High Contracting Party may give notice of its intention of denouncing the Convention. Such notification shall become effective with respect to such notifying government one year after its receipt by the Government of the United States of America. After the expiration of the said one year period the Convention shall be effective only with respect to the remaining High Contracting Parties.

5. The Government of the United States of America shall inform the other High Contracting Parties of all instruments of adherence and of notifications of denunciation received.

IN WITNESS WHEREOF the respective Plenipotentiaries have signed the present Convention.

DONE at Washington, in duplicate, in the English and Spanish languages, both texts being equally authentic, this 31st day of May, 1949.

FOR THE UNITED STATES OF AMERICA:

James E. Webb
W. M. Chapman

FOR THE REPUBLIC OF COSTA RICA:

Mario A. Esquivel
Jorge Hazera

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