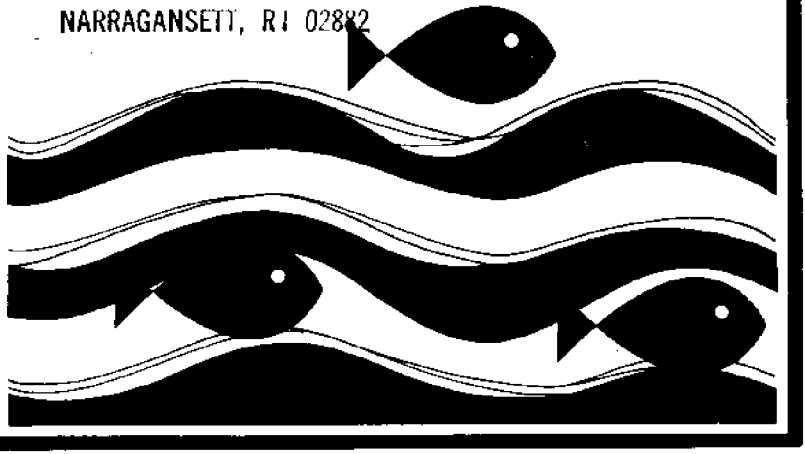
Extended Fishery Jurisdiction: Problems and Progress, 1977

Proceedings of the North Carolina Governor's Conference on Fishery Management under Extended Jurisdiction



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Raleigh, N. C. October 11-12, 1977

Karen M. Jurgensen, Adele Porter Covington, editors; Coastal Plains Center for Marine Development Services, National Oceanic and Atmospheric Administration, National Sea Grant Program, N. C. Marine Science Council, University of North Carolina Sea Grant College Program, sponsors

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PREFACE

The passage of P.L. 94-265, the Fishery Conservation and Management Act (FCMA) of 1976, is regarded by many as the single most important piece of fisheries legislation in United States (US) history. To assess the problems and progress of implementing this significant national legislation, the North Carolina Governor's Conference on Fishery Management Under Extended Jurisdiction was held in Raleigh, North Carolina, on October 11-12, 1977.

The FCMA for the first time develops (1) a mechanism for the management of US marine fishery resources; (2) a procedure whereby the states and the federal government can work together through eight regional councils to manage fishery stocks; (3) a systematic examination and protocol for managing fisheries through development of fishery management plans; (4) a set of criteria in the form of innovative National Standards by which fishery management plans can be judged; and (5) requirements for innovative data management systems and research in fishery management science, theoretical approaches to more thorough management, application of fishery economics to management decisions, and studies of the causes of variability in fish stocks. The Conference provided a forum for the participants in this broad new program to discuss the difficulties they have encountered--and foreseen--in the six months since the FCMA went into effect.

The twenty Conference papers--by state, regional, and national officials, as well as foreign representatives--are presented here along with some edited discussion. Unfortunately, some of the discussions were unavoidably lost.

This is the first of what will be annual conferences sponsored by the North Carolina Marine Science Council (NCMSC) on marine subjects of national and international importance. In addition to the NCMSC, sponsors for the Conference were the Coastal Plains Center for Marine Development Services, the National Oceanic and Atmospheric Administration, the National Sea Grant Program, and the University of North Carolina Sea Grant College Program.

--The Editors
December, 1977

C O N T E N T S

INTRODUCTION

Karen M. Jurgensen

With the Fishery Conservation and Management Act (FCMA) of 1976, the United States (US) began a new era of fishery conservation, management, and production. Nationwide planning for fisheries within 200 miles of US shores was to protect finite resources and provide for their rational use--giving US fishermen first priority, but also allowing foreign fishermen to take surpluses.

Less than a year since it took effect, on March 1, 1977, the FCMA has indeed brought major changes to foreign and domestic fishing. In 1977 foreign fishing within 200 miles of US shores was reduced to three-fourths of the 1976 level. The eight Regional Fishery Management Councils (RFMCs), which are charged with implementing the FCMA, were operating. Fourteen preliminary management plans were in effect for 1977 and were to be amended for 1978. The RFMCs submitted, and the Secretary of Commerce approved, two final management plans.

However, as with any major legislation, the problems and questions of implementation are many. Among the state, regional, and national officials at the North Carolina Governor's Conference on Fishery Management Under Extended Jurisdiction there was general agreement that the FCMA will work through the RFMCs. Beyond that agreement, however, there was considerable discussion of the sweeping ramifications of the new legislation as it affects (1) resource allocation, (2) data collection, (3) optimum yield, (4) the domestic fishing industry, (5) relations with other nations, and (6) the mechanics of implementation.

Resource allocation: The US has entered a new era of ocean use. Differing needs and philosophies are challenging long-established practices. The RFMCs must decide how to share finite resources equitably in the face of increasing demands. Those demands come from consumers and conservationists as well as from the foreign and domestic fishing industries.

Data collection: In managing US fisheries, the RFMCs must take into consideration economic and sociological factors as well as biological information. Therefore, effective management requires improved information on population and recruitment of fish stocks; a rapid-

response capability in biological information gathering; and data on predator-prey relationships. In addition, effective management also requires public input on such issues as marine recreational fisheries.

Optimum yield: In balancing biological and socio-economic factors to decide on the optimum yield of a particular fishery, the RFMCs face conflicting management philosophies. For example, how can the consumer's interest in a low price be reconciled with the fisherman's interest in a high price? A standardized definition of optimum yield is suggested by some to assist the RFMCs in making judgments concerning the relative needs of sports and commercial fishermen, processors, consumers, and conservationists.

Effect on domestic fishing industry: Management of fish stocks is occurring. Additional tonnage is available to the US industry. The National Marine Fisheries Service estimates that by 1978 catches in regulated fisheries--where there is both US and foreign activity--may be up 26 percent for US fishermen and down 20 percent for foreign fishermen. It is expected that as foreign fishing declines in the face of increasing US capability and needs, enforcement efforts will focus more on US fishing operations. Additionally, some people say the RFMCs also provide the vehicle for management of purely domestic fisheries. The effect of all this on the US fishing industry, on the US seafood market, and on recreational fishing remains to be seen.

Relations with other nations: There is a developing international order which recognizes 200-mile zones. Agreements must be negotiated both with those nations whose fishermen fish in the US Fishery Conservation Zone and with those nations in whose zones US vessels fish. Twelve such Governing International Fisheries Agreements have been signed. Joint ventures between US and foreign fishing interests also are being considered. Supporters say the joint ventures would allow the US to develop new fisheries while allowing other nations a bigger share of US stocks. More broadly, the background for all foreign relations could change if a United Nations Law of the Sea treaty is adopted. The FCMA would have to be modified to mesh with that document and, according to observers, there appear to be serious differences.

The mechanics of implementation: New institutional machinery for the conservation and management of fish resources has been created and is being refined. Among those issues to be resolved for this new form of regional management are: the complexities of drawing up uniform

management plans; coordination with other legislation; and coordination among disparate regional, state, and local jurisdictions.

Conference papers offered good news as well as bad on these issues. Papers in the opening session gave a broad overview of the considerable progress of FCMA implementation, the FCMA's relation to the United Nations Law of the Sea proceedings, and its effect on both foreign and US distant-water fishing.

Papers on planning for fishery management presented strategies for determining optimum yield, the consequences of uncontrolled fishery development, and the complexities--as well as the unexpected results--of drawing up management plans.

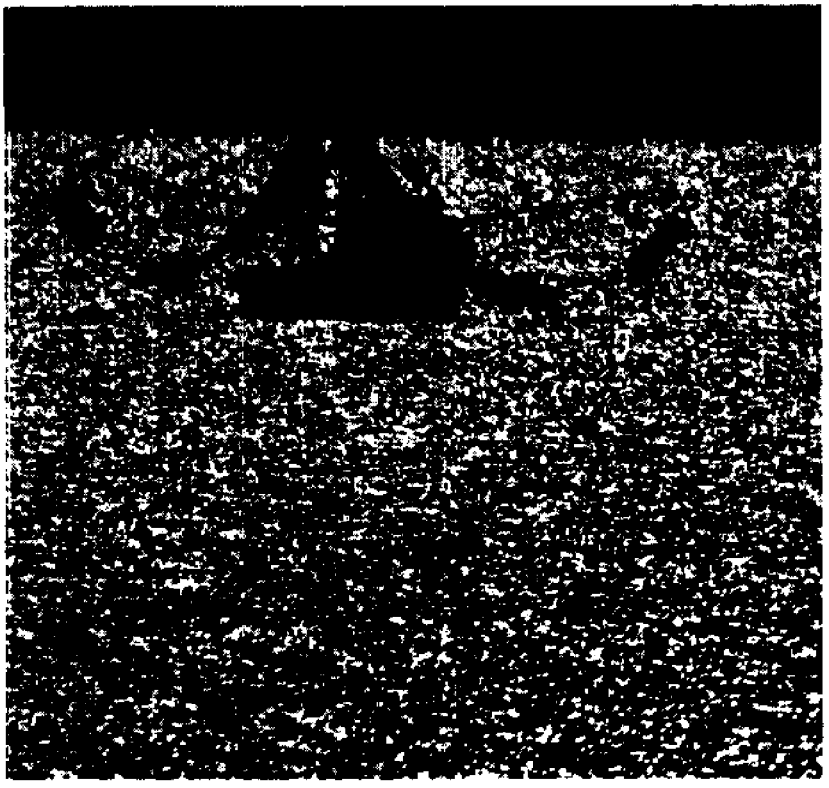
Congressman Robert L. Leggett, in the keynote address, outlined some of the tangible results and some of the problems ahead in the development of national policy pertaining to fisheries.

Panelists discussing the domestic outlook for implementing fishery management touched on the difficulties of determining optimum yield, the consideration given marine recreational fisheries, opportunities for regional management and cooperation, the new status of environmental considerations, and the new era in fisheries conservation, management, and production.

On the effect of extended jurisdiction on foreign fisheries, speakers outlined the repercussions for a major distant-water fishery off US shores, opportunities for US fisheries development and joint ventures, the implementation of 200-mile limits by the Canadian and Mexican governments, and the possibilities for a World Fishing Bank.

Opening Session

Session Chairman: Ted Rice



OPENING ADDRESS

Governor James B. Hunt, Jr.
State of North Carolina

We in attendance here are from many states and many nations. Yet we have many common interests and those bring us together. We are competing with each other in some cases for resources we once throught were unlimited, and--I would suggest to you--many of our people still believe are unlimited. That, of course, is part of the problem. I think it is imperative that we examine our situation together because we have so much to lose--and indeed have already lost so much--when we do not. We have everything to gain by managing our ocean resources fairly and wisely.

The livelihoods of many people in the State of North Carolina and in other states and nations depend on the catch of fishing fleets in waters here and all over the world. This includes the fishermen themselves, and we have many of them here today; it includes the fish processing companies and, ultimately, the people who eat the fish and/or use fish products. For many states and nations fishing is a major part of the economy and the people's diet. The constantly growing population puts ever-greater demands on the fish stocks. We know that fish stocks are being rapidly depleted.

Some of our North Carolina fishermen, for example, already have gone out of business, especially those who depended on river herring. For six years prior to the passage of the Fishery Conservation and Management Act (FCMA), our yearly herring catch in North Carolina declined from 20 million pounds to 6 million pounds.

Of course, these concerns have made us realize within our country and within our individual states that we absolutely must deal with this problem. Much of it must be with a national or worldwide perspective. And as I see what is beginning to happen in this field, I am reminded of how the people in this nation have responded when we have had previous threats to our very existence in the long run.

I grew up on a farm not very far from here--a dairy and tobacco farm. My father was a soil conservationist who is now retired. I know very well the story of how we as a nation realized that we were losing our soil resources and developed a strong and very successful pro-

gram to stem that loss, to rebuild the land--I have done that with my own hands--to ensure that we will continue to have an abundant land agriculture. That has been a success story for we the people of this land and of this state.

I know the story that we still are involved in, as indeed we are involved in all of these--of how the people of America are responding to problems of pollution in the air and in the water and elsewhere. We recognized a problem and we have begun to deal effectively with it, although we have so far to go. I would submit to you that you cannot see the great incidence of cancer in our people today--with no apparent cause--without strongly suspecting that the pollution throughout so many parts of our lives, indeed perhaps our whole environment, is largely responsible. We have begun to move to deal with pollution with strong laws, effective programs, and a commitment on the part of our people.

I would say to you here today, at this Governor's Conference on Fishery Management Under Extended Jurisdiction, that we in this nation and we in this state are particularly proud to be a part of this effort and hope to be leaders in it. We are beginning to see our responsibility to deal with the problem of managing the whole area of fisheries and the whole fishing industry as it pertains to our state, our nation, and indeed our world. Given the real threat of losing so much that is so important to us, the FCMA is in large part a response to a growing demand and a dwindling supply of fish. Before Congress passed the new 200-mile extended jurisdiction, it had been made law by several countries, as we know. The FCMA puts us on an equal basis with those countries and gives our fishermen the same chances that fishermen of other countries have. But more importantly--and I think we have come to realize this more recently, at least those of us who are laymen in this field--it provides ways for us to improve our situation. It provides systematic plans for managing fisheries stocks; it provides for Regional Fishery Management Councils so that the state and federal governments can work together. The FCMA also sets out criteria by which management plans can be judged. It includes requirements for research and the use of modern technology and management techniques in fisheries management--an area which has had so little of the application of these new techniques as compared to other areas within our economy.

Indeed, when we look hard and honestly at the commitment of resources to this field as compared to the other areas within our economy, we must recognize that

we have been grossly unfair and unwise. I believe very strongly that we should not be satisfied with simply talking about maintaining the status quo. I believe that with the imagination and ingenuity of man we can greatly increase the production of the seas as we have the production of the land.

I would urge you, particularly those of you who are part of the leadership of North Carolina, to have as your objective not simply maintaining the status quo, that is, not letting things get any worse than they have already become. I want us to aim at improving the situation. I want us to create a situation, and we cannot do it alone, in which we can greatly increase the production of fish. I think that can be done. It will not happen overnight, but it will never happen unless we have that kind of vision and that kind of determination and get about it. I would urge all of you to take that kind of large view; I would urge you to think about how we go about doing that. Because the populations of the world in the years to come will need it; it is a great resource which can be developed, if we will.

To my knowledge this is the first conference on this subject with as wide a scope as we are including today. The economic and, I believe, the moral questions which bear on this discussion are nearly as broad and as deep as the oceans themselves. Our knowledge of the ocean is not so broad, but our concerns in this area must not be just for ourselves in our own states and nations in our own time. We must consider how what we do today affects the future of the seas, the economic development of all our homelands, the lives of our children, and the lives of the children to come.

It was 485 years ago tomorrow that Christopher Columbus discovered America. And he proved that the world and the oceans are not flat. Now we have proved that the resources of the world's oceans are not boundless. Let us prove in the days and the years to come that we can work together so those resources will always be plentiful for the generations to come on this good earth.

Thank you, and I hope you have a most successful conference.

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UNILATERAL ACTION AND THE LAW OF THE SEA: A SYMBIOTIC RELATIONSHIP

Ambassador Thomas A. Clingan, Jr.
Deputy Representative, US Delegation
Law of the Sea Conference

As the title suggests, the juxtaposition of United States (US) legislation on fisheries conservation and management with the emerging text on the Law of the Sea (LOS) may be viewed as a symbiotic relationship. Symbiosis, Webster says, is "the living together in intimate association or even close union of two dissimilar organisms." In the sense that the US Fishery Conservation and Management Act (FCMA) is a product of national unilateral action, while the emerging treaty is the result of intensive multilateral negotiation, they are indeed symbiotic. While symbiosis can be undesirable, it also can be advantageous to one or both of the organisms and may even be necessary to them. That is the state we are in with respect to the evolving patterns of fisheries management. Not only have our two organisms been living together since April, 1976, but to a certain extent they have fed upon and stimulated one another so that a national position has been forced into being that might not have been forged if the process had been left to the one path rather than the other. This national position has now become a significant factor of US foreign policy and a respected guide to the conduct of other nations.

Two preliminary things need to be said about the emerging LOS text. First, the LOS negotiations were in large part responsible for the shape of the existing national legislation. A comparison of the provisions of each shows a strong parallelism, and one might even say that had we not been long involved in these negotiations, there could have been no unilateral legislation, for then we would have been deprived of the argument that all we were doing was institutionalizing emerging international law as a domestic matter. The second preliminary observation is that the trend set in the establishment of global fisheries management schemes will probably survive whether or not a successful treaty emerges from the LOS Conference. However, as we shall see, there are certain advantages to working under such a global umbrella.

I am not going to attempt today to undertake an article-by-article analysis of the treaty or close comparison with the text of the FCMA. Rather, I would

prefer to set forth the broad policy context against which such comparisons can be evaluated. It is clearly understood that a treaty, when finalized and ratified, would modify the US legislation to the extent it is not compatible. Thus, whether you believe the language of the treaty is better than or worse than the regime set forth by the FCMA, the future of fisheries management is closely linked to the existence or lack of an international agreement. Because of this linkage, I think it is appropriate briefly to run down the status of the Third United Nations (UN) LOS Conference, and point out the present obstacles that, from the US point of view, must be overcome to achieve success.

The conference completed its fifth substantive session in New York in mid-July. At that juncture, the US, along with more than 150 other participants, had devoted a total of 42 weeks to negotiation--work that often was frustrating, and always complex and difficult. This is to say nothing of the years of preparatory work undertaken in the UN Seabeds Committee prior to the convening of the conference in Caracas in 1974. The issues involved in the negotiations were not limited to resources, but ranged over the spectrum of ocean usage: navigation delimitation, international straits, archipelagos, islands, pollution, marine scientific research, and seabed mining, to name a few.

What has emerged from this massive effort is a text--a single working document that contains over 300 separate articles devoted to these issues--known as the Informal Composite Negotiating Text, or, simply, the ICNT. The ICNT, like its precursors, the SNT and the RSNT, does not represent an agreed upon text or draft treaty. It is, rather, the combined work of the president of the conference and the chairmen of the main committees, and it represents their personal views of where they perceive an ultimate compromise may lie--views which no nation need consider binding. It is a negotiating document for whatever use the conference should wish to make of it during any future session or sessions. But having issued that caveat, I must say that it would be misleading for any delegation to conclude that the ICNT is without status or substance. The document is the third iteration of the conference trends, and it would be risky for any delegation not to understand that each time a particular portion of the text is rewritten without change, it acquires new stature and brings the conference one step closer to final agreement.

The ICNT is a product of last summer's negotiations. We now have had a little time to study it and,

while final conclusions must await a more thorough governmental review, some initial thoughts about whether it has brought us closer to, or farther from, agreement can be voiced. The most significant of these thoughts emerged from Ambassador Elliot Richardson's press conference on July 20, 1977, immediately following the summer session. He said:

> The ICNT resulting from this session of the UN LOS Conference evidences real progress on vital issues relating to international security and freedom of navigation. At the same time it substantially sets back prospects for agreement on an international regime for the conduct of seabed mining. Both the substance of the text on this issue and the lack of fair and open processes in its final preparation require me to recommend that the US undertake a most serious and searching review of both the substance and procedures of the conference.

In response to questions, he has refused to rule out the possibility that there could be a decision to withdraw from further participation, although that is clearly only one of the many options. The strength of the language, however, does indicate the depth of US concern, and indeed the concern of many nations, over the procedures of the last session as well as concern over matters of substance in certain portions of the text.

The major difficulty from a US perspective, as Ambassador Richardson indicated, is with that part of the text dealing with ocean mining beyond the limits of national jurisdiction. This, of course, has no direct significance for those at this meeting, except that it does bear upon the possibilities for a successful conclusion of the treaty, and that does affect us. So, let us for a few moments bear upon the pluses and minuses. What is wrong from our perspective? Briefly, the problems in the present seabed mining text are as follows:

1. The text gives no reasonable assurance that companies or national enterprises wishing to go into seabed mining of manganese nodules will be guaranteed access to a mining site or mining sites by the International Seabeds Authority (ISA) to be established by the treaty.

2. The text could be read to make transfer of US technology a condition to access to a mine site by ocean miners.

3. It also could be read to give the ISA the power to force companies into joint ventures with the ISA as a further condition for access to the resource.

4. The financial burdens that might fall upon contractors conceivably could be so large as to make participation in mining impractical.

5. The text would give the ISA the power to regulate the production of minerals and to set prices.

6. It would place the real control of the ISA in the hands of a majority of nations, under a one nation--one vote rule, whether they had an interest in mining or not, thus failing to provide adequate protection for the minority of nations actually having the technology and capacity to mine.

7. It would permit the distribution of revenues from mining to countries that had not signed the treaty, thus giving benefits to those countries that undertook no corresponding obligations.

8. Finally, the text makes quite probable that, after a trial period, the dual-access system would be replaced by a unitary system where contractors could continue mining only by the grace of the ISA.

All this, taken together, would be analogous to asking us to agree to a treaty to supplant US authority with respect to fishing by a ponderous international organization with the power to extract boats, equipment, and capital, with no corresponding guarantee that anyone would be permitted access to the fish. Obviously, such an arrangement could not be acceptable to the US, and Ambassador Richardson has made that eminently clear.

One may well ask how it is that the US has gotten herself into such a mess, but that requires more time to explain than is available today. Suffice it to say that procedures for reaching an adequate compromise on this issue have thus far eluded our grasp.

Another problem area, for the US, has been the question of the conduct of marine scientific research in the economic zone out to 200 miles from the coast. Previous forms of the text favored strongly those coastal nations that desired to retain a total power to grant or to withhold consent of research projects in their zones. We have argued that such a regime makes possible arbitrary conduct and is neither in the interest of the development of sound research programs nor in the interest of the international community in general. Some small improvements were obtained this summer. Conditions under which consent might be withheld were more clearly spelled out, and there is now a provision making consent unneces-

sary if the research were being conducted as the result of an international agreement to which the coastal nation was a party. This is not to say that our scientific community is happy with the text. There are still substantial restrictions on the conduct of oceanic research.

Having pointed out major difficulties, I should be equally quick to point out favorable provisions. In terms of our primary national security interests, one would have to conclude that the overall impact of the present text is not bad. New provisions were negotiated which clarify the legal status of the economic zone--an issue that has been for some time a potential conference breaker. Coastal nations by and large pressed hard for an interpretation that increases coastal nation jurisdiction over the zone for most purposes, while the maritimes fought equally hard for a liberal regime that permits maximum navigation-related benefits in the zone. The new text, negotiated this summer, goes a long way toward reestablishing a proper balance and making it clear that the exclusive economic zone (EEZ), while protecting the coastal nations' rights with respect to resources and other limited matters, will not become the private sea of such nations to the detriment of the international community in general. While this new text is not universally accepted, there is ample reason to believe that embodied therein is an acceptable compromise.

One of the key issues for the US has been from the outset the question of freedom of transit through international straits. It was obvious that acceptance of a 12-mile territorial sea would mean that certain important straits, previously high seas, would then fall within the territorial seas of one or more nation. During this past session, articles providing for unimpeded transit in such special circumstances became clearly accepted by the vast majority of participating nations, and it now can be said with some assurance that the issue has been laid to rest. Likewise, provisions dealing with the new concept of archipelagic waters now appear broadly accepted.

Provisions dealing with the discharge of oil from ships and providing for new enforcement concepts also have apparently fallen into place.

The problem of how one delimits the outer edge of the continental shelf appears headed for an acceptable solution, although the trying problem of delimitations between opposite and adjacent nations is still unsettled. Clearly, this lateral and offshore boundary problem is a major one for a large number of countries, and the form of its resolution will impact on fisheries problems as

well as those of mineral extraction. A perfect example of this is the ongoing disagreement between the US and Canada with respect to lateral maritime boundaries. It is almost impossible to deal with fisheries management questions successfully in areas where those boundary disputes are in progress.

In the area of most interest to this group--fisheries--there were no changes in the ICNT over preceding texts. It is fair to say at this point that there seems to be widespread agreement on those articles dealing with coastal nation powers over coastal fisheries, although there has been no better understanding of the concepts involved than has developed in domestic application of fisheries policy. For example the concept of optimum sustainable yield has no firmer guidelines in the ICNT than in the FCMA; in fact they are the same. Likewise, there is no better understanding of the concept of a nation's catching capacity and thus of surplus. There is an additional problem in the LOS context not present in domestic law that eventually could have an impact upon the FCMA. That is the question of fishing rights of landlocked and geographically disadvantaged nations in the EEZs of their neighbor nations or of their region. This issue has been hotly contested between the coastal nation group on the one hand and the landlocked geographically disadvantaged nation group on the other. Since the US has no landlocked neighbors, this is not an issue for us. However, the possibility of the granting of preferences to geographically disadvantaged nations of a region could impact upon our fisheries, depending upon how that term is defined and what constitutes a "region." At the present this is not a difficulty, but it bears watching.

While there were no changes in the text dealing with highly migratory species (e.g., tuna) or anadromous species, there was in fact some activity. Tuna are exempt from the FCMA, while they are governed by regional arrangements in the draft LOS text. The existing article has proved unsatisfactory to both the coastal nations and the fishing nations; hence negotiations were conducted to seek an improvement. The interests are so diverse that no agreement on a replacement article was reached.

With respect to salmon, discussions also were held in New York. Those talks were at the instigation of the one nation that is disenchanted with the present salmon article. The talks involved both nations in whose waters salmon spawn and nations that fish them. The existing text recognizes a primary interest in salmon in the nations in whose waters they spawn. It also deals with the

question of a "high seas" salmon fishery; that is, one beyond the EEZ, permitting such fishery at a certain level for nations proving an economic dislocation if they were excluded. That exception was the result of intensive negotiation over a period of more than a year, and it was designed to solve the problem of a major fishing nation for which this is a serious difficulty and hence to enhance agreement. The advantage here is that broad agreement binds all signatories, thus effectively controlling new entries into the salmon fishery. While there is some general dissatisfaction among several nations regarding the salmon article, it is generally acceptable to the key nations, and remains unchanged.

The other question affecting fisheries is that of compulsory dispute settlements. Quite obviously, the way in which a nation behaves in establishing fishing regulations and designing management systems will be influenced if it understands that its judgments could be called into review. More specifically, the concern among coastal nations is that their judgment with respect to the acceptable level of allowable catch and the capacity of their own fleets might be second-guessed. Our position has been to support a certain level of fisheries dispute settlements, on the theory that while our procedures are sophisticated enough to make it unlikely that our judgments could be challenged, this might not be so in some waters where our own distant-water fleets might operate. Arbitrary conduct in those waters could result in forcing those fleets back into our own domestic fisheries (insofar as they are adaptable) out of self-defense. Our view thus has been that judgments on total allowable catch capacity and surplus should be open to challenge if totally arbitrary (but not if based on a modicum of evidence), and that such regulations as those setting gear restrictions or time and area closures should not. The drift, it seems, is more likely in the opposite direction and that the eventual text will contain little by way of limits on coastal nation discretion.

Back to symbiosis. How well are the "treaty" and the FCMA living together? How well do they line up? What will happen if there is a treaty, and if there is not?

Our legislation and the treaty, I am sure you have noted, are not in perfect alignment. Some substantive matters are different and, of course, the domestic management provisions of our law are not addressed on the international level--nor should they be. Every effort was expended to try to make the FCMA consistent with existing trends in the conference. But complete uniformity

was not possible under the law; the setting of allowable catch, catch capacity, and surplus is entirely discretionary with the US. The terms of the ICNT, however, provide that under certain circumstances judgment could be taken to compulsory dispute settlement. Our law excludes highly migratory species from its operation, while the text calls for regional management. In addition the legislation provides for exclusive US management of anadromous species throughout their migratory range, except in the EEZs or territorial seas of other countries, where such zones are recognized by the US. There is no exception for cases of economic dislocation as appears in the ICNT. There are other differences, but the aforementioned are major.

If there is a treaty, of course, it becomes upon ratification the law of the land. The legislative history of the law makes clear that the FCMA was intended to be interim, pending the conclusion of an LOS treaty that protects US fishing interests. The FCMA provides that the Secretary of Commerce, after consultation with the Secretary of State, will amend any regulation as necessary and appropriate to conform with the new treaty. That may be a good result, or a bad one, depending on where you are fishing and what protection you may expect.

The other line of inquiry deals with the "no treaty" situation. On the one hand it can be argued that there is no international law on the subject if there is failure to agree on provisions for an EEZ. This would leave any preexisting rules of law to apply. It also can be argued that the unilateral action of the US, Canada, Mexico, Norway, Japan, the Soviet Union, the European Community, and others supports the contention that the concept of the EEZ is now customary international law. Of course, with different countries claiming different things, it leaves the question open as to exactly what kind of a zone is being considered. In such a situation a certain amount of political conflict becomes possible, and the nature of the law is necessarily vague and lacking in identifiable substance. The questions become: Who would be bound by the law? What would be the accepted international norm?

From at least one point of view there may be every reason to prefer the FCMA to the treaty. But the offsetting advantage the treaty offers is the promise of universal acceptance of the provisions, and thus uniformity on a global scale.

Finally, what are the odds that the treaty will become a reality? I cannot in all honesty, answer with any degree of assurance. I have tried today to indicate

the severe problems that remain to be resolved if certain portions of the text are to be acceptable to the US. The review that will help the government to make the appropriate decisions is underway. Each of the many interests the US may have in the oceans is being evaluated in a treaty/no-treaty context, and conclusions with respect to our future course of action then will be taken. Whether any text that eventually emerges from the negotiations can be considered acceptable must be a decision that can be made only when the conference concludes, for only then can there be a judgment on the totality--the good parts and the bad.

Regardless, we have to say the conference has brought us a long way toward a better understanding of emerging concepts of ocean use and management. Many of those concepts will survive with or without a treaty. Without the negotiations it is conceivable that the fisheries zone would still be an academic exercise. Thus, from any standpoint the work has already paid benefits. I trust that each of us is aware of the importance of that fact and that we will continue to work toward the support of a successful progression toward a widely acceptable international solution to the problems, a solution with which we can all live.

EMERGING POLICY FOR THE MANAGEMENT OF UNITED STATES MARINE FISHERIES

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The living resources off our coasts have always been an important source of food and recreation for the nation--and many of our coastal communities were settled because there was an abundant supply of fish nearby. For a substantial number of these communities, commercial fishing still is an important source of income. Moreover, recreational fishing provides food and pleasure as well as income to more than 30 million of our citizens each year. Despite the importance of these resources, we have had few tools to establish effective fisheries

management regimes on a national basis. Unlike the governments of major fishing nations, including Canada, the United States (US) government has no management role or authority, except under laws implementing international agreements. But in recent years, because of intensive foreign fishing off our New England, Alaskan, and Pacific Northwest coasts, which in several cases severely reduced the stocks of fish, there was growing demand for action by the Congress.

The Congress acted to pass the Fishery Conservation and Management Act (FCMA) in 1976. It had already enacted the Marine Mammal Protection Act (MMPA) in 1972 and the Endangered Species Act (ESA) in 1973. The latter two acts are jointly administered between the Department of Commerce/National Oceanic and Atmospheric Administration (NOAA) and the Department of the Interior. I believe these laws provide a working base for stewardship of the living marine resources in our coastal waters.

The FCMA provides a means to control fishing within 200 miles of our coasts and in some instances beyond. It does this through a calculated balance between local interests, well represented on newly established Regional Fishery Management Councils (RFMCs), and national concerns for which the Department of Commerce is responsible. The FCMA bases management on plans developed by the RFMCs and approved by the Secretary of Commerce for each fishery. These plans consider not only the conservation needs of the resource but also may consider various interests--commercial, recreational, environmental, and consumer--in determining the "optimum yield" (OY) of each fishery.

The MMPA established a moratorium on the taking of marine mammals, and it banned the importation of marine mammals and of their products, with certain exceptions. The MMPA also established a goal that the incidental kill or serious injury of marine mammals taken in the course of fishing operations be reduced to insignificant levels approaching zero mortality and injury rate. The impact of this provision has been enormous, especially in the tuna industry, and great controversy has arisen from it. Another controversial part of this legislation transfers responsibility for the protection of marine mammals, no matter where they are located, from the states to the federal government until such time as the states submit plans for management regimes that conform with the requirements of the MMPA.

The third piece of legislation, the ESA, provides a powerful means for conserving endangered or threatened species of plants or animals.

In addition to these three acts, a substantial array of legislation exists which affects one or another aspect of managing and utilizing living marine resources. Some of the more significant of these are the Coastal Zone Management Act; the Marine Protection, Research and Sanctuaries Act--better known as the Ocean Dumping Act; the National Environmental Policy Act; and the Fish and Wildlife Coordination Act.

To manage our marine resources efficiently and in the full interests of the nation, the implementation of these acts and related legislation must be integrated into a well-balanced and comprehensive program. The Department of Commerce's approach to this has been to work with the fishing community to develop a basic policy expressed in the National Plan for Marine Fisheries (Anon., 1976). This plan contains a mission statement for our fisheries: "to optimize the economic, social, and aesthetic values of fisheries to the nation, consistent with maintaining fisheries resources for the future." This mission is supported by four goals that cover the main national concerns for the conservation, management, and utilization of marine fisheries: (1) restore, maintain, enhance, and utilize in a rational manner fisheries resources of importance to the US; (2) improve the contribution of marine resources to recreation and other social benefits; (3) develop and maintain healthy commercial and recreational fishing industries; and (4) ensure adequate supplies of wholesome seafood products for consumers.

The general thrust of these goals and the plan that was built upon them have been supported in several studies sponsored by the US Congress dealing with specific fishery questions. These are the Eastland Fisheries Survey, two reports by the General Accounting Office of the US fishing industry, and one by the Office of Technology Assessment on establishing the 200-mile Fishery Conservation Zone (FCZ). The three acts--FCMA, MMPA, and ESA--laid a basis for reaching these goals.

The FCMA is the broadest and the most significant fisheries legislation passed in the history of the US to protect the future of our fisheries. The FCMA, which came into full force in March, 1977, offers a strong conservative regime coupled with guidance as to allocation among users.

Even in its short existence, the FCMA has brought about major changes in our fisheries. Foreign fishing in 1977 was reduced to approximately three-quarters of the 1976 level in an effort to meet conservation needs

and make the resources available to our domestic fishermen to the fullest extent of their capabilities. The RFMCs now are well organized and have commenced to fulfill their primary role of developing fishery management plans. Fourteen preliminary management plans are in effect for 1977 and are being amended for the 1978 season. In addition, RFMCs submitted and the Secretary approved two other fishery management plans.

The MMPA and the ESA have protected certain living marine resources previously threatened with excessive exploitation by shielding them under a strong protective regime. The protection of porpoise in the yellowfin tuna fishery has received much publicity in recent years and has increasingly altered that fishery over the past three years. However, other species have received protection under both MMPA and ESA. These include various species of whales, seals, and shortnose sturgeon as well as the Atlantic Ridley, hawksbill, and leatherback sea turtle.

It appears that these acts should interact well, and that they provide a comprehensive means of managing living marine resources. But this is not completely true. In the course of their implementation several important questions have surfaced which should be resolved before we can have a complete and consistent policy to guide our management actions.

First, the process of developing, reviewing, and implementing fishery management plans (FMPs)--which is the heart of the FCMA--has raised issues that have not been fully reconciled. One of these is the application of the OY principle. The FCMA defines OY as the amount of fish that (1) will provide the greatest overall benefit to the nation, with particular reference to food protection and recreational opportunities, and (2) is based on the maximum sustainable yield, as modified by relevant economic, social, or ecological factors. This concept of OY is intended to ensure that the many demands upon a fishery resource are considered in a balanced fashion. Thus, the need to restore or conserve the resource itself is to be considered together with the needs of the commercial fisheries, the recreational interests, the consumer interests, and other affected groups. Often these interests are in conflict. For example, when a reduction in fishing effort is required to restore resources, how should the burden be spread among commercial and recreational fishermen? Trawl gear permitted in some areas may reduce juvenile populations of a nontarget species, thus threatening future stocks, or its use may conflict with fixed gear employed in another fishery.

To arrive at an OY the objectives for the fishery must be clearly defined and alternative strategies to meet these requirements must be proposed and analyzed in terms of how they might affect different interests. These demands can be met adequately only with sufficient biological, economic, and social data and the development of satisfactory techniques for performing the analyses. When the alternatives have been evaluated, the decision still must be made to select the most desirable course among the alternatives. This is a matter of judgment, since it involves balancing the various demands on the fishery. As part of this public process for seeking an optimum solution to conflicting needs, the RFMCs are required to seek a wide expression of public opinion to help them to form final judgment on each fishery.

Not everyone will be satisfied on all occasions with the recommendations of the RFMCs. It is possible too that the RFMCs' judgments may not always coincide with those of the Secretary of Commerce, who is called on to review and approve the plans for consistency with the national standards, other provisions of the FCMA, and any other applicable law.

As a first step to help avoid any differences between the RFMCs and the Secretary, efforts have been initiated to develop uniform guidelines and criteria that RFMCs can use in considering OY and in estimating US fishing capacity. While it is hoped that appropriate guidelines can soon be developed to address such issues, the manner in which we arrive at sociopolitical decisions will take a long time to evolve. Certainly the process will require much patience and objectivity on the part of those involved.

A further problem with the plan review and approval process is that the various procedural requirements make the review process very lengthy. It is estimated that after the RFMC has developed a plan and submitted it to the Secretary along with a draft environmental impact statement to carry out fully the various provisions of the FCMA, it will take at least 170 days to implement the plan with regulations. While this may appear to be an excessive amount of time, it should be remembered that most of the plans propose management regimes which can have tremendous impact on the resources, on fishermen, on local economies, on consumers nationwide, and on our international relations. Decisions on such important matters need full public input and must not be made hastily. However, in another 12 to 18 months we will have a better perspective from which to decide if and how the plan review process can or should be modified.

It must not be forgotten that, under the FCMA, the secretarial review also must consider compliance with other laws, as well as additional policy aspects where appropriate. Nonetheless, there remains legitimate concern that amending plans annually, as may be needed in some fisheries, means excessive work and delay. Some proposals have been suggested for writing plans that can meet the necessary legal requirements but may cover a span of some years.

A second issue of concern is that under the FCMA the Secretary of Commerce has authority to enforce regulations only for stocks of fish harvested outside state waters, unless the fishery is predominantly within the FCZ. Except in this latter case, neither the RFMCs nor the Secretary of Commerce can require a state to implement an RFMC-approved plan within its territorial sea, since the FCMA left essentially unchanged the authority of the coastal states to regulate fisheries within the territorial sea. Inland waters, such as Cape Cod Bay, Mobile Bay, and Puget Sound, are not even covered by the FCMA. Attempting to manage interstate fish stocks through the disparate state and local political jurisdictions has been a major weakness in the US system. The FCMA does little to correct this weakness for a number of important stocks.

The magnitude of this problem is better understood when one recognizes that the resources involved include some of our most important and valuable commercial and recreational fisheries: at least 50 percent of the domestic commercial harvest and approximately 80 percent of the recreational catch are involved. Examples are menhaden (the largest volume fishery in the US), striped bass (a major recreational species found off every coastal state from Maine to Washington and a commercial fish in some states), and shrimp in the Gulf of Mexico and the South Atlantic (our most valuable fishery). In the past this lack of uniform management for many interstate fisheries has caused user conflicts and resource depletion.

A solution may be found through the cooperative efforts of the RFMCs and the states. If this does not occur, changes in the management regime should be considered. These might include (1) extending the authority of the Secretary to implement RFMC plans that manage interstate stocks, (2) strengthening the authority of the Interstate Marine Fisheries Commission to establish management regimes, and (3) the creation of new management entities parallel to the RFMCs to coordinate the states' management of these resources. To assist in

examining this question further, possible alternatives are being studied--on which advice from concerned groups will be sought.

A third issue requiring further examination is the need for closer coordination between the FCMA and the Coastal Zone Management Act (CZMA), which provides funds to states for programs and plans that contain "objectives, policies and standards to guide public and private uses of lands and waters in the coastal zone." The protection of fishery habitats and the development and implementation of state fishery management plans are included in the scope of the CZMA, which encourages two or more states to implement unified coastal zone management policies through "executive instrumentalities or agencies" and provides for federal grants of up to 90 percent of the cost of establishing and maintaining such instrumentalities. This is an opportunity and a challenge for the RFMCs and the states to work together in seeking uniform fishery management regimes, both inside and outside the FCZ.

Another reason for close coordination between RFMCs and state Coastal Zone Planning Offices is that, once a state coastal zone plan is approved by the Secretary, activities conducted, controlled, or supported by federal agencies shall be, to the maximum extent practicable, consistent with the state plan. This consistency requirement could place limitations on the work of the RFMCs in their preparation of fishery management plans, even for stocks harvested predominantly beyond state waters.

A further problem relating to the protection of fish stocks through management plans is how to assure and maintain adequate habitats for fish resources. Under the FCMA, RFMCs should identify existing programs directed to the protection of habitats. Upon approving a plan having habitat recommendations, the Secretary will implement those recommendations for which the Department of Commerce has statutory authority. She will direct the remaining recommendations to the agencies having the appropriate authority to deal with them, such as the states concerned, the Departments of Interior and Defense, and the Environmental Protection Agency. Using procedures already established, National Marine Fisheries Service Regional Offices will urge such agencies to implement those habitat recommendations of the RFMCs which have been approved by the Secretary.

Beyond this, and under certain conditions, the Department of Commerce has the authority to establish estuarine sanctuaries under the CZMA and marine sanctuaries under the Marine Protection, Research and Sanctuaries

Act. In the past these programs have not been funded; but, since President James E. Carter mentioned the need to establish marine sanctuaries as part of his environmental message, this program may very well receive financial support in the future. A task force has been established in NOAA to consider potential sites and priorities. This information then will be sent to the RFMCs for review.

An issue for future consideration in marine fishery management is how to deal with highly migratory species of tuna which are excluded from the management authority of FCMA. In the Law of the Sea (LOS) negotiations the US has pushed for an international regime to manage tuna stocks, but an early resolution of this issue in LOS is doubtful. Two international treaties now provide some protection for yellowfin tuna and/or bluefin tuna off the Atlantic and Pacific coasts. Other species, such as Pacific albacore and Pacific bluefin tuna, are partially managed in the US by the affected states when those tuna migrate through their waters. But world interest in the fishing of tuna is growing rapidly, especially among the Latin countries that border the eastern and southwest Pacific. The US may expect increasing international competition for the harvest and control of these resources. Our commitment to international management of tuna, by excluding them from management under the FCMA, is consistent with the US urging other nations to take the same basic approach, i.e., international regimes. Nevertheless, as circumstances change our policy will need continuous reassessment.

Concern about the protection of marine animals is having an increasing impact on marine conservation regimes, and this is affecting the nature and the cost of commercial fishing activities. A principal manifestation of this concern is the conflict between protection of marine mammals and man's use of other living marine resources.

Marine mammals have been an object of commerce as far back as human history and legend take us. Often marine mammal resources have been overexploited, resulting in some depleted and a few exterminated populations. The ruthless harvest of the great whales, to the point of near-extinction for several species, has been a major rallying point for those concerned with the total protection of wildlife.

The MMPA established as national policy an environmental ethic calling for nearly total protection of marine mammals through a concept of "optimum sustainable

populations" of the mammals while maintaining a healthy and stable marine ecosystem. Most marine mammals found in state waters and the FCZ are now protected from killing, taking, and harassment.

The MMPA places marine mammals in a special position among animal groups in the ocean ecosystem, thus making them essentially inviolate. Such protective measures mean that some groups of fishermen whose activities involve the incidental catch of marine mammals are in conflict with the laws resulting from the philosophy of total protection of marine mammals from commercial and recreational fishing. The tuna/porpoise problem is only one consequence of this new philosophy.

We are currently dealing with the issue of whether bowhead whales should be completely protected at the expense of eliminating traditional Eskimo whale fisheries in Alaska. More such issues undoubtedly will be identified in the future. For example, the fisheries for salmon are affected by predation and gear destruction from sea lions. Over a long term this may have a significant effect on salmon yields and fishermen's income. The same kind of predatory relationship exists with respect to Antarctic krill and baleen whales, between Alaska pollock and North Pacific fur seals, and between sea clams and walruses in the Bering Sea.

Such conflicts between environmentalists and fishermen raise issues fraught with tensions and emotion. Yet, unless we resolve the underlying philosophical and management differences, they will continue to be a source of conflict and confusion, which can reduce the effectiveness of both the FCMA and the MMPA to the detriment of the fish, the mammal resources, and US consumers. The solution proposed by some people would be to amend the MMPA to be consistent with the approach set forth in the ESA. Although this would probably not be satisfactory to the more extreme views of certain environmentalists and fishermen, it would give strong protection to marine mammals--in some cases more protection than they receive under the present laws.

We are becoming more aware of the complexity of the requirements of fisheries management regimes. We cannot, for example, develop an OY for Alaska pollock without considering the food requirements of the North Pacific fur seal, the abundance of other groundfish in the same area, and the options fishermen have in fishing for them. Or, when considering the amount of herring necessary as forage for haddock, we cannot ignore the fact that herring also are significant predators on young mackerel,

cod, haddock, and other species of interest to commercial and recreational fishermen.

In short, we need to be moving toward management of total ecosystems. We have only modest capabilities to do so at present, yet this is the direction we must take. We will need to be concerned with the interrelationships among different populations of fish and marine mammals, and of the whole web of life in the oceans and the estuaries. We need to consider not only the resources, but their physical environment and their impact upon man's other activities in the marine ecosystem. We need to be concerned not only with the harvests from commercial fishing, but with the other uses of fish. We need to consider the welfare of humans who harvest fish for food and recreation, those who process and consume fish, as well as those concerned with environmental interactions in their harvest. This great complexity means that more interest groups will have to become involved in decision-making.

The needs of recreational fishermen and environmentalists are not generally recognized, though recognition does not mean the conflicts are resolved. Not so clearly recognized nor perhaps as readily perceived are the demands of consumers. Consumer interests generally have not been taken into account in the development of conservation and management schemes for marine resources. To document this we need only to observe the rise in prices of fish products, which in some cases can be directly attributed to management actions. Development of OY means that, along with the obvious interests to be evaluated, we must also consider the rights of consumers when conservation policy is developed.

All of this means that we have entered into a whole new era of ocean use. Other needs and philosophies are crowding in on our long-established practices. Nonetheless, the most fundamental issue of all is still unchanged. That is, how to allocate and to whom--how to allocate the space, the environment, and the resources; and how to do it in the simplest, most effective, and most equitable manner possible. Our complex task, therefore, is to ensure that the national policies relating to all of the intermeshing interests associated with the sea and its resources are compatible, and that we carry out these policies in ways that serve our nation best. Our strategy must be to make the best use of the legal and administrative tools we possess. These tools are far more sophisticated and powerful than they were in the past, and we have every right to be optimistic about our ability to make wise and rational use of the sea.

Reference

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UNITED STATES DISTANT-WATER FISHING INTERESTS AND THE FISHERY CONSERVATION AND MANAGEMENT ACT

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The extension of United States (US) fisheries jurisdiction to 200 miles has had a substantial impact on the responsibilities of the Department of State with respect to international fisheries.

Less than one year ago, the waters beyond 12 miles of the US coast were essentially free for fishing by any nation. The fisheries off our coast were managed by a series of international agreements. The US was party to over a dozen bilateral agreements with a number of countries. These agreements specified amounts of fish that could be taken, restrictions on when and where foreign fishing could take place, and other conservation measures required of foreign fishermen. The US also was party to international fisheries commissions, such as the International Commission for North Atlantic Fisheries (ICNAF) and the International North Pacific Fisheries Commission (INPFC). Now, the bilateral agreements have all expired; we have withdrawn from ICNAF; and we have given notice of our intention to withdraw from the INPFC. These agreements to manage fisheries have all been replaced by Governing International Fisheries Agreements, or GIFAs as they have come to be popularly known, which are not management agreements. These agreements are essentially statements of principles, in which US management authority is recognized, and which allow the foreign nation party to the agreement to make application to fish for specified fisheries off the US coast. Then, if the US fishery management plan prepared for that specific fishery provides for a surplus above what US fishermen can catch, all or a portion of that surplus can be allocated to the foreign nation. The US has now signed GIFAs with 12 countries: Poland, the Republic of China, the German

Democratic Republic, Romania, the Soviet Union, Bulgaria, the Republic of Korea, Japan, the European Economic Community, Spain, Cuba, and Mexico. The US Department of State has been very busy during the past year negotiating these GIFAs.

The extension of US fisheries jurisdiction to 200 miles has clearly had a significant impact on US coastal fisheries. The US, and more particularly the Regional Fishery Management Councils (RFMCs) and the National Marine Fisheries Service (NMFS), now has virtually a free hand in determining the terms and the conditions relating to foreign fishing off the US coast. The Fishery Conservation and Management Act (FCMA) of 1976--in addition to providing for the sound conservation of US fisheries--is intended to benefit US coastal fishermen, and it appears to me that it will have this effect. But the FCMA also will have a significant impact on other US fishermen for whose benefit the FCMA was not intended. I am referring to US fishermen who traditionally fished off the coasts of other countries that also have claimed a 200-mile fisheries jurisdiction. The US Department of State will continue to be quite active in negotiations with these countries in seeking access for US fishermen. We are under no requirement in this area to negotiate GIFAs or any other specific kind of agreement. In the same manner we once proceeded for fisheries off the US coast, the Department must negotiate for US distant-water fishermen agreements that vary widely in form and content. While it is too early to judge the impact of the 200-mile fisheries jurisdiction on US fishermen operating off foreign coasts, let me recount what is at stake and what we have been doing in that area.

The first agreement the US negotiated for access to fisheries within 200 miles off the coast of another country was with Mexico. Mexico extended its fisheries jurisdiction in August, 1976, a few months after the passage of the FCMA. The extension of jurisdiction by Mexico has had a significant impact on a number of US fishermen who catch nearly $50 million worth of fish off the Mexican Gulf and Pacific coasts. United States fishermen for some 50 years have fished for shrimp and snapper-grouper in the Gulf of Mexico, and tuna and a variety of finfish in the Pacific. In addition, an important US sports fishery operates off Baja California.

The US/Mexican Fisheries Agreement--a detailed and complex document--sets forth the terms and conditions under which US fishermen participate in each of these fisheries. Generally speaking the agreement is a good one for US fishermen, since it provides for access to

Mexican fisheries in basically the same manner as before, albeit after payment of a license fee. The exception to this is the impact of the agreement on US shrimp fishermen. The provisions concerning shrimp provide for the phaseout of all US shrimping off Mexico by 1980. According to Mexico, its fishermen can utilize all the shrimp off the Mexican coast now and the phaseout is intended only to avoid an abrupt dislocation of a traditional US fishery. A provisional maritime boundary agreement also was negotiated with Mexico, using the principle of equidistance to determine the limits of each country's jurisdiction, since there are places where the 200-mile lines overlap.

One area of the world where 200-mile jurisdictions create a great deal of international activity is in the Caribbean, where numerous islands in a relatively small area give rise to a patchwork of reduced national zones. The US has some small but important fisheries interests in the Caribbean, primarily affecting fishermen from the Virgin Islands and Puerto Rico. In the Virgin Islands, US fishermen were affected by the extension of jurisdiction in January of this year by the British Virgin Islands, which are an integral part of the Virgin Islands chain and are closely associated culturally, socially, and economically with the US Virgin Islands. British Virgin Island fishermen also were affected by the extension of jurisdiction off the US Virgin Islands. Small-boat fishermen from both areas have traditionally fished freely throughout the area. In some places only a fraction of a mile separates the US and the British Virgin Islands. In May of this year the US and Great Britian negotiated a fisheries agreement which essentially provides for continuation of the traditional fishing pattern. A minute to the agreement spells out in detail the traditional patterns and terms of fishing in the area. Unlike the Mexican agreement, the Virgin Island Fisheries Agreement is a treaty, and as such must be ratified by the Senate.

Another area in the Caribbean affected by the 200-mile extended fisheries jurisdiction that has an impact on US fishermen is off the coast of the Dominican Republic. Puerto Rican fishermen traditionally have conducted a small fishery for finfish off the easternmost coast of the Dominican Republic, which is less than 50 miles from the Puerto Rican island of Mona. In July of this year the Dominican Republic extended its fisheries jurisdiction to 200 miles and, for Puerto Rican fishermen to continue operating as in the past, it is necessary that the US negotiate a fisheries agreement with the Dominican Republic. The agreement probably will be modeled after

the Mexican agreement rather than the reciprocal Virgin Islands fisheries treaty. There also is a maritime boundary question involved between the Dominican Republic and Puerto Rico, and the negotiation will be complicated by the fact that one of these areas, where Puerto Rican fishermen would like to fish, is in dispute among the Dominican Republic, the Turks, and the Caicos Islands, which are British. Negotiations are scheduled to begin before the end of the year.

An additional area in the Caribbean where US fishermen have an interest in fishing is off the Bahama Islands. United States fishermen have been prohibited from fishing off the Bahamas for spiny lobster since the summer of 1975, when the Bahamas claimed jurisdiction over the lobster as a creature of the continental shelf, following similar action by the US with respect to the American lobster. A few months ago the Bahamas extended its fisheries jurisdiction over all fisheries to 200 miles, and we have asked the Bahamas to enter into discussions on fisheries as soon as possible. United States fishermen who fish finfish in areas now under Bahamian jurisdiction are affected by the extension to 200 miles, and also would like to explore again the possibilities of fishing for spiny lobster. This negotiation may be complicated by the maritime boundary question, which arises because of overlapping jurisdictions by the Bahamas and the US.

Other fisheries issues in the complicated and fascinating world of the Caribbean which we may face later on arise from Virgin Island fishermen fishing off Saaba Island--which is owned by the Dutch; and as a result of US fisheries interests off Navassa Island--which is claimed by both the US and Haiti.

Another area of interest to US fishermen is the waters off northeastern South America. Our shrimp fishermen have been operating for a number of years off Brazil, French Guiana, Surinam, and Guyana. Brazil has claimed a 200-mile jurisdiction for a number of years, and US shrimp fishermen have been fishing for nearly six years under several different agreements that have spelled out the terms of access for US fishing vessels. The last round of negotiations took place early this year when, unlike previous models, an agreement was concluded that took into account US recognition of Brazil's fisheries jurisdiction to 200 miles. The agreement expires at the end of the year, and it is not clear what kind of arrangement will prevail for next year and beyond. Brazil has indicated that it will insist on allowing continued foreign fishing only under a joint-venture arrangement. The US industry involved in the area is prepared to explore

joint-venture possibilities, but it is not clear if an acceptable arrangement can be concluded. At the time of the first US/Brazil shrimp agreement, nearly 240 US vessels were fishing in the area. Now fewer than 100 catch shrimp off Brazil.

Early this year French Guiana--where these same US shrimp boats are based and where they also fish--extended its jurisdiction to 200 miles as part of a collective action by all the nations of the European Community (EC) and their various overseas territories. United States fishing vessels are presently operating under the terms of a free licensing arrangement installed on a temporary basis by the EC. This arrangement will terminate at the end of the year, and some more permanent arrangement must be negotiated. Action also must be taken to ensure US access to shrimp off Surinam and Guyana, which recently have passed 200-mile fisheries legislation.

Let us now leave the issue of US fishermen fishing coastal species off foreign shores to discuss the plight of another group of US fishermen who fish within 200 miles of a number of countries. I refer to the US fishery for tuna, which is one of the nation's most valuable and important fisheries. At the heart of the tuna problem is the fact that the FCMA excludes tuna as a species over which we claim exclusive management authority, but no other country off whose coast we fish tuna has a similar exclusion in its 200-mile claim. It is generally agreed that an international organization is required for the effective conservation and management of the wide-ranging tuna, which travel off the coasts of dozens of countries and thousands of miles out to sea. It also appears, however, that the present international conservation body for the eastern Pacific--the Inter-American Tropical Tuna Commission (IATTC)--will be replaced by a new organization. I have just returned from San Jose, Costa Rica, where a conference of plenipotentiaries, sponsored by Mexico and Costa Rica, was convened for the purpose of considering a new treaty. These negotiations are difficult and it may be some time before a new treaty is concluded. United States fishermen, vessel owners, processors, allied workers, and consumers, all have an important stake in this fishery for tuna. We also have an interest in the protection of porpoise, which are accidentally killed during purse-seining for tuna.

The renegotiation of the IATTC has just begun, and it is not clear what might eventually be achieved, particularly with respect to the allocation of the tuna resources. The coastal nations are demanding that a larger

share of the available tuna be allocated to them under a system of special preferences based on historical catches inside 200 miles of the coastal nations. Most of the schemes some coastal nations of the region are proposing could eventually reduce the US share of the international catch from its present 75 percent to around 50 percent. While tuna allocation is the most critical aspect of these negotiations, there are other important issues, such as membership, voting, enforcement, porpoise conservation, and others, that also must be addressed. Whatever happens, it appears that we will be actively involved in the international aspects of tuna fishing for some time.

Our activity in the tuna area is not limited to the eastern Pacific Ocean, for the US tuna fleet ranges widely throughout several of the world's oceans. In the South Pacific area the negotiation of a new fisheries organization is just beginning; and we may someday need to prepare a new treaty dealing with tuna fishing in the Atlantic Ocean, although it is our view that the present Convention is perfectly adequate for the time being.

I mentioned earlier that it is too soon to judge the impact of 200-mile jurisdictions on US distant-water fisheries, but certain trends appear clear. With respect to US fisheries for foreign coastal species, it would seem inevitable that such fishing will become more difficult and more expensive, and in some areas it may not be possible to continue access indefinitely. I believe there will be more of a long-term interest in areas where there is a reciprocity of fisheries interests, such as off Mexico, the Virgin Islands, and perhaps eventually the Bahamas and the Dominican Republic. United States fisheries off Canada also are reciprocal in nature. I purposely did not include them in my recounting of US distant-water fisheries interests because Canadian/US fisheries are such a specialized case and are being driven by a different set of imperatives.

The US fisheries for tuna are also a special case for different reasons, and it would appear that this most highly international of fisheries will be significantly affected by 200-mile jurisdictions. It will still be possible to maintain a large and significant US fishery for tuna, but inevitably there will be important changes in the present regulatory and management program.

To a very real extent the future of US distant-water fisheries may be affected by how we in the US implement our own extension of jurisdiction with respect to foreign fishing off US shores. The standards we use in imple-

menting this law are very important. The best and most objective science must be used in estimating allowable yields from US fisheries. We must be realistic and fair in the estimation of US harvesting capacities. We must strive for some objective and fair definition of OY and ensure that it is not used simply to exclude foreign fishing. We must ensure that US regulation of foreign fisheries is accomplished in an equitable and objective manner and that measures and restrictions are not established which have the effect of making it virtually impossible for foreign fishermen to operate economically. We must adopt an evenhanded approach. If surpluses exist, they should be made available for foreign fishing in a good-faith manner. United States fisheries should be managed according to a high set of standards and principles that can withstand objective international scrutiny. And the rest of the world is indeed watching us closely.

We should approach fisheries management in the manner I have described, not only as a matter of simple equity and international responsibility, but also because there is an important relationship between how we treat foreign fishing off our own coast and how we can expect foreign nations to treat US fishermen operating off their shores. The extension of fisheries jurisdiction to 200 miles will undoubtedly benefit US coastal fishermen. I expect those US fishermen to prosper, and I encourage and support the development and growth of US coastal fisheries. The challenge is to see that all this is accomplished according to high and objective standards. It is a challenge that will be met. The US approach to fisheries management is in a sense a unique experiment, an experiment that can work and can serve as an international example of sound and responsible fisheries management.

FISHERY CONSERVATION AND MANAGEMENT ACT ENFORCEMENT: A COAST GUARD PERSPECTIVE

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"Extended jurisdiction" became a reality when the Fishery Conservation and Management Act (FCMA) of 1976 was signed into law on April 13, 1976. The FCMA created a 200-mile Fishery Conservation Zone (FCZ) in which the

United States (US) unilaterally formulates fishery management plans and enforces those plans.

Management plans, no matter how well conceived or scientifically justified, cannot achieve the intended conservation objectives without a vigorous enforcement effort to include a comprehensive patrol, boarding, and inspection program and judicious collection of catch and effort data. The Coast Guard (CG) and the National Marine Fisheries Service (NMFS) are jointly responsible for enforcement of the FCMA. The fisheries management and marine biology expertise of NMFS, combined with the general law enforcement and maritime operational capabilities of the CG, provide the key enforcement element which has made the FCMA's conservation program successful where previous conservation regimes have failed.

Coast Guard and NMFS involvement in fisheries enforcement is nothing new. The CG had been patrolling some half-million square miles of ocean. Thus, while the 200-mile FCZ brought about a major geographical expansion to over 2 million square miles, the most significant aspect was the new authority which accrued to operations already in progress. Unlike the previous international arrangements, the FCMA authorized boarding and inspection of all foreign vessels fishing within the 200-mile zone. Before, enforcement often depended on foreign cooperation, which was not always forthcoming; in some cases boardings could be undertaken only with the permission of the foreign fishing vessel's master. Now, submission to boardings is mandatory. Refusing to allow and to assist an enforcement boarding subjects a fishing vessel to a stiff penalty.

Enforcement Concept

When extension of jurisdiction appeared inevitable in the early 1970s, the CG analyzed several enforcement alternatives. We considered a picket-line approach, utilizing cutters every 60 miles along the FCZ perimeter with aircraft patrols over the entire zone twice per week. The costs were unthinkable.

We modified the picket-line concept by increasing cutter spacing to 400 miles, with aircraft patrols over the entire zone twice per week. This was based on the theory that most violators sighted by the twice-weekly flights could be boarded within 24 hours. The price tag was still prohibitive.

A much more reasonable alternative was called the "active fishing areas" approach. It called for enforcement efforts to be concentrated in those identifiable areas where fishing is commercially practicable, and historically has taken place. These active fishing areas are well documented and had been patrolled routinely in the past.

Quantification of fisheries enforcement has been the subject of two major studies. The first study, in May, 1976, actually was a culmination of the CG's earlier analytical efforts. The second study was completed in February, 1977, and was a joint NMFS and CG effort. These studies examined earlier enforcement efforts, anticipated regulations to implement the FCMA, and predicted future fisheries enforcement requirements.

Performance-level criteria were developed to give us some measure of enforcement effectiveness. The enforcement effort prior to 200-mile FCZ implementation approached 75 percent effectiveness in detecting and deterring fishing violations. The projected 1978 level of enforcement is capable of detecting and deterring 85 percent of the potential violations. By 1980 presently programmed resources are expected to achieve the optimum or program standard level--detection or deterrence of 95 percent of potential violations.

Methods of Enforcement

Enforcement methods basically involve the time-tested use of aircraft and cutter patrols, plus boardings accomplished by the cutters on patrol. These methods are not alternatives; rather, they complement one another. Aircraft patrols are the only practical means currently available for achieving large-area surveillance. On the other hand, cutter patrols provide the best means for maintaining a CG presence in the active fishing areas for extended periods. To get detailed coverage and accomplish inspections to ensure compliance with gear restrictions, catch limitations, etc., boardings from cutters are necessary.

Fixed-wing aircraft patrols are particularly well suited for large-area search and for determining the presence of foreign fishing vessels in the FCZ. In good weather they are capable of obtaining some detailed data, such as type, specific identity, and activity of the fishing vessels they detect. In most instances, their navigational capability is adequate for determination of a violation of boundary restrictions. For these reasons

CG aircraft patrols are the principal means of monitoring fishing activities in the extended zone, determining compliance with season and area restrictions, detecting illegal or new fishing operations, and providing an enforcement presence throughout the zone.

Another enforcement method is the helicopter. Helicopters working from the flight deck of a fisheries patrol cutter have the unique ability to hover near a fishing vessel, and thus gain an excellent view of the fish and gear on deck to see if there is reason to send a boarding party out to gather evidence before it is destroyed. Helicopters, because they can surprise a violator in the act, also provide a strong deterrent to potential violators.

Cutter patrols provide an all-weather capability for conducting small-area search and for determining the type and indentity of a particular fishing vessel and the type of gear in use. They have the advantage of being able to remain on the scene for prolonged periods of time, thus providing a highly visible presence in the FCZ with the ability to make precise position determinations. Cutter presence is essential for the timely and direct apprehension of violators, and it provides a platform from which the necessary boardings can be made.

Boardings provide the only practical means by which certain provisions of the FCMA's regulatory regime can be enforced: prohibition of illegal retention of certain species, restrictions on incidental catch (sea life that is taken aboard along with the species being fished), restrictions on the type of fishing gear that may be used, and regulations concerning the recording and reporting of data.

Boardings also are primary means of collecting catch and effort data and monitoring vessel technology and efficiency. Only by conducting boardings can these functions be accomplished on the majority of fishing vessels, and particularly on long-liners and small trawlers, which are too small to carry an observer. In short, we depend on the boarding team to obtain the bulk of the hard data required for analysis of compliance with the new management plans.

Resources

United States CG resources include about 38,000 military and 6,000 civilian personnel and an inventory of 40 large law enforcement cutters, about 2,000 small

vessels, and 170 aircraft. These vessels and aircraft perform search-and-rescue and other CG missions, in addition to fisheries enforcement.

To implement the active fishing areas approach, the CG reactivated the high-endurance cutter UNIMAK, four former Air Force C-131s, and five HH-52 helicopters. In the area of new procurements, four new Lockheed HC-130 aircraft are scheduled for delivery during the next two months, and ten new short-range recovery helicopters will be delivered in 1980. These additional resources are deemed adequate as of now. However, adequacy is particularly sensitive to the actions of the Regional Fishery Management Councils (RFMCs).

After a year's experience with enforcement of the FCMA, and based on any changes in the regulations to be enforced, the CG will reevaluate its resource requirements. In the meantime the CG is getting on with the job of fisheries enforcement.

Implementation

Day one of CG FCMA enforcement was March 1, 1977. A total of 19 cutters and 17 aircraft were on patrol that day to implement the 200-mile FCZ. This patrol effort amply demonstrated the intent of the US to impose strict enforcement of the new law.

As of March 15, 80 foreign fishing vessels had been boarded and inspected under the new legislation, resulting in the initiation of civil penalty actions in three cases. Minor infractions discovered during these initial boardings were handled by issuance of 20 citations and 5 verbal warnings. Coast Guard boarding officers noted that the foreign fishermen had been cooperative and were attempting to observe the new regulations. The language barrier and the lack of understanding by some foreign crews of the many complex provisions of the regulations prompted boarding parties to distribute copies of the foreign fishing regulations, together with detailed explanations of their interpretation and application.

During that first month, 69 percent of all foreign fishing vessels present in the FCZ were boarded. This effort by the CG to establish credibility is evidenced in that the average boarding rate for the next five months was only 43 percent. Boarding intensity in the New England/Mid-Atlantic Region was even greater, with the boarding rate being 140 percent during March and the average being 99 percent for the next five months.

The CG's purpose in maximizing patrol presence and foreign fishing vessel boardings was accomplished. The credibility of the US intent and capability to enforce the new 200-mile FCZ was established.

The First Six Months

Results of the first six months--March 1 to August 31, 1977--of the FCMA's enforcement are impressive. As planned, CG cutter and aircraft patrol efforts were focused in the active fishing areas. A total of 1,340 foreign and domestic fishing vessel boardings were conducted. This enabled us to identify catch species, verify fishing permits, check for compliance with fishing gear restrictions, and detect violations. These efforts resulted in the issuance of 338 citations, which are written warnings, and 165 civil penalty violation reports. Citations are issued for minor or technical violations, while civil penalty actions are initiated for more serious violations which have an adverse impact on fisheries resources. The latter are administrative procedures which can result in fines of up to $25,000 per violation for each day of violation.

During this same period, 14 foreign fishing vessels were detained for suspected criminal violations. Of these detentions two resulted in seizure of the violating vessels, with subsequent fines of $250,000 and $4,900. A third foreign vessel was required to forfeit 16 tons of illegally taken fish, in addition to having civil penalty action initiated against it. The remaining 11 vessels had civil penalty actions initiated against them. A third foreign fishing vessel was seized on September 1, 1977, one day after the first six months of FCMA enforcement.

Effectiveness

The enforcement statistics to date are impressive and attest to the vigorous enforcement effort being expended. However, the important question is: "Are we making progress in achieving the conservation objectives of the Act?" The answer is a resounding "Yes."

During the first two months of FCMA enforcement, violations were detected on 50 percent of the foreign vessels boarded. This percentage decreased to 13 percent during July and August, 1977. Most revealing is the significant reduction in foreign fishing vessel activity. Compared to the same period in 1976, the average number

of foreign fishing vessels present each month decreased 35 percent--from an average of 715 per month in 1976 to an average of 471 present during the same six months in 1977. These statistics and our observations to date permit us to draw certain conclusions.

Conclusions

The active fishing area concept has proven valid. Foreign fishing activity continues to be concentrated in those areas which historically have provided fish in sufficient quantities to permit commercial exploitation. Occasional CG patrols outside the active fishing areas have detected the development of no new fisheries. Traditional fishing patterns generally are unchanged, with the exception that foreign fishing vessels are fewer in number.

The credibility of US intent and capability to enforce the FCMA has been established. This is evidenced in the 37 percent reduction in the number of violations detected on a per boarding basis and the 35 percent reduction in the number of foreign fishing vessels present.

Analysts estimate that the CG has been effective in detecting or deterring 75 percent of those violations which would have been committed in the absence of an enforcement effort. As indicated earlier, our projected enforcement efforts should permit detection or deterrence of 85 percent of the potential violations in 1978. Detection or deterrence of 95 percent of all potential violations should be possible by 1980. However, the detection- and deterrence-effectiveness estimates for 1978 and 1980 are based on the regulations being enforced in 1977. Changes in the regulations to be enforced will cause corresponding changes in the detection and deterrence estimates.

Similarly, resource requirements to achieve a given level of enforcement effectiveness are dependent on the regulations to be enforced. For this reason we will be following closely the deliberations of the RFMCs. For example, the development of management plans pertaining to the by-catch of vessels fishing for highly migratory species (tuna) could have a profound impact on CG resource requirements due to the large ocean areas involved.

Overall, the attitude of foreign fishermen toward the new regulations has been excellent. Coast Guard patrol units report that, for the most part, foreign

crews are trying to comply with the regulations and cooperate with enforcement forces. The majority of violations encountered has been of a minor nature, and most were apparently unintentional.

The Future

Looking ahead, projections are that foreign fishing efforts will continue to decline on a gradual basis, and the US fishing industry will grow. As the fishery management plans of the RFMCs are approved and adopted, NMFS will issue more regulations that are applicable to domestic fishermen. A shift in enforcement emphasis from foreign to domestic fishermen will occur. The scope and specific regulations of domestic fishery management plans could have a significant impact on CG fishery enforcement resource requirements.

Research and development efforts have been initiated with a view toward reducing CG surveillance resource requirements. Our near-term effort is concentrating on two different transponder devices. One is the retro-directive array, a radar reflector device which can add a coded identifier to the return signal. The other is a fishing vessel transmit terminal which would broadcast an identification signal to an orbiting satellite for position determination and then relay the position and identification information to an operations center ashore. The retro-directive array would facilitate on-scene or close-in detection and identification of fishing vessels by cutters and aircraft on patrol, while the transmit terminal would provide a wide-area detection and identification capability. The two devices are viewed as complementary elements in the near-term problem solution. With adequate funding, development of these devices could be completed as early as 1979.

However, nothing now available or on the horizon can take the place of the "cop on the beat"--the on-scene aircraft, cutters, and trained boarding personnel. We look to technology to provide supplemental tools that will enhance the effectiveness and efficiency of traditional enforcement methods. To that end the CG's long-range research and development plan involves development of a computer model for evaluating alternative law enforcement surveillance systems. The plan for fiscal year 1980 calls for identification and initial evaluation of candidate spatial, aerial, surface, and subsurface sensors for surveillance and law enforcement application.

The CG's perspective is one of operational law enforcement to ensure compliance with the FCMA. Recogniz-

ing that this is only one aspect of a larger effort, we will continue close cooperation and information exchanges with the RFMCs, NMFS, other government agencies, and the US fishing industry. As we work together, we must keep our objectives of conservation and management in focus. If we do, to paraphrase Thomas Jefferson, our joint efforts to date are but prologue.

Panel Presentation: Planning for Fishery Management

Session Chairman: Brian J. Rothschild

FISHERY MANAGEMENT PLANS[1]

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The administration of the Fishery Conservation and Management Act (FCMA) of 1976 involves a large number of activities, activities that range from short-term to long-term, from those which are one-time and start-up in nature to those which are repetitive and routine, and from tactical to strategic. The present analysis concentrates on a single facet of these activities--the perceived objective of the Fishery Conservation and Management Act: the harvest of an optimum yield (OY) for each fishery. This concentration minimizes the discussion of the many intermediate activities, such as the establishment of Regional Fishery Management Councils (RFMCs) and the negotiation of Governing International Fisheries Agreements (GIFAs). The concentration is not meant to suggest that these initial and intermediate activities are unimportant; rather, that they are transitory and are subservient to the primary goal of the Fishery Conservation and Management Act, which is to assure the harvest of an optimum yield for each fishery as specified in fishery management plans. Accordingly, the analysis in this paper considers the purposes of the Fishery Conservation and Management Act. It shows that those purposes can be achieved and distilled into fishery management plans which specify a level of optimum yield and which are consonant with the National Standards for Fishery Conservation and Management specified in the Act.

Next, optimum yield--the central theme of the management plan--is discussed, and it is determined that, while there is no "magic formula" for optimum yield, a thorough analysis of the components of supply, demand, and price of fish is an essential prerequisite to determining optimality. After considering the components of optimum yield, the paper considers the scenario for its

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[1]The views expressed in this paper are the author's and are not necessarily those of the National Oceanic and Atmospheric Administration/National Marine Fisheries Service.

attainment in terms of various aspects of the fishery management plans and administrative activities, and concludes that the fundamental administrative task consists of providing the appropriate administrative and intellectual support to the Regional Fishery Management Councils so that the Councils can provide, with due urgency, specifications of optimum yield in fishery management plans that are consonant with the National Standards specified in the Fishery Conservation and Management Act.

I would like to thank Fred Brooks for assistance in the preparation of this paper and James Kirkley for discussing with me some of the economic considerations.

Purposes of the FCMA

The purposes of the Fishery Conservation and Management Act (FCMA) are plainly stated:

> (1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States, and the anadromous species and Continental Shelf fishery resources of the United States, by establishing (A) a Fishery Conservation Zone within which the United States will assume exclusive fishery management authority over all fish, except highly migratory species, and (B) exclusive fishery management authority beyond such zone over such anadromous species and Continental Shelf fishery resources;
>
> (2) to support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species, and to encourage the negotiation and implementation of additional such agreements as necessary;
>
> (3) to promote domestic commercial and recreational fishing under sound conservation and management principles;
>
> (4) to provide for the preparation and implementation, in accordance with National Standards, of fishery management plans which will achieve and maintain, on a continuing basis, the optimum yield from each fishery;
>
> (5) to establish Regional Fishery Management Councils to prepare, monitor, and revise such plans under circumstances (A) which will enable the states, the fishing industry, consumer and environmental organizations, and other interested persons to partici-

pate in, and advise on, the establishment and administration of such plans, and (B) which take into account the social and economic needs of the states; and

(6) to encourage the development of fisheries which are currently underutilized or not utilized by United States fishermen, including bottom fish off Alaska.

The stated purposes of the Fishery Conservation and Management Act can be synthesized into four components:

1. The establishment of fishery management authority,

2. The attainment of optimum yield through the conservation and management of stocks,

3. The management of highly migratory fish, and

4. The development of domestic fisheries.

The establishment of authority by the Fishery Conservation and Management Act is a significant step toward achieving conservation, management, and optimum yield for each fishery. The absence of authority in the past has been a primary cause of an unsatisfactory management environment, of poor economic returns from the fishery resources, and in some instances of overfishing. Without authority the attainment of a sound conservation and management program and optimum yield would be impossible.

This discussion will concentrate, as does the Fishery Conservation and Management Act, on the two components most relevant to managing fishery resources--those which deal with authority and with optimum yield through conservation and management.

The Fishery Conservation and Management Act defines the target of fishery management--optimum yield--as follows:

> The term "optimum," with respect to the yield from a fishery, means the amount of fish--
>
> (A) which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational opportunities; and
>
> (B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor.

It is clear from the foregoing that optimum yield needs to be obtained through sound "conservation and management" principles.

The Fishery Conservation and Management Act defines conservation and management (the process through which optimum yield would be attained) as follows:

> The term "conservation and management" refers to all of the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment; and (B) which are designed to assure that--
>
> (i) a supply of food and other products may be taken, and that recreational benefit may be obtained, on a continuing basis;
>
> (ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and
>
> (iii) there will be a multiplicity of options available with respect to future uses of these resources.

In other words, each fishery needs to be managed to attain a yield which is beneficial to the nation regarding both food and recreation, and which is a modification of maximum sustainable yield (MSY) where the modification is based on economic, social, or ecological factors. The management procedures, which will in effect be procedures leading to optimum yield, will need to take into account those conservation and management principles and decision elements (i.e., rules, regulations, conditions, and methods) that lead to a perpetual maintenance of the maximum social value of the fishery resources to all concerned.

The purposes of the Fishery Conservation and Management Act also make it clear that optimum yield is to be specified for each fishery through the medium of the fishery management plan (FMP). While the substance of the Act places on the Secretary of Commerce the responsibility for the final approval of fishery management plans and for the promulgation and enforcement of regulations, it is intended that the Regional Fishery Management Councils will be the principal instrumentalities for fishery management plan development. Thus a fundamental purpose of the Fishery Conservation and Management Act is to attain optimum yield for each stock as specified in fishery management plans prepared by the Regional Fishery Management Councils.

The achievement of OY thus appears to be the raison d'être for the FCMA. However, it will be readily agreed that OY is to many an ambiguous concept, and that a working definition of its meaning needs to be developed before optimality can be operationally attained.

Optimum Yield

At the outset it is well to recognize that an optimization process usually involves (1) the distribution of scarce resources among people or activities such that either the benefits are maximized or the losses are minimized, (2) people or activities that will use the scarce resources, and (3) a set of rules by which the scarce resources will be distributed among the people and the activities. The objective of the optimization process is to maximize, in some sense, the benefits derived from the distribution process.

In the context of the FCMA, the scarce resources are the fish. The people or activities are the producers (e.g., foreign neighbor fishermen, foreign distant-water fishermen, US recreational fishermen, US commercial fishermen), processors, and consumers of the resources. The set of rules which pertains to the way the fish are distributed among the producers, the processors, and the consumers relates to the way in which the fish flow among those groups. An example of the flow of fish is shown in Figure 1. The figure consists of three "bars." These reflect the level of the stock in US waters, the quantity of fish caught from the US stock, and the total supply to US processors and consumers.

We can see that fishing mortality operated on the level of stock to yield the quantity caught. This quantity then moves into the US supply. The US supply of fish from US waters is generally less than that caught in US waters because some of the US commercial catch is exported, and not all of the fish caught by foreign fishermen in US waters are imported into the US. The US-caught supply is supplemented by fish imports and fish substitutes. The substitutes may be commodities, such as poultry which consumers would replace in their market baskets for fish depending on, say, the relative prices of each. In addition it is important to note that fish caught by recreational fishermen contribute to the US supply of fish, but do not necesarily enter the US market.

Each group of individuals perceives as a part of the optimization procedure a different flow of fish. Furthermore, this flow of fish is perceived not only in terms of

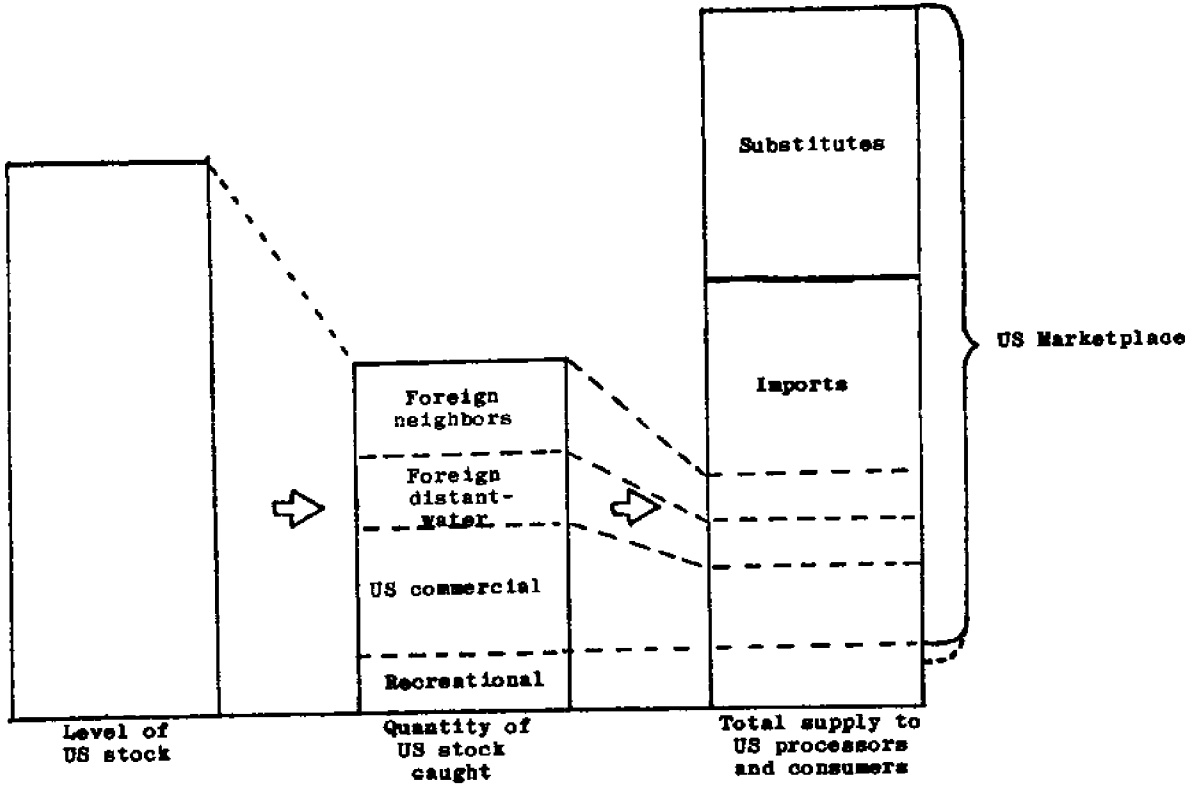

Figure 1. The flow of fish

the quantity of fish, but also in terms of the price that must be paid to obtain a given quantity of fish. We assume that the quantities supplied at particular prices are generated according to economic theory. The machinery by which these laws might work, even in a highly aggregated view of fish as a commodity, is quite complex. The economic variables and their interrelations are shown in a greatly simplified diagram in Figure 2.

The figure shows that the producer (the fisherman) perceives certain costs and revenues. The costs are in terms of the capital and labor required to harvest the fish, and the returns are the value of the harvest, which is of course related to the density of the fish on the grounds. Given this information, the producer generates a supply curve to depict the quantity of fish he is willing to supply for a particular price. At the same time the processor determines, on the basis of information on his own capital and labor and his analysis of the consumer, how much he is willing to pay for a particular quantity of fish. The producer supply and the processor demand thus interact in the marketplace to set the quantity and price of fish at the ex-vessel (on the dock) level. The processors, wholesalers, and retailers then add value to the ex-vessel fish through processing and through the development of wholesale and retail margins. These generate the processor-wholesaler-retailer supply curve. The interaction of this supply curve with the consumer demand then generates the quantity and price of fish on the retail market.

We can see how the manipulation of selected components (supplies, demands, prices) of this model can contribute to the achievement of optimality. However, it is important first to point out some examples relative to the complexity of the system. These relate to problems of measurement and of the interaction of components.

An important problem of measurement relates to the fact that determinations of desirable allocations of fish are generally made on the basis of the quantity caught, and not on the density of fish on the grounds. This approach, however, is not logical. To demonstrate this, note that a stock that is lightly fished will have a higher density on the fishing grounds than a similar stock that is heavily fished. Suppose it is determined that a stock can yield 100,000 tons of fish on a sustained basis, suppose US fishermen have a capacity to catch only 20,000 tons, and suppose that there is no foreign fishing on the stock. The US fishermen then will catch 20,000 tons at a relatively high catch-per-unit-of-effort (a crude index of profitability). Now,

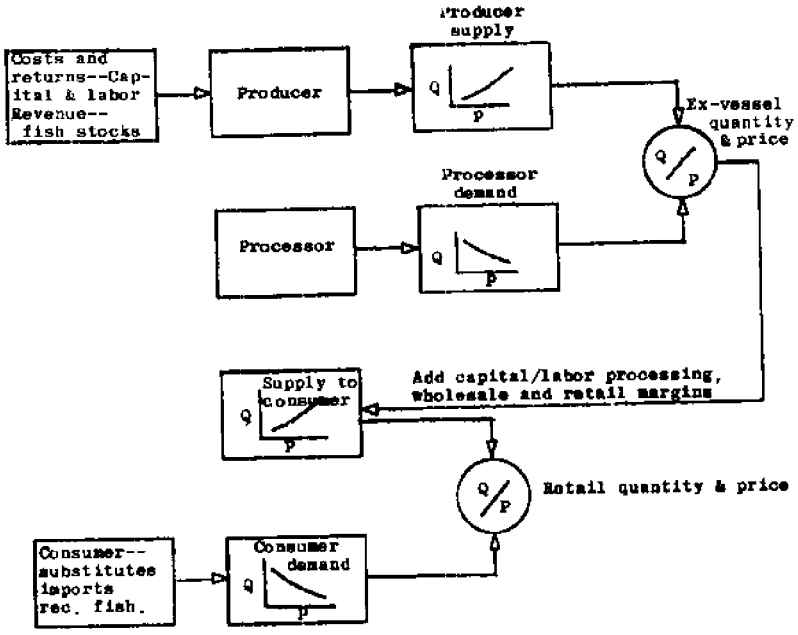

Figure 2. Quantity and price relationships--an optimality model for fisheries showing how producer supply and processor demand set the market clearing ex-vessel quantity and price, and how supply to the consumer demand set the market clearing retail quantity and price. It is clear that as we manipulate the endogenous variables in this model, such as producer supply, or exogenous variables, such as the effect of recreational fishing on consumer demand, prices and supply change. Since these can, as the result of the manipulations, go up or down, there are different "winners and losers" and the amounts won and lost change. Specification of the winners, the losers, and the amounts won and lost, is a necessary first step to determining optimality.

suppose 80,000 tons of the same stock are allocated to foreign fishermen. The US fishermen continue to catch their 20,000 tons, but at a greatly reduced catch-per-unit-of-effort. In other words, the presence of the foreign fishermen makes it much less profitable to catch the same quantity of fish. In this particular example, all other things being equal, the "optimum" amount of foreign fishing would be zero.

Another example of a measurement problem involves the recreational fishing industry--an important target of conservation and management in the FCMA. The problem is that, while recreational fishermen are certainly desirous of catching fish, they also are desirous of enjoying the process of catching fish. Recreational fishermen place a value upon the "quality of experience" associated with recreational fishing.

The relationship between the supply of and demand for recreational fishing is shown in Figure 3, which is intended to show that the value placed on recreational fishing and the value placed on commercial fishing require different assessment criteria because motivations in recreational fishing are quite different from those in commercial fishing. These of course must be included in an optimality calculus.

A supply-demand analysis of recreational fishing based on the sketch in Figure 3 would be rather complex, and might even be criticized because of the lack of a clearly defined, orthodox marketplace for recreational fishing. Nevertheless, it is instructive to examine the configuration of supply and demand in recreational fishing as a proxy to evaluating recreational fishing, per se, because these functions are such an important part of the optimality configuration.

The development of this model involves asserting that society is willing to supply to recreational fishermen a predictable balance of quantity of fish and quality of fishing experience at a particular price. On the other hand, recreational fishermen are going to demand various combinations of fish and satisfaction at a particular price. (Would you prefer to catch a few fish on an attractive lake where there are few other boats, or would you rather catch more fish on a crowded, well-stocked lake?)

While it is easy to measure the quantity of fish, the measurement of satisfaction is more difficult--but not impossible. For example an interview procedure could be developed that would quantify qualitative

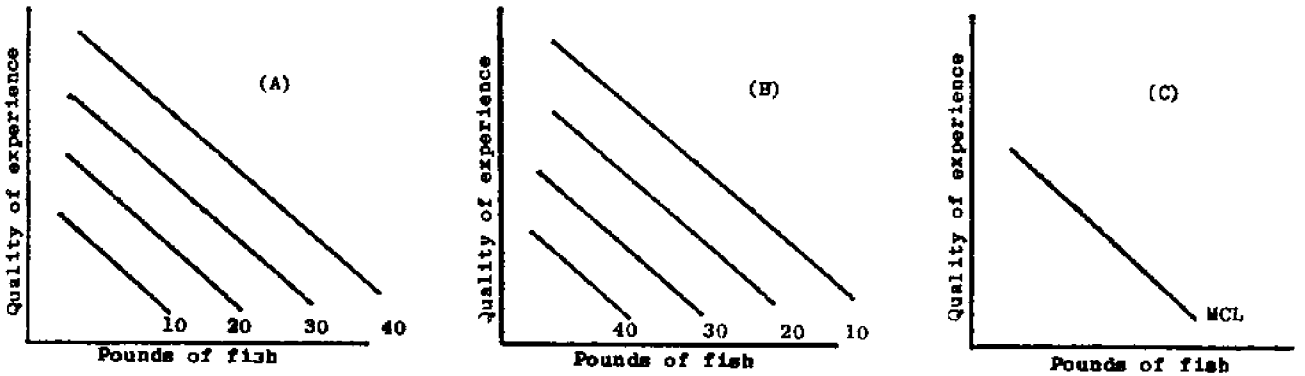

Figure 3. Supply and demand relations between pounds of fish and quality of experience in a recreational fishery. Panel A shows the contours for the supply surface; panel B shows the contours for the demand surface; and panel C, the market clearing line which is described by the intersection of the supply and demand surfaces. The contoured response to any particular combination of pounds of fish and quality of experience is of course price. It is interesting to note that the "rotation" of the surface expresses the suppliers' (society's) or the demanders' (the recreational fishermen's) willingness to trade off a quantity of the catch with a quality of experience.

responses of fishermen regarding their level of satisfaction.

The interesting feature of the three-dimensional surfaces in Figure 3 is that they can be manipulated to determine the effect of these surfaces on, for example, the economics of producing fishing tackle, as well as on the density of fish on the grounds.

In addition to problems of measurement, the complex interactions in the simple commodity model of Figure 2 are readily evident. In fact even a simplistic list of components in the flow of fish, assuming a single species, reflects that there are perhaps 10 interacting components (e.g., level of stock, foreign neighbors, importers, etc.), and these would make up 100 first-order interactions (e.g., level of stock, foreign neighbors; level of stock, importers; etc.) that would need to be considered as possible contributors to the measurement of optimality.

The nature of the complex interactions can be seen in the following examples: (1) each producer affects the fishing density, and hence the profitability of other producers; (2) changes in profitability imply changes in the supply curve; (3) the quantity of fish entering the retail market is less than that which is consumed owing to recreational fishing; and (4) substitutes and imports can dominate the retail demand system.

Thus we can see that a multistep commodity model does much to predict, in economic terms, effects on the various participants in the fishery, and hence their view of optimality. By modifying components of the model we should be able to determine the effect of certain policy decisions (such as quotas, size restrictions, tariff decisions, etc.) upon the individual participating in the fishery in terms of quantity of fish available to the individual and the price the individual will have to pay for the fish.

There are, in addition to the economic considerations, certain social considerations. These include questions of family and community development and the actual welfare of the fishermen. These can be expressed, in a number of instances, as functions of the economic variables. In some cases they cannot, and techniques of qualitative analysis must be developed and applied.

We have developed a rudimentary model of how fish flow as a commodity through the US socioeconomic system. By demonstrating some of the difficulties in measurement

(e.g., recreational fishery perceptions and density vs. catch), as well as the complex interactions of the participants in the system, we can see that certain management decisions may give results contrary to the intuition. For example (1) maximizing the economic return to the fishermen, or (2) maximizing the supply of fish to the consumer, or (3) maximizing recreational opportunities, or (4) minimizing the price of fish to the consumer might, if undertaken, produce serious negative repercussions on the entire system, and might even be ineffective in achieving the stated purpose of the strategy.

We can see from the complex interactions of this model that optimization of yield will not be a simple maximization or minimization problem. There will have to be an application of value judgments to the relative needs of the participants. At the same time it is absolutely essential to recognize that the complexity of the interactions warrants the use of a model, such as that depicted in Figure 2, so that the decision-makers can evaluate the potential consequences of their decision processes.

A point of considerable and basic importance, however, is that while the concept of OY has caused some bemusement, there is in economic theory a societally optimal catch. This derives from basic supply and demand theory. Figure 4 shows the relation between supply, demand, and marginal curves. The point at which these curves intersect is called the market clearing point. It is a societally optimal point because it represents the maximum production at the highest price to the producer and the maximum production at the lowest cost to the consumer. It is interesting to note that OY implies an optimum amount of fishing effort and vice versa. This is important because it provides an opportunity to define OY as the catch which is taken with optimal effort. Of further interest is the fact that the societally optimal point can generate catches greater than those which would obtain if the producing segment of the industry were maximizing profit. This is also shown in Figure 4, where we have drawn the marginal revenue line to show that its intersection with the marginal cost line (i.e., the profit maximization point) is different from the societally optimal point. This implies that the conventional limited entry advice--seeking to maximize profit--is not in general, by definition, societally optimal.

Finally, there is no universal formula for optimality. Its determination will have to be undertaken by those who prepare the management plans, and their perception of optimality will be tested against the

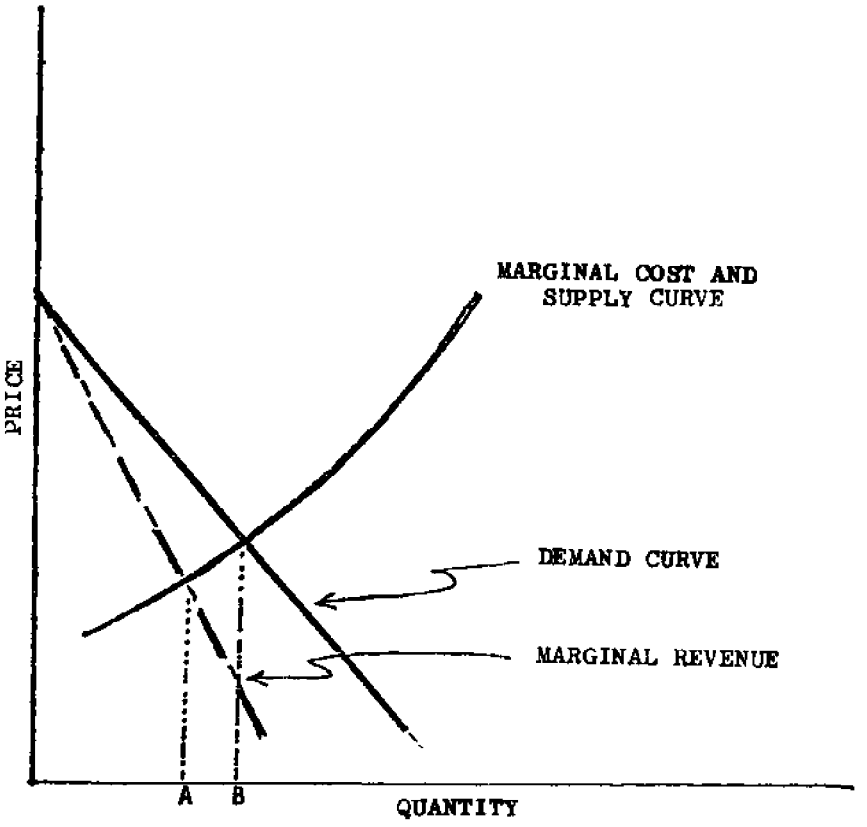

Figure 4. Relation between supply, demand, and marginal revenue curves showing the societally optimal point (the intersection of the supply and demand curve) and the profit maximizing point (the intersection of the supply and marginal revenue curve). The figure shows that B, the quantity caught under societally optimal conditions, is greater than A, the quantity caught under profit-maximizing conditions. Thus, the fishery at the societally optimal point may require an expenditure of effort which is greater than that which is recommended in conventional limited-entry advice.

National Standards and other specifications of the Fishery Conservation and Management Act.

Perhaps one of the best tests of optimality involves the National Standard which requires that the plan be based upon the best scientific information available. If the plan depends upon optimality, and if optimality is based upon the best scientific information, then would it not be logical that the plan include a model for evaluating the economic, social, and ecological interactions that would develop as a result of any proposed management action?

Clearly, optimality is a central and dominant goal of fishery management, management plans may differ in the manner in which optimality is interpreted, techniques for evaluating optimality are available, and optimality can indeed be addressed. Given these observations, it becomes evident that the administration of the FCMA has as its fundamental goal the attainment of OY for each fishery. Administrators of the FCMA must therefore address the question, "How can OY for each fishery be attained?"

Fishery Management Plans

The FCMA prescribes five required provisions and seven discretionary provisions for fishery management plans, as quoted here:

> REQUIRED PROVISIONS.--Any fishery management plan which is prepared by a Council, or by the Secretary, with respect to any fishery, shall--
>
> (1) contain the conservation and management measures applicable to foreign fishing and fishing by vessels of the United States, which are--
>
> (A) necessary and appropriate for the conservation and management of the fishery;
>
> (B) described in this subsection or subsection (b), or both; and
>
> (C) consistent with the national standards, the other provisions of this Act, and any other applicable law;
>
> (2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interests in the fishery, and the

nature and extent of foreign fishing and Indian treaty fishing rights, if any;

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

(4) assess and specify--

(A) the capacity and the extent to which fishing vessels of the United States, on an anual basis, will harvest the optimum yield specified under paragraph (3), and

(B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and

(5) specify the pertinent data which shall be submitted to the Secretary with respect to the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged, time of fishing, and number of hauls.

DISCRETIONARY PROVISIONS.--Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may--

(1) require a permit to be obtained from, and fees to be paid to, the Secretary with respect to any fishing vessel of the United States fishing, or wishing to fish, in the fishery conservation zone, or for anadromous species or Continental Shelf fishery resources beyond such zone;

(2) designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

(3) establish specified limitations on the catch of fish (based on area, species, size, number, weight, sex, incidental catch, total biomass, or other factors), which are necessary and appropriate for the conservation and management of the fishery;

(4) prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement of the provisions of this Act;

(5) incorporate (consistent with the national standards, the other provisions of this Act, any

other applicable law) the relevant fishery conservation and management measures of the coastal states nearest the fishery;

(6) establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account--

(A) present participation in the fishery,

(B) historical fishing practices in, and dependence on, the fishery,

(C) the economics of the fishery,

(D) the capability of fishing vessels used in the fishery to engage in other fisheries,

(E) the cultural and social framework relevant to the fishery, and

(F) any other relevant considerations; and

(7) prescribe such other measures, requirements, or conditions and restrictions as are determined to be necessary and appropriate for the conservation and management of the fishery.

In addition to the required and discretionary provisions, seven National Standards for fishery conservation and management are established by the new legislation. All fishery management plans prepared under the new law are to be consistent with the National Standards. They are quoted here from the FCMA.

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.

(2) Conservation and management measures shall be based upon the best scientific information available.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

(4) Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such

measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Since MSY figures so strongly in the interpretation of OY, it merits further discussion. Maximum sustainable yield has been shrouded in controversy. The basis of this controversy is not the relatively simple definition of MSY (the maximum yield which is equivalent to the instantaneous increase in the population from growth and recruitment), but rather the flaws in the utility of the simplistic MSY model. These flaws are of course well recognized, and can be classified as relating either to the mathematical theory of MSY and how it is estimated, or to problems associated with MSY as a criterion for fishery management.

With respect to the mathematical theory, we can list some of the characteristics of the MSY format and some of the properties of fish populations that deviate from the MSY format.

1. The MSY calculations require an instantaneous response of the population to changes in recruitment, growth, natural mortality, or fishing. Deviation: Most fish populations cannot respond instantaneously to changes in parameter values.

2. The calculations are age-independent. Deviation: Shifts in age structure modify the interpretation of MSY.

3. The calculation of MSY is based upon populations that are in equilibrium. Deviation: Large year-classes typical of most fish populations distort both the model and attempts to estimate its parameters. Most data are from populations that are not in equilibrium.

4. The MSY curve is represented traditionally as a parabola. Deviation: The "traditional" parabolic form of the MSY curve might not be the "best" form. The shape of the yield curve is not generally known.

5. The MSY calculations are based on only a single species. Deviation: A single-species ecosystem is an abstraction.

6. Maximum sustainable yield calculations are dependent on good calculations of fishery mortality. Deviation: In some fisheries mortality is very difficult to compile.

It is particularly pertinent to the discussion in this paper to note that MSY for a particular stock is not necessarily unique. If, for example, we change the minimum size at which fish are caught (i.e., the size limit), then we also change MSY for the stock. Which MSY do we use when we want to determine optimality?

With respect to the problems associated with using MSY as a criterion for fishery management, MSY does not give insights into allocative, economic, or social kinds of decisions, and since these are critical to the fishery management process, MSY falls short in providing a complete decision criterion. This, of course, is recognized in the concept of OY as defined in the FCMA.

Thus, the concept of MSY--a mandatory component in computing OY as prescribed by the FCMA--is fraught with difficulties. These difficulties are serious, however, only when the mathematical shortcomings (problems of the first class) are not thoroughly addressed in the analysis, or when more is attributed to MSY than that which is included in the theory (problems of the second class). Given these problems with MSY, one may wonder if it makes sense to pass through MSY calculations in the first place to achieve optimality, as presently required by the law.

It would seem, then, that required provision number 3, which calls for the assessment and specification of OY, would be satisfied by (1) a statement of MSY, (2) a discussion of the caveats associated with MSY analysis, (3) an analysis of how the various provisions of the management plan affect the costs and returns in fishing as well as the supply and price of fish to the various relevant producers (including recreational fishing), and (4) conclusions on the OY based on all of these (viz, the MSY as modified by the relevant social, economic, and ecological considerations). While the technical analyses, which should be undertaken in a systematic manner at an appropriate level of detail, may be conducted by various groups, the decisions implicit and explicit in their OY conclusions will need to be undertaken by the RFMCs. The RFMCs will make the optimality determination based on their own judgment, with heavy emphasis on consideration of public input.

Optimality cannot at present be uniquely defined. There are many options, depending on one's economic and

social perspectives. Maximization or minimization will cause some individuals to win and some to lose. While we often can identify what is economically desirable, we sometimes fail to recognize that these economic desiderata can cause significant social problems. The RFMCs are therefore in the best position to make determinations of optimality. These determinations will be different for each council and for each fishery management plan, in that they will fit the local conditions. Yet, in another sense, they will be similar in that they will all reflect locally desired criteria, and will at the same time be consonant with the National Standards.

The next required provision in the management plan is an assessment and specification of the capacity of US fishing vessels to harvest the OY, and the extent to which they will harvest the OY. The components of the assessment and specification of capacity are not revealed in the FCMA. It can be argued that the assessment and specification would be meaningless without thorough consideration of the degree to which the constraints that are permitted in the discretionary provision are invoked. For example a statement about US capacity to harvest OY might or might not consider the impact on that capacity of requiring that fees be paid, or of designating zones where only certain kinds of vessels or gear may be used, or similar constraints. It is quite possible for capacity to be stated, as required, without imposing any constraints, since the latter are all discretionary.

The next required provision in the fishery management plan is a specification of data necessary for management. It is of some interest that the required data are essentially noneconomic. The data are specified as dealing with the catch by species in numbers or weight, the type and amount of gear used, the place and time of fishing, and the number of hauls. It is therefore at the discretion of the RFMCs to determine whether or not any other data need to be reported. It is also conceivable that an RFMC could restrict its consideration of optimality to biological factors only, on the grounds that there are no relevant economic, social, or ecological factors beyond MSY, and that MSY will provide the greatest overall benefit to the nation. In such a case, it would have to be demonstrated that such a finding is consistent with the National Standards.

At this point it is appropriate to examine the required provisions regarding the way they would interface with the National Standards, because it is conceivable that plans could be prepared, based only on required provisions, and not include any of the discretionary provi-

sions. In other words, if we have a plan based only upon required provisions, how would this plan meet the test of being consonant with the National Standards? A plan based on only required provisions would be a plan in which measures would be limited to (1) a description of the fishery, (2) MSY and OY, (3) physical capacity of and probable harvest by US vessels, and (4) the obtaining of only those data listed in required provision number 5.

The foregoing suggests an inconsistency in the required provisions, since OY requires consideration of relevant economic, social, and ecological factors--but the consideration of most of these comes under the discretionary provisions of the FCMA. In other words, to fulfill that which is required under optimality, some of the factors that are discretionary need to be addressed in the plan. It is of further interest, along the same lines of reasoning, that the conservation and management measure of yield-per-recruit (which involves setting a minimum-size limitation and a level of fishing mortality that maximizes yield-per-recruit) does not have to be considered (owing to size limitations being discretionary); yet, anyone managing a fishery would consider this an important measure. Also, the minimum size might be an important determinant of the nature of MSY and, by extension, OY. The cornerstone of the conservation part of conservation and management is the question of maintaining recruitment at some satisfactory level, and this is not explicitly considered as either a required or a discretionary provision.

Thus it is only required to propose MSY and OY and the capacity of the vessels along with certain limited data requirements. What is new and different, of course, is OY. But it is clear that the RFMCs have at present a wide degree of latitude in its interpretation.

On the other hand, the Secretary of Commerce, by virtue of the National Standards, also can interpret OY. This delicate balance in the determination of optimality must of course be weighted by standard 5. Continuing this reasoning, it may be that the National Standards require more from a plan than is specified in the required provisions.

Examples of potential internal conflict in plans based only on required provisions are as follows:

1. The required provisions do not require a statement of yield-per-recruit. Furthermore, information required for yield-per-recruit analysis is in the discre-

tionary provisions, emphasizing the fact that it is not required. Yet, it would be difficult to say that a plan without a yield-per-recruit analysis conforms to standard 2 and is "based upon the best scientific information available."

2. The only economic treatment in the required provisions is that which is implicit in OY. But again, because some of the approaches to optimality are clearly discretionary, it may be difficult to attain OY as it is defined in the FCMA. Furthermore, because of this there is a question as to whether or not a plan based only on required provisions can be compatible with the National Standard, "measures shall . . . promote efficiency in utilization." There is a further question as to whether or not this phrase is compatible with the advice that "no such measure shall have economic allocation as its sole purpose."

Finally, the discretionary provisions allow RFMCs to recommend the issuance of permits and charging of fees, designation of zones and/or times when fishing may be restricted, establishment of catch limits, control of gear and equipment, consideration of state conservation and management measures, establishment of a limited access system, and inclusion of other necessary conservation and management suggestions. Stated simply, the required provisions merely enable a systematic examination of the dynamics of the stocks. The degree to which economic and social management are entered into is really dependent upon the RFMCs. The RFMCs do have considerable latitude to consider the whole optimality spectrum by virtue of the discretionary provisions. The Secretary of Commerce, however, has the overall responsibility for optimal management by virtue of the FCMA and the National Standards, and can, in fact, undertake plan preparation if an RFMC does not prepare a needed plan within a reasonable time.

In addition to the National Standards and the required and discretionary provisions for FMPs prescribed by the FCMA, guidelines have been issued by the Council on Environmental Quality (CEQ) for the assessment of any major federal action that may significantly affect the quality of the human environment. These guidelines require analyses in the following areas: (1) relationships of the proposed action to outer continental shelf, marine and state coastal zone use plans, policies, and controls for the area; (2) probable impact of the proposed action on the environment; (3) alternatives to the proposed plan; (4) probable adverse effects of the action that cannot be avoided; (5) relationship between local, short-term use of man's environment and the maintenance and en-

hancement of long-term productivity; (6) irreversible and irretrievable commitments of resources involved in the proposed action, should it be implemented; and (7) other interests or considerations of federal policy offsetting adverse environmental impacts of the proposed action.

In addition to the requirement in these guidelines to address the environmental consequences of actions recommended in FMPs, there are other provisions. These include explicit requirements (1) to identify alternative management strategies (not explicitly required in either the National Standards or the required or discretionary provisions); (2) to assess the relationships of FMPs to existing federal, state, and local plans or programs for the area (covered only in part by discretionary provision number 5; and (3) to look as broadly as possible at the total, long-range consequences of carrying out an FMP (implicit and permissive in the definition of OY, explicitly required by CEQ guidelines).

The key element in the entire administrative process is the development of a mechanism, not only to support the RFMCs (a relatively simple, tactical task), but also to interact with the RFMCs through the Secretary's responsibility to cause management plans to be developed and implemented in such a manner that optimal management of the resources is achieved in compliance with the FCMA and in accordance with the provisions of other applicable laws (a more difficult and challenging strategic task). The development of such a mechanism will involve undertaking a number of activities at the national level.

The Administrative Challenges

The administrative challenges of the FCMA are quite basic. They lie in preparing or in facilitating the preparation of FMPs for perhaps as many as 80 stocks of fish. If FMPs are to be prepared in a timely fashion, so that a total fishery management system is developed in the spirit of the FCMA, there will need to be a mobilization of a large scientific and technical support system for the RFMCs.

Fishery management cannot be undertaken without an FMP; thus, a timetable for developing FMPs will need to be developed. Should we in each instance attempt to make a "perfect plan," or is it more desirable to shorten our sights and have a less-than-perfect management blueprint at an earlier date? To answer this question analytically, we will need to assess for each fishery the costs of not managing the stocks against the benefits that would accrue from management.

To prepare an adequate plan without some notions of optimality will be difficult. While there is no magic solution to the optimality problem, the RFMCs must be able to determine the probable effect of any of their FMP components on the various participants in the fishery and on the various consumers of the fish. This is not a simple task, and I believe that a substantial modeling effort will need to be developed to assess these complexities.

The management of fish under the FCMA will involve the management of considerable quantities of data to determine the status of the stocks and the distribution of the fishery, as well as the monitoring of social, ecological, economic, and biological changes resulting from application of the management strategies. The appropriate format for collecting and processing of data, as well as its dissemination in the form of reports, is a management information system. Thus it is evident that the RFMCs have much to do in concentrating their attention on fishery management. For this reason, the efficiency of RFMC operations becomes of paramount importance. Since the RFMCs have little experience to date in working with their staffs, it is too early to speculate on their efficiency.

Particular administrative challenges arise in dealing with neighbor countries, such as Canada. Fishery arrangements with neighbor countries do not fall naturally among the required and discretionary provisions of the FCMA. This is because (1) some stocks cross boundaries, and the RFMCs therefore cannot make FMPs without acknowledging an unpredictable amount of fishery effort on the neighbor side of the boundary; and (2) some boundaries are in dispute and it is not always clear whether fishing is in US waters or in the neighbor country's waters. The challenges in dealing with foreign countries are reflected in the difficulty of rationalizing the existence of foreign fishing under the density model, discussed earlier, and the development of strategy to keep the total catch at the OY.

The FCMA explicitly avoids either the extension or diminution of the authority of the coastal states within the territorial sea--that is, from the shoreline to a point three nautical miles from shore, where approximately 60 percent of the total US commercial catch originates, and where about 90 percent of recreational fishing takes place. There is no federal authority to regulate fisheries in the territorial sea, except when an FMP is in effect in the Fishery Conservation Zone (FCZ) and some action or inaction in a state is deleterious to the implementation of the plan. If the fishing in that fish-

ery is predominately in the FCZ, the Secretary of Commerce may take action to regulate the fishery inside the territorial sea. Otherwise, state authority prevails.

The states have been exercising their sovereign authority over fishing in the territorial sea since the authority was given to them by the Submerged Lands Act of 1953. This authority rests with the state legislatures. Some of the state legislatures still retain that authority, and have not delegated it to their respective state fishery director. Since some legislatures only meet annually or less often, the speed of reaction of a given state can be quite slow relative to the needs of fishery management.

It is evident that our system of political boundaries, which divides the territorial sea into many separate, sovereign domains, is incongruous with the need to manage fishery stocks and groups of interrelated stocks as ecological units throughout their ocean ranges. This incongruity has led some to believe that the only avenue to effective fishery management is through the assumption of federal authority for the development and enforcement of FMPs for all fisheries, or at least for interstate fisheries, in the territorial sea as well as in the FCZ.

The administrative challenges in the area of managing territorial sea resources therefore center around the facts that (1) some state legislatures are reluctant to delegate management authority to their state directors; (2) interstate cooperation is voluntary, consequently there is no way to guarantee it; (3) there is no authoritative way to adjudicate differences between states; (4) there is no formal way of including interested citizens in the management decision process, as there is for fisheries in the conservation zone; and (5) there is no accepted standard against which to measure the adequacy of FMPs.

The administrative challenges of the past, which have been essential in order to bring the RFMCs into existence, have become subservient to the administrative challenges of the future. These principally involve the development of a rationale and mechanism for selective and timely preparation of FMPs; the fabrication of models to assist in coming to grips with the concept of optimality; the mobilization of people, equipment, and procedures to collect, process, and disseminate data and information; the resolution of international problems; and translation of FCMA management philosophy into an action program for dealing, as appropriate, with fisheries in the territorial sea.

ATLANTIC SEA CLAM FISHERY: A CASE HISTORY

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The surf clam (Spisula solidissima) resource of the Atlantic coast of the United States (US) and the industry it supports are in trouble. This should come as no surprise to the serious student of US fisheries. Despite its relatively recent development, and a history of domestic fishery resource failures to serve as a warning, the industry has grown without effective controls. Growing markets led to an extension of fishing from the original grounds off Long Island, New York, to the continental shelf over almost the entire geographic range of the species, from New England to Virginia. Clam stocks have been reduced on ground after ground.

Recent scarcity of the living resource in most areas has caused prices to rise; and this in turn has led to increased efficiency and harvesting effort, including substantial investments of new capital and labor. The classical history of fishery development around the world has been repeated once again, despite lessons implicit in recent world fishery development and, more specifically, the history of repeated disasters in the coastal fisheries of the US. Warnings were evident in the surf clam industry almost 20 years ago. Although they were recognized at that time, nothing effective was done. The tragedy was noted recently by Wise et al. (1976): "There is presently no management of the surf clam fishery, nor is there immediate prospect of management or regulation." There never has been, and never will be, a foreign fishery to complicate management of the surf clam industry. No significant recreational fishery exists to make the task of the domestic manager more difficult. Responsibility for failure rests with federal and state governments and industry.

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[2]Contribution 196 from the Marine Sciences Research Center

The opportunity to manage this important fishery has always existed. Passage of the Fishery Conservation and Management Act (FCMA) of 1976 neither increased nor diminished the opportunity. The only difference now is that under the provisions of the FCMA the US government has committed itself to manage purely domestic fisheries such as this, as well as fisheries shared with foreign fishermen. Are the mechanisms provided by the FCMA adequate to assure success where domestic institutions apparently were inadequate before?

The New Regime

It is not necessary to describe all provisions of the FCMA to summarize its relation to surf clam management. The FCMA includes sea clams in a list of "continental shelf fishery resources" which were reserved exclusively for the US under the provisions of the 1958 Geneva Convention on the Continental Shelf. Thus, no surplus was available to foreign fishermen, even if fishermen of the US were not taking the total allowable catch. There is no need to negotiate a governing international fishery agreement to cover foreign harvesting of surf clam or ocean quahog (Arctica islandica), nor to issue foreign fishing permits. It was not necessary for the National Marine Fisheries Service (NMFS) to prepare a preliminary fishery management plan (FMP) for sea clams, for the FCMA delegates responsibility to Regional Fishery Management Councils (RFMCs) to prepare FMPs for purely domestic species.

By agreement with the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (MAFMC) assumed the lead in preparing a sea clam plan. In this task the MAFMC had the benefit of prior work by the Surf Clam Subboard of the State-Federal Fisheries Management Board. The MAFMC plan (MAFMC, 1977) was based on a plan developed over a four-year period by the Subboard, which was composed of representatives of state and federal governments and industry. This plan, with some modifications, became the MAFMC plan (Rinaldo et al., 1977). The MAFMC has recommended to the Secretary of Commerce, among other things, annual quotas of 1.8 million bushels or 30 million pounds of surf clam meats (about 15,800 metric tons of meats), 30 million pounds of ocean quahog meats, limits on harvesting effort, and limits on new entries into the fishery. This management plan has high priority among the responsibilities of the MAFMC.

History of Domestic Fisheries

The fisheries of the Middle Atlantic Bight often have been cited as an example of the consequences of inadequate domestic fishery management. Perlmutter (1959) pointed out the rise in catches of food fishes in the region up to the 1940s and a subsequent decline, despite increasing fishing effort. He concluded that most major species were less abundant than formerly, although reasons for the decline were obscure. He noted a general lack of appreciation of the importance of these regional fishery resources and recommended an expanded, coordinated effort to obtain better information on the fish and fisheries of the area. June (1956) noted the decline of the pound net fisheries of the region, recognized that growth of the more efficient otter trawl fishery may have been a contributing cause, but concluded that existing biological knowledge was inadequate to explain the reasons for trends in landings. McHugh (1959) questioned the feasibility of management species-by-species, even if the sociopolitical climate were conducive to management for optimum yields, and suggested that more attention be given to the possibility of management of the entire biomass.

Wise et al. (1974) noted continued declines in most bivalve mollusk stocks and concluded that restrictive laws and lack of management information were contributing factors. More recently Edwards (1976) reviewed the status of major commercial finfish stocks in the region and showed that total biomass and landings had declined from the mid-1960s to mid-1970s. He concluded that current concepts of fishery management were inadequate to cope with the complexities of the marine fish ecosystem.

McHugh (1972, 1974, 1977) pointed out long-term downward trends in production of most coastal fishery resources in the New York Bight region and the general absence of effective management measures. Particularly striking was the conclusion that catches of species harvested exclusively by US fishermen had declined more sharply than catches of species or stocks shared with foreign fishermen (McHugh, 1977), which was at variance with prevailing public perceptions that the only major problem of the fisheries of the region was foreign fishing. The implication was clear that domestic management of coastal marine fisheries has been inadequate, and this was the basis for doubts that unilateral extension of jurisdiction would work. These doubts were shared by other students of US fisheries (Anderson, 1977).

Molluscan shellfish resources of the Middle Atlantic Bight region have declined even more abruptly than fin-

fish resources. McHugh et al. (1958) showed that oyster production had dropped about 50 percent in 50 years, soft clam landings had declined sharply since the 1940 peak, hard clam production had slumped since 1951, and about the only bright spot at that time was the developing surf clam fishery. In the 1940s and 1950s no research on the surf clam was conducted by federal or state agencies, and the status of the resource was unknown. Shellfish biologists concluded that existing knowledge of the surf clam was insufficient to develop a sound management program. A recent review of the US clam industry called attention to the declining resource and lack of effective controls on harvesting, and expressed the hope that the MAFMC might provide a forum for rational management (Ritchie, 1977).

In public hearings held by the NMFS and the MAFMC, as required by the FCMA, it has become clear that many fishermen have misinterpreted the intent of the FCMA. A common view has been that the FCMA proposed to eliminate foreign fishing entirely within the zone of extended jurisdiction, and that US fishermen would be free to operate as they pleased. Those who see the FCMA in that light are in for a rude awakening. Foreign fishing within 200 miles will continue as long as it is determined that domestic fishermen cannot utilize the total allowable catch. Domestic fishing must and will be regulated. These principles and obligations are laid down clearly and specifically in the FCMA.

At first glance it would appear that the surf clam problem is relatively simple. With no foreign or recreational fisheries, no regulation, and growing markets for the product, the US commercial fishing industry appears to have been destroying the resource successfully on its own, without outside help. Evolution of the fishery from modest beginnings off Long Island, New York, in the 1940s to almost the entire geographic range of the resource by the early 1970s; rapidly increasing exploitation of the ocean quahog resource; sharply rising prices for surf clam; growth of the fleet in numbers and harvesting capacity; and sharply declining landings since the peak year of 1974 are clear danger signals, foreshadowed by similar series of events in many fisheries in the past. Steps that should have been taken long ago only now are being contemplated, when it may be too late to save some segments of the industry.

History of the Surf Clam Fishery

No more revealing case history of American failure to manage an important marine fishery resource could be cited than the history of the surf clam fishery of the Middle Atlantic Bight. This is a classic illustration of the evolution of most domestic coastal fisheries. The story began only about 30 years ago and it illustrates how poorly we have learned the lessons of history.

Compared with recent production, the surf clam industry was insignificant prior to World War II. The resource was known and a harvest was recorded as early as 1908. But sand in meats was an unsolved problem and supplies of other clam species apparently were ample to meet demand. World War II provided incentives for the development of a surf clam fishery: shortages of other animal proteins and higher prices for fishery products. Prices paid to fishermen for surf clam meats, even when adjusted for inflation, more than tripled between 1939 and 1944. With this stimulus a method for removing sand was found quickly, and landings rose rapidly. Declining production of soft clam (Mya arenaria) in New England in the 1950s also may have helped to provide markets. As surf clam abundance on the original beds declined, the industry rapidly found new concentrations of the resource, and with some government help eventually extended its operations southward to Virginia (Figure 1). The two largest stocks were off the coasts of New Jersey and Virginia. Landings in New Jersey reached a peak in 1966 and have declined irregularly since then. An even more concentrated but less extensive bed of surf clams off the Virginia coast was first harvested in 1969. By 1972 Virginia exceeded New Jersey in production, and by 1974 landings in Virginia were greater than the historic high in New Jersey. This marked the turning point. By 1976 total production in the Middle Atlantic Bight area had dropped almost 50 percent, from 96 to 49 million pounds (43,500 to 22,200 metric tons) of meats.

Meanwhile, vessels were being added to the surf clam fleet. From 1965 to 1975 the fleet grew from 68 to 99 vessels and fishing power grew even more (Rinaldo et al., 1977; MAFMC, 1977). Larger vessels were added, some used two dredges simultaneously instead of one, and cutting blades of dredges were considerably wider. Clams were handled more efficiently in large wire cages instead of burlap bags.

No complicated mathematical analysis is needed to conclude that this industry is in trouble. One clue to

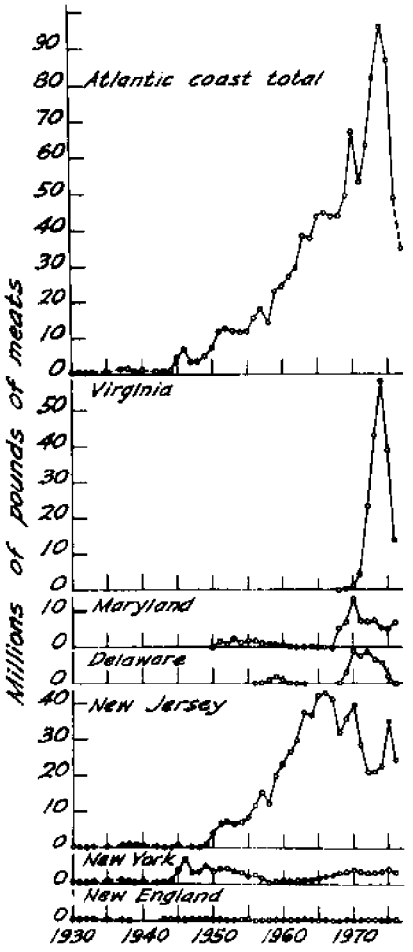

Figure 1. Historic landings of surf clams along the US Atlantic coast. Total catch for 1977 was predicted to be 35 million pounds

the declining supply was the sharp rise in prices (Figure 2), from an average of 14.5¢/pound (32¢/kg) of meats in 1975 to about 47.5¢/pound ($1.04/kg) in 1976. Adjusted for inflation, this was still almost a tripling of price. Stimulated by this apparent bonanza, new capital was attracted into the industry, and early in 1977 it was estimated that more than 160 vessels would be harvesting surf clams this year.

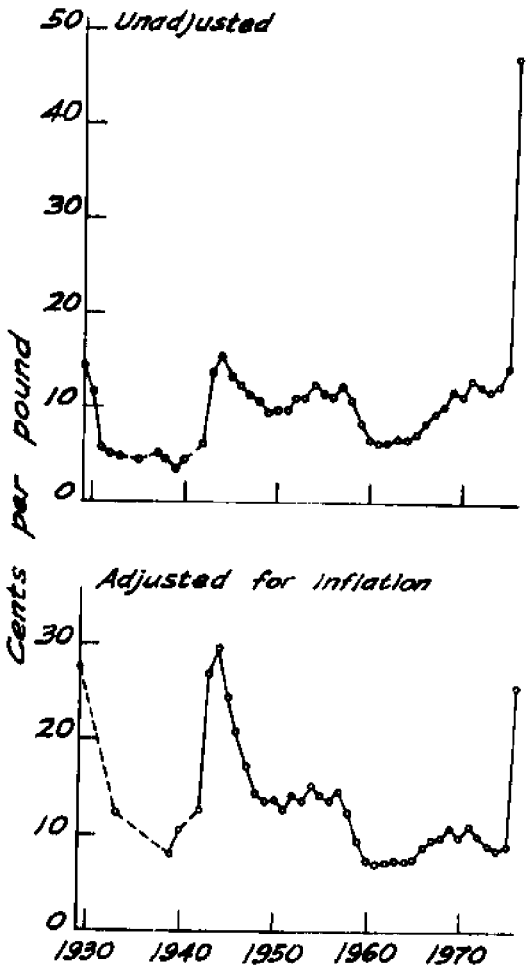

Figure 2. Unadjusted and adjusted prices paid to clammers for surf clam meats (average annual price per pound); adjusted by consumer price index for urban wage earners and clerical workers, all items. SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

The Ocean Quahog Resource

An almost entirely unutilized resource--ocean quahog or mahogany clam--inhabits the same general area as the surf clam, but farther offshore and farther north. It

has been estimated that the maximum sustainable yield (MSY) of this resource may be as high as 150 million pounds (68,000 metric tons) of meats (Anonymous, 1971). A later estimate (Rinaldo et al., 1977) was about 86 million pounds (39,000 metric tons), which by breakage during dredging might be reduced to 34 to 52 million pounds (15,400-23,600 metric tons). There is reason to believe that the total allowable catch may be substantially less than this (MAFMC, 1977). It could be concluded that the surf clam industry has no immediate problems, for ocean quahog can be and has been substituted for surf clam meats. Like all generalities about fisheries, however, this is an oversimplification.

Most of the ocean quahog resource lies in deeper waters, farther out on the continental shelf. This adds to the cost of harvesting and is more risky, especially to smaller vessels in bad weather. Ocean quahogs have much stronger adductor muscles than surf clams; thus they cannot be shucked economically by hand and meat yields are lower. The heat-treatment process, developed expressly to take care of the shucking problem, requires costly equipment, whereas surf clams are hand-shucked. Other problems are the color and sometimes strong flavor of ocean quahog meats, which have led most producers to mix the meats with surf clam meats. Thus, smaller surf clam vessels and producers who shuck by hand may be at an economic disadvantage in the switch from one resource to the other; and some may not be able to use ocean quahog as an alternate resource.

Knowledge of the biology and population dynamics of ocean quahog is fragmentary and the previously cited estimates of sustainable yield are at best questionable. Under the circumstances, processors might question the advisability of investing in new equipment, and bankers might be reluctant to make loans on somewhat uncertain future prospects. The effects of mechanization on employment in coastal communities also might have adverse social consequences and costs.

Commercial utilization of ocean quahog began in 1943 (Figure 3) as a part of the World War II food program. The fishery began off Massachusetts and Rhode Island. Landings reached a peak of 1.5 to 2.0 million pounds (680-900 metric tons) of meats in 1946, most of it landed off Rhode Island. Production then fell off because the developing surf clam industry produced an abundant supply of a more acceptable product. Landings of quahog began to rise again in 1969 and reached about 5.7 million pounds (2,585 metric tons) of meats in 1976, largely because a new fishery off New Jersey landed 4.1

million pounds (1,860 metric tons). In the first five months of 1977 total landings were 8.8 million pounds (3,990 metric tons) with a landed value of $2.6 million--over 1.0 million pounds (455 metric tons) in Rhode Island and over 7.7 million pounds (3,500 metric tons) in New Jersey. Landings in 1977 may reach 20 million pounds (9,100 metric tons) or more. If effective regulations are not adopted immediately, the ocean quahog fishery is likely to repeat the sorry history of the surf clam industry. The crash could be much more sudden.

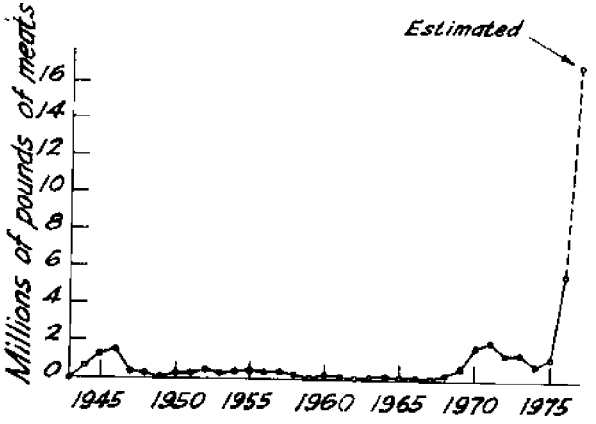

Figure 3. Total Atlantic coast landings of ocean quahog meats since 1944; on the basis of reported landings for the first five months of 1977, it is estimated that total landings for the year will be at least 17 million pounds

Present Status of Knowledge

Much of the fishery-associated research on surf clam and ocean quahog has been exploratory fishing, but some life history studies have been made. Present knowledge was summarized in the final management plan (MAFMC, 1977).

Some surf clams are sexually mature at one year of age; all are mature at two years. The major spawning period usually is from mid-July to early August; a minor spawning occurs from mid-October to early November. Spawning is temperature-dependent and variable: in one year of record only one spawning took place, from mid-September to mid-October. Eggs develop quickly and

larval life is estimated to be about three weeks. Young surf clams are very active and move within and above the bottom after setting. Growth is variable among areas; average growth is about 0.5 to 1.25 inches/year (13-32 mm) along the long axis of the shell and is most rapid in young clams. Lengths at the end of the first three years are about 1.75 to 3.67 inches (45, 69, and 91 mm).

Virtually nothing is known about mechanisms or levels of recruitment to the commercial stocks, but it has been concluded that recruitment now occurs at an earlier age than before and that recruitment rate varies considerably. At least one biologist believes that recruitment is so spasmodic and patchy that for practical purposes surf clam is a nonrenewable resource. This obviously cannot be absolutely true, but it is disturbing to consider that potential recruitment may be seriously reduced by breakage and burial of young clams. Some people in the industry say that the beds on which the stocks have been reduced below commercial abundance have never shown signs of recovery. The estimated standing crop declined about 50 percent between 1965 and 1976--from 1.8 million to 0.9 million metric tons. The management plan recommends annual quotas of 1.8 million bushels or 30 million pounds (about 13,600 metric tons) of meats. A provisional estimate of maximum sustainable yield (MSY) was 50 million pounds (22,680 metric tons) of meats.

The life history of ocean quahog is even less well known. In southern New England spawning begins in late June or early July at a water temperature of about 13.5°C (56°F), reaches a maximum in August, and ceases in October with falling temperatures. Some workers believe that this clam is long-lived, surviving for close to a century; others have suggested that the life span is much shorter. It is important that this question be resolved, because it is the basis of important assumptions from which to make estimates of optimum yields and allowable catches. Present estimates of the allowable harvest from the area south of Long Island are about 43 to 66 million pounds (19,500-30,000 metric tons) of meats, or perhaps considerably less (MAFMC, 1977), but the assumptions on which these estimates were based are not well established.

Industry Attitudes

Fishermen typically resist regulation. The reasons are many. They stem from an early and abiding faith that the living resources of the ocean are limitless, and a desire to be regulated as little as possible. This philosophy is compounded by the knowledge that if the re-

sources are available to be caught today, they may not be in the same place tomorrow, or that someone else may catch them. Left to their own devices, most people in the fishing industry seldom show an interest in regulation until they are affected economically. Even then, they may resist catch limitations. The common attitude in 1963 was expressed by a spokesman of the processing segment of the surf clam industry at congressional hearings on the shellfish industry (US Congress, 1963):

> [The industry] . . . was started in Long Island, and after a period of 10 years we depleted the supply in that area. During this time we did some research and found an area off south New Jersey and Delaware to which we moved, 15 years ago. We worked in this area for nine years and it was depleted. During this period we researched north New Jersey and found another area where we started to work in 1958. . . . In my estimation, this area will be used up by the fall of 1964 or months thereafter.

He pleaded for government assistance in finding new beds for the industry to destroy, although he did not put it exactly in those terms.

Congressman John Dingell, who presided over the hearing, expressed some concern over this statement. He was reassured by a further comment by the witness, who expressed his personal opinion that the clams on each bed came from a single year of setting. The inference was that the resource on these beds was not being renewed each year and, if the clams were not harvested, they would die eventually of natural causes. Dingell's final statement was indicative of his reaction: "I was just apprehensive that you had gone out and depeleted an area, then proceeded to find a second and third area, and now you were beginning to have the desire to have the government look for a fourth area. This committee would be criticized if we looked with sympathy on that. But because of your explanation, I can understand the problem that you face."

Dingell should not have been reassured so easily. Virgin stocks of shellfishes are usually made up mostly of large, old animals, very much of the same size. Recruitment is inhibited by the presence of large numbers of adults, which compete successfully with their progeny for food and space, and by predators. It is easy for the uninformed to misinterpret the reasons for the uniform sizes. The surf clam industry has continued to reduce the stocks in area after area, and has moved on to

new grounds as the need arises. The surf clam program of the federal government, which began in 1963 (Parker, 1966), was a cooperative effort with the Eastern Sea Clam Packers Committee of the Oyster Institute of North America. This was essentially an exploratory fishing operation, based on the concept of "research" expressed by the previously quoted witness. Although some biological studies also began about that time and the life cycle of the species was generally understood (Yancey and Welch, 1968; Ropes et al., 1969), the population dynamics of the resource, including recruitment rates and effects of fishing upon the stocks, were not well understood. It is also possible that the witness was correct in assuming that recruitment was negligible on some beds.

At public hearings on the surf clam management plan--held as required under the terms of the FCMA--the surf clam industry has been well represented, as it has at meetings of the Mid-Atlantic Fishery Management Council in which the subject was on the agenda. Industry has not seriously questioned the need for controls, although many industry representatives have questioned the adequacy of the scientific background of stock estimates, estimates of the sustainable yield, and recommended quotas based upon those estimates. One point raised over and over again is that the results of scientific surveys are suspect because "commercial vessels working alongside the survey vessel caught four to ten times as many clams." Leaving aside the question of the accuracy of scientific sampling, an issue which it must be assumed the scientists are competent to judge, this criticism by industry appears to be based on a misconception. Adequate scientific sampling does not need to take commercial quantities, which in fact might interfere with proper conduct of the scientific work. This points up a basic problem of fishery research and management--a tendency for industry to doubt the validity of scientific sampling because it is done in a different way from commercial harvesting. This is a communications problem. The question of the adequacy of scientific sampling needs review. Assurance is needed that estimates of abundance of all sizes of clam are reasonably accurate.

Industry responses to the plan largely agreed with the need for some kind of regulation. Criticisms were directed at accuracy of catch data, estimates of fleet size, estimates of stock size and potential yield, and lack of estimates of the economic impact of regulation. One speaker even suggested that, in lieu of regulations, "The free market economy be allowed to take care of the surf clam problem." Each segment of the industry--small

boat operators, large boat operators, small hand-shucking plants, large mechanized plants, secondary processors, and diversified operations--had unique problems, and proposed different methods of arriving at equitable allocations. No witness recognized the full implication of the National Standards as expressed in the FCMA, Sec. 301(a)(2), that "conservation and management measures shall be based on the best scientific information available." To me this means that available scientific information, however incomplete at the moment, be used as fully and wisely as possible. If information is inadequate, then conservative action would appear to be mandatory, not the reverse.

If conservative steps had been taken when the first concern was expressed in the early 1960s, the sea clam industry might not be in its present difficult situation. It is certainly not prudent now, when the gravity of the situation is almost unanimously recognized, to argue that an incomplete scientific background justifies further delay. It is illogical to propose that it is "better to let the industry fish the clam stock down to economic extinction than to impose regulations that will have the same result." This attitude ignores the fact that well-designed, well-administered regulations applied to overharvested stocks should provide long-term gains at the cost of short-term sacrifice, which clearly is not the same as "regulations that will have the same result" (e.g., economic extinction). Nothing in the FCMA contemplates giving the industry free rein to destroy itself. Indeed, the mandate to the Regional Fishery Management Councils (RFMCs) is to halt and to reverse a process that already has gone too far.

A Conceptual Management Plan

The surf clam management plan, which also includes provisions for management of the developing ocean quahog fishery, must operate from certain basic assumptions. These are: (1) the surf clam resource is overharvested, and this trend must be halted and reversed; (2) the ocean quahog resource is poorly understood, the harvest is increasing at an alarming rate, and preliminary regulations must be conservative in recognition of these facts; (3) the present harvesting power of the fleet is considerably greater than necessary to take the optimum sustainable yield of surf clam; (4) the present harvesting capacity of the fleet probably also is greater than necessary for optimum utilization of the ocean quahog resource; and (5) the present economic structure of the sea clam industry is diverse, and special steps must be

taken to ensure "that no particular individual, corporation, or other entity acquires an excessive share of such privileges" [FCMA, Sec. 301(a)(4)(C)].

Surf Clam

Recognizing the weakness of some of the assumptions on which the present management plan is based, it appears prudent to accept the recommended annual quota of 30 million pounds (13,600 metric tons) of meats for the surf clam catch. This should be subject to adjustment in each succeeding year, as new data become available and improved stock assessments are made. The latest figures available suggest that by mid-1977 the total catch of surf clam was over 27 million pounds (over 12,200 metric tons), not including landings in Delaware--data on which were not readily available. And at the time of writing the recommended quota almost certainly had been exceeded. This suggests that the 1978 quota may have to be less than 30 million pounds (13,600 metric tons), perhaps much less. Some segments of industry can ease the economic burden by catching or processing ocean quahog. Allocation of the two species to catchers and processors should be done equitably, with the unique capabilities of each segment of the industry in mind.

Ocean Quahog

The assumptions on which the recommended quota of 30 million pounds (13,600 metric tons) for ocean quahog was based are admittedly weak. In the absence of better information it would be prudent to assume that the OY of ocean quahog is no greater, and perhaps less than, the estimated OY of surf clam. This would provide for 1977 a total quota for both species of not more than 60 million pounds (27,200 metric tons) of meats which, if properly allocated, should bring minimal economic hardship to the various segments of the industry. The 1976 catch of ocean quahog--about 5.7 million pounds (2,585 metric tons)--was well below this proposed conservative quota of 30 million pounds; and the 1977 catch, although by mid-year was already nearly 11 million pounds (5,000 metric tons) of meats, may not reach the 30 million level. Thus, a 30 million pound quota should not place undue constraints on those who catch and process ocean quahog. This is the advantage of setting conservative provisional quotas at an early stage in the development of a fishery. Nobody is hurt by a preliminary conservative limit and as scientific evidence accumulates it is

easier to raise the quota, if that is justified, or at worst to hold it at that level, rather than to cut back because the provisional quota later is demonstrated to be too high.

Control of Harvesting Power

A matter of great concern should be the rapid growth of the sea clam fleet. Scarcity of the living resource led to a sudden and abrupt increase in the price of surf clams. Although the total catch in 1976 was almost 50 percent less than in 1974, the total price paid to harvesters for their catch was considerably greater, even in deflated dollars. This attracted idle capital to the industry at a time when increased effort was unnecessary. The estimated increase of 50 percent in numbers of vessels between 1976 and 1977 does not fully measure the increase in effort. The new vessels are larger on the average, can catch more clams per unit time, and are seaworthy enough to take underexploited ocean quahog as an alternate resource. The new fleet has many advantages over most traditional surf clam vessels and, in light of the present condition of the resource, injection of this new element into the fishery can scarcely be regarded as equitable. According to some estimates, another 50 vessels or more may be added in the coming year. These investors may come to regret their decisions, but that will be no consolation to those veterans of the industry who have been hurt thereby. It is probably far too late to put meaningful controls on effort for either species, but that should not prevent positive action to freeze effort as soon as possible and to plan for reductions to optimum levels by attrition or other means. Off New York and Maryland, where effort has been relatively light and the resource appears to be holding up well locally, the states should act promptly. The effects of dredging on the survival of clams, especially prerecruits, urgently require attention.

Equitable Division of the Catch

The sea clam industry of the Middle Atlantic Bight appears to have at least six distinct segments, some of which may overlap. Some of these categories appear to be less flexible than others, and thus deserve special consideration. The subgroups fall into three major groups: harvesters, processors, and consumers.

Surf clam vessels must be divided into subgroups according to their size, power, seaworthiness, and har-

vesting capacity. In 1975 vessels ranged all the way from 9 to 386 tons (MAFMC, 1977); 37 to 155 feet (11 to 47 meters) long; 60 to 1,530 horsepower; crew size, 2 to 5 men; and dredge blade width, 34 to 60 inches or about 1.0 to 1.5 meters (by 1977 some blades were more than 100 inches long, and the larger vessels operated two dredges simultaneously instead of one). Subdivision into two categories--large and small--obviously would be an oversimplification. In response the management plan considered three categories based on tonnage: 50 tons or less, 51 to 100 tons, and larger than 100 tons--still an oversimplification, but probably the only practical solution. Most new vessels are in the two larger classes. Fishing power is related to vessel size, with larger vessels on the average being more efficient. Another advantage of the larger vessel is its greater capacity to operate in bad weather, hence a greater opportunity to switch to alternate resources like ocean quahog, which are farther offshore. The consequent disadvantage to smaller vessels should be compensated in some way. Preliminary drafts of the management plan attempted to do this by suggesting different weekly quotas by vessel class, but it is questionable whether this would be adequate, for it probably fails to take fully into account the relative unavailability of the underharvested ocean quahog resource to small vessels. The plan submitted to the Secretary did not include vessel quotas.

More thought needs to be given to the matter of equity. A decision might be made to allocate surf clam quotas to smaller vessels in somewhat greater proportion to their fishing power, or perhaps exempt vessels of a certain minimum size from restrictions on fishing days or size of catch.

A more difficult question concerns the "rights" of veterans of the industry to the resource and to earn a decent living, vis-a-vis the "rights of newcomers," who must be attracted as much by the prospect of return on capital. Consider the plight of the individual who entered the fishery at an early stage. He has capital invested in equipment; people depend upon him for their living; he is not responsible as an individual for overharvesting; and he may find it difficult or impossible to enter an equally rewarding occupation. He is the victim of the newcomers; he shares equally the adverse effects of their marginal entry. In fact, he suffers more, because new entrants generally are more efficient and flexible and more likely to survive. This form of inequity is difficult to assess quantitatively. An inher-

ent characteristic of our free economic system is that the efficient operator survives and the less efficient does not; but from an ethical viewpoint it may be logical to ask whether or not government has a responsibility to assist and protect the pioneer group in an industry based on a finite, renewable resource.

If so, government should have acted much earlier. Under the terms of the FCMA it seems clear that government, with guidance from the RFMCs, is obliged to act responsively, no matter how unpopular the final decisions may be in some quarters. The sociopolitical aspects of this dilemma deserve more serious consideration. Does the veteran of the surf clam industry deserve more consideration than the newcomer; if so, of what kind? According to one view, he does need protection against overinvestment of capital and labor and, since he cannot do it himself, government must. Another view is that because government did not step in earlier, the veteran has no more rights than the newcomer and is equally responsible for the excessive harvest. Whatever the philosophical conclusion about rights and responsibilities, it is abundantly clear that the RFMCs must show leadership and courage and act quickly. The issue goes far beyond the sea clam industry; it concerns all fisheries over which we have jurisdiction.

Essentially the same problems beset the processor and distributor of sea clams and sea clam products. The small processor is less flexible than the mechanized, diversified operator, and he and his employees are more likely to go under. Do the RFMCs and government have special responsibilities to protect his welfare? Clearly they do, in the sense that "no particular individual, corporation, or other entity [should acquire] an excessive share of such privileges." Surely the opposite meaning also is implicit in the foregoing quotation from the FCMA, that no particular individual, corporation, or other entity should suffer unduly from the effects of regulations recommended by RFMCs or established and enforced by government. One way to protect the interests of the hand-shucking plant operator would be to allocate to him an extra share of the surf clam quota, recognizing that he cannot process ocean quahog. Obviously, there will be difficulties and objections to this approach, and other alternatives must be considered.

The interests of the consumer too often are ignored in fishery management. Maintenance of the sea clam resource at optimum levels and efficiency of harvesting and processing are worthy objectives. It is in the interest

of the consumer to have a uniform supply, adequate to meet demand, at a price he is willing to pay.

Conclusions and Recommendations

The history of the surf clam industry provides a "textbook" example of the consequences of uncontrolled development of a fishery. That this is a purely domestic fishery, which never has been complicated by foreign participation, does not diminish in any way the responsibility of the US to manage the fishery under the provisions of the FCMA. Indeed, earlier failure to act makes the issue more urgent. Despite objections and differences of opinion on details, no acceptable argument has been advanced in support of the views of some that no action should be taken.

With concurrence of the New England Fishery Management Council, the MAFMC has acted and its recommendations are before the Secretary of Commerce. It is probable that any action of the Secretary will be challenged in the courts. This should be welcomed by the RFMCs and government because it will help to clarify the issues and call attention to deficiencies in both the FCMA and in administrative procedures. But it also will delay action, make the situation more critical, and make remedial action more drastic. As a member of the MAFMC, I believe that our recommendations to the Secretary did not go far enough, although I was not sure how my doubts could have been resolved at the time. In that sense this paper is a minority report, as provided under the FCMA, Sec. 302(e)(4). I hope that it will stimulate thought and appropriate action.

The plight of the surf clam industry is all the more tragic because it is a recent development, which repeated all the mistakes of the past, as if the past had not existed. Research, when it began, was started at the request of the industry, and it stressed exploratory fishing. This in itself was not wrong, for adequate stock assessment is one of the essential pieces of information required for management. The weakness of the program was that it did not give equal attention to the other four essential pieces of information--recruitment, growth, natural mortality, and fishing mortality. The program did not anticipate a need for management of the harvest. Adequate attention to these important needs is a recent development, generated by the work of the Surf Clam Subboard. In fact, there is some question as to whether the present research program is supported adequately to provide all information needed for effective

management. Responsive action should have been taken at least 15 years ago. It was not taken and, because it took a crisis to arouse serious concern, an important fishing industry once again has suffered.

Treatment of the disease will be painful, and at this late stage some patients may die. The RFMCs and government should not succumb to the age-old economic argument that the patient cannot bear the pain and thus will be better off without treatment. This would merely follow history by giving short-term interests priority over the long-term good of the industry. Complex as it is, the surf clam management problem is relatively simple compared with other management responsibilities that face the RFMCs and government. This is a critical test case. The future of the Council structure--this "new form of government," as Senator Warren Magnuson called it--is at stake.

In the preoccupation of dealing with the sea clam problem and other pressing issues before them, the Councils should not neglect broader issues. Rapid proliferation of foreign fishing off the coasts of the US prior to enactment of the FCMA of 1976 showed clearly that modern fishery developments can be too rapid to be dealt with by traditional concepts that require undeniable scientific evidence. Even when more time was available to develop the scientific basis for management, the scientific case was never complete, and effective action frequently was forestalled by questioning the basic assumptions. Now the time has come for a new approach to management, taking full advantage of the lessons of history to develop rule-of-thumb techniques. Management must come before crisis demands it--before impossible biological, economic, and sociopolitical conditions arise. Scientific knowledge of ecosystems, although far from complete, has reached the point that rule-of-thumb models can be constructed, based on critical appraisal of both past successes and failures in fishery management (mostly failures).

Conservative, nonconstraining catch limits and other regulations should be adopted in time to prevent crisis and at the same time information necessary for improved management should be developed. If conservative limitations are established before they hurt the industry and its consumers, the trauma associated with crisis-dominated action should never arise. It is too late to apply this approach to the surf clam industry, but not too late for the ocean quahog resource. That is all the more reason for the Councils to look ahead and give due priority to advance planning. This could be a

suitable and important endeavor for joint Council action, addressing an issue fundamental to all interests.

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THE GULF OF ALASKA GROUNDFISH MANAGEMENT PLAN

Harold E. Lokken
Chairman, North Pacific Fishery
Management Council

Public Law 94-265, the Fishery Conservation and Management Act (FCMA), has been in effect for less than a year. While it is too early to assess the full impact of this revolutionary legislation upon fishery conservation and management, it is not too early to take a critical look at how the FCMA has been implemented to date. Therefore, this conference is timely. As early examination will at least show the way for needed changes before a protracted period of time, by building up new vested interests, freezes the elements of the present system to the point where changes will be extremely difficult if not impossible to secure. It is hoped that this conference will lead to a continuing examination of the new law in greater detail than is possible in the short time that is available in this forum. At stake is a system, now in transition, that will affect the course of marine conservation and management worldwide for many years to come.

Despite the importance of the FCMA and the wide publicity it received during its movement through the Congress, many people still misunderstand the intent of the law. There are those who still believe that the FCMA provides for the removal of all foreign fishermen from the United States (US) 200-mile zone. There also is a widespread belief that as of March 1, 1977, when the FCMA became effective, jurisdiction over coastal fisheries passed from the federal government to regional groups. Both of these erroneous concepts of the FCMA will create difficulties for those who are attempting to carry out the FCMA's intent. Only time can correct these misconceptions through constant repetition of accurate interpretations of the FCMA by those charged with the responsibility of carrying out its mandates. The misconceptions, too, will become apparent as the many management plans progress through the Regional Fishery Management Council (RFMC) system to ultimate approval by the Secretary of Commerce or under some circumstances, where plans are extremely controversial, by the courts.

Few plans have advanced through the system. In the North Pacific Fishery Management Council (NPFMC), 10 management plans are either under consideration or scheduled for consideration at a later date. These plans concern

shrimp, halibut, deep-sea clam, scallop, king crab, tanner crab, high-seas troll salmon, high-seas net fishing for salmon by foreign vessels, Gulf of Alaska groundfish, and Bering Sea and Aleutian Islands groundfish. Of the ten, two are complicated by treaty involvement with foreign countries--the high-seas salmon fishery by Japan and the halibut fishery by Canada. The two may require bilateral arrangements of some kind with the foreign countries involved.

Because it is impossible to examine all plans to an acceptable degree, I have chosen to examine the Gulf of Alaska Groundfish Management Plan (GAGMP) as illustrative of a management plan--its trials and tribulations as it moves through the several stages of RFMC consideration. The GAGMP is appropriate for this type of inquiry, as it is a multispecies plan of considerable complexity. It covers the entire Gulf of Alaska from the Islands of the Four Mountains in the Aleutian Islands to Cape Spencer in southeastern Alaska, a distance of close to 1,300 miles following the contour of the coastline along the 100-fathom depth curve. The major commercial species of groundfish in the area other than halibut include Pacific Ocean perch, pollock, sablefish, Pacific cod, Atka mackerel, and several species of sole and flounder. The GAGMP includes fishing by both foreign and domestic vessels. The area is a developing one insofar as the US fishing industry is concerned. And it is a place where foreign interests are attempting to organize joint ventures in which US fishermen would catch fish for delivery and processing on foreign ships operating outside the jurisdiction of many shoreside regulatory and taxing authorities.

By reason of the interest shown by foreigners in maintaining and expanding their fisheries in the Gulf of Alaska and their desire to utilize parts of their fishing fleet excluded from fishing areas elsewhere by extension of coastal jurisdiction, coupled with similar interest on the part of domestic fishermen and processors who would like to exploit the underutilized resources of the area, the NPFMC decided to give high priority to the development of a permanent management plan for Gulf of Alaska groundfish resources. The permanent management plan would replace the Preliminary Management Plan put into effect by the Secretary of Commerce following the effective date of the FCMA. As a consequence, the NPFMC first initiated discussion of the GAGMP late in 1976.

The initial step in the creation of a plan was its referral to the NPFMC's Scientific and Statistical Committee (SSC). On the NPFMC this committee consists of

representatives from the National Marine Fisheries Service (NMFS), the Alaska Department of Fish and Game, the Washington State Department of Fisheries, the Oregon Department of Fish and Wildlife, the University of Alaska, and the University of Washington. The SSC in turn recommends to the NPFMC a drafting team to gather background data, examine possible management options, and present such other pertinent information as will be helpful to the NPFMC in making a final decision on the GAGMP and enabling it to defend the GAGMP when the inevitable criticism of it is voiced. The drafting team for Gulf of Alaska groundfish had in addition to its regular members two members of the NPFMC's Advisory Panel, selected by the panel, who participated in the work of the team. The two had experience in the harvesting segment of the fishing industry. The inclusion of these two was designed to facilitate consideration of the GAGMP when it reached the NPFMC's Advisory Panel.

The SSC, in setting up the drafting team, designated the NMFS as the lead agency in the preparation of the GAGMP. The NMFS Northwest and Alaska Fishery Center in Seattle had already anticipated this when it set up a division in the center called Resource Ecology and Fishery Management. This new division was charged with the responsibility of handling matters concerned with management problems in the newly extended 200-mile economic zone in general and liaison with the North Pacific and Pacific Fishery Management Councils in particular. Most of the work primarily concerned North Pacific matters, as the major species covered by the Pacific Council were being handled by fisheries divisions of the states.

The GAGMP, in the interests of economy and simplicity, was drafted as a combined management plan and environmental impact statement. Had the two been separated, it would have required a duplication of much of the information of the management plan in a separate environmental impact statement. Combining the two made possible a short environmental statement which included references to the parts of the management plan where supportive statistical data could be found.

The first draft of the GAGMP was submitted to the NPFMC for internal review at its May 26-27, 1977, meeting. The GAGMP was then referred to the SSC and the Advisory Panel for review before being circulated to the general public. As the meetings of the NPFMC, the SSC, and the Advisory Panel are open to the public, all those who were interested in the subject could attend and monitor the discussions.

The Advisory Panel of the NPFMC consists of 25 individuals selected by the NPFMC to represent a cross section of those interested in the work of the NPFMC. The range of selection was designed to give representation as far as possible to all segments of the fishing industry by areas, species, sport interests, commercial interests, fishermen, boat owners, educators, processors, and resource managers.

In its deliberations on the GAGMP, the Advisory Panel made several recommendations for changes in the plan. This was done also by the SSC. At its June meeting, the NPFMC gave preliminary approval to the plan, ordered it circulated to the general public, and set dates for public hearings. These were held August 3 to 24 in five locations from Seattle, Washington, to Sand Point, Alaska. The hearings covered testimony on a Tanner Crab Management Plan and on foreign-domestic joint ventures, in addition to the management plan for Gulf of Alaska groundfish. A total of approximately 60 persons testified at the 5 hearings.

The draft GAGMP, including its environmental impact statement, was given final approval by the NPFMC at its September 22-23 meeting and was scheduled to be submitted to the Secretary of Commerce on October 24. A 60-day review period began on that date. On December 23 "Notice of Regulations" will appear in the Federal Register, followed by another review period--this one for 45 days. Then if everything falls into place, the regulations become effective on February 7, 1978, over a year following the date of first consideration of a permanent management plan. The sequence of these events assumes that there will be no great difficulties with procedure or with legal challenges of the validity of the proposed regulations. In the event of the latter, the effective date could be delayed substantially.

The management plan for the Gulf of Alaska Groundfish Fishery for 1978, including the accompanying environmental impact statement, consists of 12 sections totaling 284 pages. It is designed to meet the requirements of the FCMA and its National Standards by achieving four basic objectives: (1) providing for optimal yield from the resource in terms of securing the greatest overall benefit to the nation with particular reference to food and recreation; (2) promoting efficient use of fishery resources, but not solely for economic purposes; (3) promoting fair and equitable allocation of resources in such a manner that no particular group acquires an excessive share of the privileges; and (4) basing the plan on the best scientific information available.

In accomplishing these objectives, a number of secondary objectives have been considered: (1) unpredictable characteristics of future resource availability influencing the viability of the industry have been taken into account; (2) where possible, individual stocks of fish are managed as a unit through their range with due consideration to other impacted resources; (3) where stocks have declined to a level below that capable of producing the maximum sustained yield, measures are designed to rebuild the stocks with factors other than biological being taken into account in considering the rate of rebuilding; (4) measures are designed to avoid disruption of existing social and economic structures where fisheries appear to be operated in reasonable conformity with the FCMA and where they have evolved over a period of years; (5) measures should contain a margin of safety when the quality of information concerning the resource and the ecosystem is questionable; and (6) fishing strategy has been designed so as to have minimal impact on other fisheries and the environment.

In essence, the GAGMP provides for a catch of approximately 324,000 metric tons. Of this total it is assumed that the domestic fleet will take 50,000 metric tons and the balance of the catch will be allocated to foreign vessels. The following listing gives a breakdown of maximum sustainable yield (MSY), optimum yield (OY), domestic allowable harvest (DAH), and foreign allowable catch (FAC) in thousands of metric tons:

Species	MSY	OY	DAH	FAC
Pollock	169-338	168.8	17.7	151.1
Pacific Cod	34.8-69.1	34.8	15.5	19.3
Flounder	67.0	33.5	9.2	24.3
Pacific Ocean Perch	125-150	25.0	1.1	23.9
Rockfish	7.6-10.0	7.6	2.0	5.6
Sablefish	22-25	13.0	3.6	9.4
Atka Mackerel	33.0	24.8	0.0	24.8
Squid	2.0	2.0	0.0	2.0
Others	NA	14.5	0.5	14.0
Total		324.0	49.6	274.4

In compiling these figures NPFMC scientific advisers stated that there is evidence, circumstantially at least, that the Gulf of Alaska ecosystem has changed significantly over the past decade. Pacific Ocean perch, previously the dominant groundfish form, were overfished in the 1960s to the extent that they now comprise only 20 percent of their virgin abundance. Perch, therefore, have lost their prominence and appear to have been replaced by pollock and Atka mackerel. While it is only

conjectural at this time, there is reason to believe that the strictest of measures may not result in an increase in perch abundance; but if this happens, it could be at the expense of pollock, cod, or other species. The scientists warned that the groundfish complex has not been stable over the recent past and the increased exploitation--even though confined to individual species--combined with the vagaries of environment may result in a continuing period of instability.

Based upon these assumptions, the OYs of pollock, Pacific cod, and rockfish were set at the low estimate of MSY. The OY on flounder on the other hand was set at half of MSY. This was done to allow for an assessment of the effect of a larger fishery for flounder on halibut stocks before a full fishery for flounder developed. Flounder were treated as one stock for management purposes, although in reality the stock predominately consists of turbot, rock sole, and flathead sole--all with different characteristics. Because little is known about the general effect of increased effort on individual species, the flounder group is to be managed as a single entity until better management devices become apparent. The OY of sablefish was deemed to be 40 percent of MSY and Pacific Ocean perch only 20 percent of MSY in order to provide for a rebuilding of the two species following overfishing in the past. Inasmuch as there has been no domestic fishery for Atka mackerel, with all information on the species being obtained orally from Soviet scientists, the OY for Atka mackerel was set at 25,000 metric tons, or 75 percent of estimated MSY, in the interests of conservatism. All these figures, of course, are subject to revision as more information becomes available.

A related issue that has surfaced concerns the use of market force as a means of increasing US participation in a fishery at the expense of foreign fishermen. Proponents of the theory contend that, if foreign fishermen are completely excluded from a fishery in which US fishermen have not participated previously or have done so only to a minor degree, the market price of the species involved will rise to the point where US fishermen can participate on an economically viable basis. The consequences of this proposal to benefit US fishermen by man-made alteration of supply and demand factors have yet to be determined.

In the market of one distant-water fishing country, replacing domestically caught fish with imported fish could have an opposite effect from that intended, according to views expressed in that country. It involves the competition between a few distant-water fishing firms and a greater number of nonfishing importers. The fish-

ing firms generally build up and maintain a market for a particular fishery product, while the importers supplement this market whenever favorable conditions warrant. If the fishing companies were to lose their direct source of supply, their incentive to maintain a stable market would disappear. Higher prices that could result also could have an adverse effect. The end result could mean a lower rather than a higher price level for US fish in that market. If a domestic market could be built up to replace the loss of the foreign market, the change would have no ultimate adverse effect on US fishermen. Building up such a market, however, takes considerable time--a commodity in short supply for a fisherman interested in improving his immediate economic well-being.

The development of the GAGMP was handicapped by the lack of adequate biological data. Fishing in the past for groundfish in the area was primarily conducted by foreign vessels. While the foreign fleets provided certain records of their catches, the information either did not provide sufficient detail in a readily usable form or the data were suspect. Research by US vessels was invaluable in providing some data and also in evaluating the quality of information provided by foreign vessels operating in the area. The data deficiency is now being corrected and in time our scientists should have the data they need to make more accurate assessments of stock conditions in the Gulf of Alaska.

One fishery in which US fishermen are showing renewed interest is that for sablefish in the Gulf area. Fishing for this species in the past has been confined mainly to inside waters in southeastern Alaska, but with an increase in market prices for this species and with a shortened halibut season, many of the operators of halibut vessels are planning to enter the sable fishery. Some vessel owners operating in areas where halibut are scarce are even abandoning halibut fishing to take up sablefish fishing. This renewed interest in an area where foreign long-liners have operated quite successfully in past years is putting the NPFMC under great pressure to eliminate foreign fishing in parts of the Gulf of Alaska in order to accommodate the renewed interest of domestic fishermen. The OY for sablefish has been set at 10,000 metric tons, but this is for the entire Gulf. The area in which US fishermen have expressed an immediate interest--that of the eastern Gulf region--has a tentative OY of 5,000 metric tons. The projected domestic catch of sablefish for 1978 is less than this figure. The NPFMC, as a consequence, has a tough decision to make involving whether federal standards in the FCMA permit the setting aside of all or part of the total

allowable catch for domestic fishermen where the taking of the total catch is questionable.

Some argue that setting aside a fairly substantial portion for either immediate potential use by domestic fishermen or having the unused portion left in the ocean as a reserve for use in later years is justified; others argue that such a policy will cause a substantial loss of a material part of the total allowable catch. The drafting team for the GAGMP, in addressing this issue, expressed the view that where an examination of the biological data base indicates a degree of incompleteness, a conservative approach to exploitation should be followed. The question then arises as to whether a conservative approach is based upon the lack of data or the desire to reserve a greater part of the stock for domestic fishermen. The drafters of the GAGMP concluded that until there is evidence to support the contention that higher yields can be sustained, only catch levels that are equal to or less than the low estimate of sustainable yields can be considered relatively free from the risk of overexploitation. They further stated that the concept acknowledges the possibility of underexploitation, but in the biological sense overexploitation can lead to reduced abundance or even ecosystem imbalance that might prevail for years; while underexploitation leaves the resource base in a healthy condition, needs have only a temporary effect on user groups, and the temporary loss to the users can be made up to some extent the following year. The issue is not likely to be settled quickly.

The major problem facing the drafting team in the Gulf of Alaska Groundfish Management Plan was based upon the possible impact a developing domestic groundfish trawl fishery could have on a depleted domestic setline fishery for halibut. The problem is being handled as far as foreign trawlers are concerned by setting up areas where, and times of year when, trawling is prohibited. These times and places are those where previous records have shown high incidental catches of halibut by trawlers. Whether or not these restrictions would hinder the development of a major domestic trawl fishery in the Gulf of Alaska is a question as yet unanswered. The drafting team was unable to devise a single set of management objectives that would ensure adequate protection of halibut and, at the same time, not hinder development of the domestic groundfish fishery. Instead, the team offered two options. The first would protect halibut first and then provide for the orderly development of the domestic groundfish fishery; the second would allow for the full development of a domestic groundfish fishery first and protect the halibut fishery to the extent possible.

While at the time this is written no final decision has been made by the NPFMC, it seems logical that the first option, with some modifications, will be selected. The modifications most likely to be included are those which seek to restore the halibut fishery to at least a part of its full potential while fostering the growth of a domestic trawl fishery as rapidly as possible in areas where the impact on halibut is expected to be minimal. As the trawl industry expands, the effect on halibut would be monitored and a reevaluation would be made of the trawl-halibut problem.

Another major problem with the development of the domestic groundfish fisheries is an economic one. The undeveloped species are those whose values are low--pollock is an example. The price quoted for the species to be produced by US trawlers in the Gulf of Alaska runs from 5¢ to 6¢ per pound. This low price discourages US fishermen from initiating any effort to harvest pollock; yet, to be competitive on the US market, which is supplied primarily by imports, both US and foreign processors claim that a higher price is unwarranted. An experimental fishery for pollock in southeastern Alaska was initiated recently, but failed to flourish when the vessel operator found that he could produce greater earnings in other fisheries. In the past year of two, many vessels constructed for crab fishing in the Bering Sea have been built so as to permit conversion to trawling when conditions permit. This has not occurred to date, as no boat owner in his right mind would abandon fishing for king crab at 80¢ per pound and tanner crab at 30¢ per pound in order to fish for pollock at 5¢ to 6¢ per pound, particularly when king and tanner crab are relatively plentiful, while fishing for pollock in the Gulf of Alaska is an unproved venture in an economic sense.

One of the difficult tasks facing the NPFMC and its working groups in drafting a groundfish plan was to give consideration to socioeconomic factors. When foreign fishing began in the 1960s, the stocks other than halibut were in a virgin state. The resulting high catch rates helped foreign fishermen to offset the costs of fishery development. If the fisheries are to be developed to maximize physical yield, the domestic fishery will be forced to begin its development facing competition on the fishing grounds with foreign fishermen and in the marketplace with the resulting foreign product. Conversely, severe curtailment of foreign fishing at this time would result in a diminished supply of groundfish in the domestic market and higher prices to the domestic consumer. In most cases, as a result of this contradiction, optimum yields were set at levels designed to

assure maintenance of healthy stocks. The problem here is one that will be faced by all RFMCs. How it is resolved also will determine the success or failure of the RFMC system.

In most marine resources pressure from those who have an economic interest in a resource is much greater than that applied by those who are concerned with the biological welfare of the resource. As a consequence, some RFMC members are more likely to give greater weight to economic than to biological factors, which will probably cause little harm if done to correct a temporary imbalance. But if it is not reversed quickly, the harm done could become permanent and a short-term economic benefit could turn into a long-term economic loss. There is of course a built-in safety factor wherein the Secretary of Commerce has the authority to approve or disapprove action of an RFMC. This is only a partial solution, especially where the pros and cons are subtle and not clear-cut, as damage can be done before the harm becomes apparent. Great care should be exercised by RFMCs, when adjusting MSY figures, to give equal emphasis to both social and economic factors.

The part of the FCMA that gives the Secretary of Commerce authority to approve or disapprove decisions of an RFMC is being examined carefully at this time to determine how best this authority can be exercised so as to expedite fishery management plans in a way that will minimize the impression of some RFMC members that they are primarily rubber stamps to be used at will by the federal establishment in Washington. The crucial point in the problem is the level at which the federal judgment will be rendered.

In developing a management plan the fisheries centers of the NMFS in almost all cases either serve as the lead agency in the preparation of the plan or participate in a major way. In the next step in consideration of a plan on the RFMC level, a representative of the NMFS serves as a voting member of the RFMC and has equal debating rights with other members of the RFMC. It seems logical, therefore, that any difference between the Department of Commerce and an RFMC should be aired fully at the RFMC level rather than by veto of the Secretary of Commerce after a plan has been fully debated and voted upon by an RFMC. A veto therefore would be reasonable under only two circumstances. The first is where new information was received after the RFMC had voted and the second is where the RFMC was unreasonable in voting in favor of a proposal where the Department of Commerce, through the Regional Director, voiced its disapproval of the proposal, backed by substantial arguments.

Conflict also is possible between the State Department and the RFMCs. While the State Department does not have the direct interest in management plans that the Commerce Department has, it does have to be consulted, particularly when foreign allocations are to be made and when foreign policy is involved. Here, too, the input of the Secretary of State should be expressed at the RFMC level, rather than surfacing as a veto by the Secretary of Commerce. With a member of the State Department participating in RFMC deliberations as a nonvoting member with full privileges in debating issues, this should not be difficult. It would require that the two departments either vest greater authority in their representatives on the RFMCs or devise a better and earlier means of communication within the departments themselves in determining policy guidelines as they relate to the work of the RFMCs. The situation should improve considerably as top officials in the new national administration complete their staffing changes.

At this juncture one should not be too critical of the developing system for implementing the FCMA. The recent change in federal administration in Washington makes rapid action most difficult until its staffing is complete and enough time has elapsed to allow individual staff members to familiarize themselves with the duties of their offices and their relationships with others in the system. Regional Fishery Management Council members also are new, and many find themselves in the position of having to make judgments based upon arguments by proponents and opponents alike, where previously they were on only one side of an issue with no responsibility for the verdict. As forces of all persuasions work within the system, history is being made. The rewards will be monumental. Let us hope that the forces of reason prevail.

DISCUSSION SESSION

QUESTION: What about proprietary rights in the surf clam fishery? In other words, allow an individual to stake out an area in which he would have exclusive fishing rights?

McHUGH: That is an interesting thought. I am not sure that it has been discussed at all, although I have not attended the meeting of the Scientific and Statistical Committee in the Mid-Atlantic Fishery Management Council (MAFMC). Proprietary rights are simply another

way of providing limitations on effort, I suppose. We have talked at some length about limiting effort in the fishery. To me that is a fairly logical way to solve it.

QUESTION: How can demand for fish products be increased?

ROTHSCHILD: One prerogative of the chairman is to pass the buck. I am not sure that I can say how, except that if a steady supply is produced which, of course, is not very realistic when we think about the variable resources. Then at least the consumer would know that he could go out and buy this particular product at the marketplace and have a reasonably good idea of what he is going to have to pay for it.

QUESTION: Has any element of the fishing industry tried to educate the consumer as to when certain species are most available?

McHUGH: Well ... I know that the National Marine Fisheries Service has tried by certain forms of advertisement and promotion to try and put people on to species that are in good supply.

QUESTION: How does the consumer get involved in any process aimed at adapting to fluctuating supplies?

McHUGH: Let me add something to what I have already said. I think that one of the answers is to be sure that we do not overfish. That is perhaps the best way to get at the problem of fluctuating supply. And in this country, as I am sure you know as well as I do, we have rather specialized tastes for fishery products. If you look at the record of our fisheries, Americans demand a rather small number of generic categories of fish and shellfish. This is one of the reasons why foreign fishing has developed off our coast. I think what we have to do is to try to change the attitudes of the consumers so they will accept a wider variety of fish.

ROTHSCHILD: Let me try a shot at answering that as well. Consumers are interested in two things: having a sufficient quantity of what they want and a reasonable price for it. If the demand for fish is going to increase, it is pretty clear that unless supply increases the quantity that is available on the market will be inadequate and the price will go up. There are a number of things that people can do to counter this. The first thing is to find new sources of raw material. There are exploratory fishing programs or aquaculture programs being discussed. There are ways of managing fish to in-

crease, for example, the yield per recruit and the total yield without doing much more than changing the process of fishing. Secondly, there is the possibility of creating new markets. I pointed out that, in order to do this to benefit the consumer, the markets that would have to be created would be markets for things we do not presently consume. If you enhance the demand of things we don't presently consume, then the price to consumers will probably increase.

In other areas, imports can be developed where appropriate. If demand increases and US fishing is not up to meeting that demand, then imports will fit in and benefit the consumer, keeping the price down. The efficiency with which we use fish probably can be increased to reduce waste, too. Finally, there is decreasing randomness in risk to the fisherman because the more risk and the more randomness there is in what the fisherman does, the more the consumer has to pay. One of the elements involved here is foreign fishing, where both the foreign and the US fishermen compete--except in those cases where these fish enter the US market and contribute to our supply. Another element is the control of fishing effort, which is the whole limited entry problem. The third is the stabilization of regulations. As I pointed out in my presentation, these involve mostly regulations that do not have to do with fishery management--pollution and things like that. That, it seems to me, is a series of things which can be a benefit to the consumer in the sense that they provide a more favorable environment to the fisherman enabling him to produce his product at a lesser price or certainly not an increase in price and keep the quantity up. . . . The healthier the industry the better off is the consumer, provided that the industry is supplying those kinds of fish the consumer wants. What that means is that the industry is aware of the preferences consumers have, and I think that is generally the case.

QUESTION: Is your office or any of the Regional Fishery Management Councils (RFMCs) advocating no growth for domestic fishing?

ROTHSCHILD: I don't know of anyone doing that except in the cases where stock are overexploited, but perhaps some of the other people would care to comment on that.

LOKKEN: The answer is yes. In fisheries where catches are too great now, if stability is to be maintained over a period of time, there must be no growth--that is, in the numbers of vessels. I am not sure this

is what you are directing your question at; however, there are many fisheries in the country which are overexploited now and there can be no growth there. There are others, of course, where there can be considerable growth. The problem is to divert from the fisheries that are overexploited to those that are underexploited. This is the job of the MAFMC.

QUESTION: Is the MAFMC considering a no-growth plan for the Atlantic surf clam fishery?

McHUGH: . . . This is a very important issue for the MAFMC because it strips it of a lot of the strenuous and complicating details that many of the other management plans have. And if I did not say it, I will say it now--if the MAFMC cannot succeed with this one, we had better pack up and figure a better way to try to do it.

ROTHSCHILD: . . . It will be very interesting to see how this clam plan goes because I think it will typify the many other kinds of plans when we remember about 70 percent of the species are caught predominately in the territorial sea even though the surf clam is not. It is outside--but it is mostly domestic. Comments with respect to the data base are interesting. National Marine Fisheries Service, in conjunction with the Department of Commerce, has just put together a lengthy analysis of statistical requirements, particularly responsive to optimum yield and the requirements of the Fishery Conservation and Management Act. Our administrator distributed these to the RFMCs for comments and we are anxious to hear from you regarding your thoughts concerning our efforts in putting together some ideas on data. One comment with respect to data--one of the real difficulties in deciding what is the best management strategy in our commercial fisheries has been the lack of participation by some of the countries that fish off our shore with respect to contributing data. Some countries have been very good, but others have been notably poor. And I think that this has really hampered the North Pacific Fishery Management Council in terms of its ability to come up with good management plans. So, I think we are all hopeful that this will change as a result of the new law.

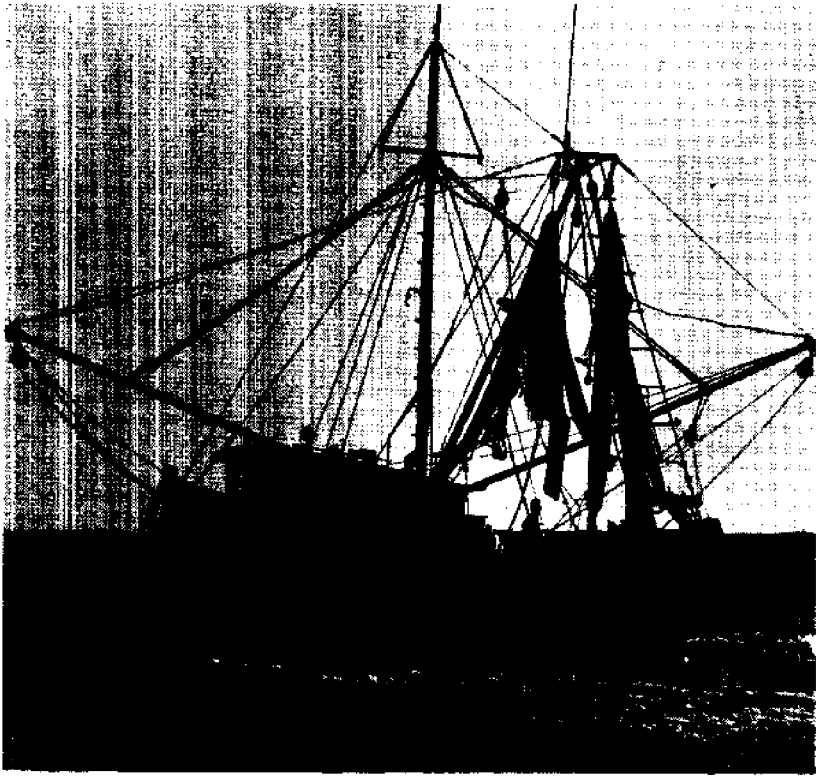
COMMENT: We hope that in this modern day world we can come up with a way to count and weigh marlin from sport tournaments that will not waste marlin. At a recent Dare County tournament, of the 94 marlin caught in one day, 6 were mounted and the rest were disposed of in local landfills.

ROTHSCHILD: I am sure that there are a lot of people who share your view and I would not be surprised if the RFMC in your area will be considering this point. Perhaps there are some other comments on this.

McHUGH: I would like to make a general comment that occurs to me from your remarks. We have two sets of problems in getting fisheries statistics. Fishermen in general are liars. Commercial fishermen tend to lie on the conservative side, and sport fishermen, according to recent studies and general experience, tend to lie on the exaggerated side for various reasons. We have to try to resolve that problem, and it is not going to be easy.

Keynote Address

Congressman Robert L. Leggett



EXTENDED JURISDICTION: PROLOGUE TO A NATIONAL FISHERIES POLICY AND RATIONAL FISHERIES MANAGEMENT

Congressman Robert L. Leggett
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I intend to review very briefly some of the history of United States (US) fisheries laws, highlight our principal aims for the Fishery Conservation and Management Act (FCMA), note some of the more significant results so far, and then indicate where we have yet to go and what some of the problems and remaining needs are. It is my hope that at this conference we will keep (or develop if we do not yet have) a broad view of where we are in US fisheries management and where we want to go. Extended jurisdiction is not an end, but only one part of the means to certain local, regional, national, and international ends. If what has been done to date in furtherance of a national fisheries policy and effective fisheries management were likened to God's creation of the world, we probably have put in one good day. It took Him a week before He was ready to consider his handiwork "good," yet some of us tend to dwell too much in a state of satisfaction over one day's labor rather than channeling our energies to the tasks remaining. Perhaps I can help demolish any complacency among you.

Pre-1976 US Fisheries Laws

Nearly all early US fisheries laws dealt with freshwater and anadromous species, principally through the need to regulate interstate commerce and in support of artificial propagation (hatcheries) for conservation and sport fishing purposes. The rights of the states to manage resident fish and wildlife were largely absolute. There was precious little involvement of the federal government in commercial fisheries affairs prior to 1871, when appointment of a Commissioner of Fish and Fisheries was authorized to study the decrease of food fishes of the seacosts and lakes of the US, and to recommend measures designed to remedy such decrease.

As Knight (1977) noted in his recent book, Managing the Sea's Living Resources, modern US high-seas fisheries policy can be said to have begun with the "second" Truman

Proclamation of 1945 in which the US stated that it considered as proper the establishment of "explicitly bounded" conservation zones in high-seas areas. The Proclamation noted further that, where fishing activities in such conservation zones involved foreign nations, such zones were to be established only pursuant to agreements between the US and the other affected states. This Truman Proclamation was the cornerstone of US high-seas fishing policy until 1976, with perhaps the sole exception of our 1966 action in adopting the 12-mile exclusive fishing zone. Other significant federal actions prior to 1976 include the 1954 Fishermen's Protective Act adopted in response to tuna boat seizures by Latin-American nations; the Bartlett Act making unauthorized foreign fishing within our 12-mile zone a criminal offense; our signature to the Continental Shelf Convention; and the 1973 Offshore Shrimp Fisheries Act with its rider declaring the American lobster as a "sedentary" species, thus subject to US jurisdiction under the Continental Shelf Convention. These various laws and implementing regulations constituted the US response to the needs and interests of various segments of its fishing industry.

The 1976 Act

The 94th Congress saw the culmination of many years of effort to redress the grievances of US domestic fishermen--particularly in New England, the Pacific Northwest, and Alaska--concerning the serious depletion of valuable fisheries and the economic depression associated with it. Since 1960, increasingly heavy foreign fishing efforts beyond the 12-mile limit--compounded by previous and continuing heavy domestic fishing efforts--have resulted in serious depletions of many overfished stocks, some to the point of commercial extinction. Every Congress since the 88th had bills before it aimed at improving US authority and control over the fish resources off her shores and over those fish that spend a significant part of their anadromous and migratory life histories within her streams and coastal waters. The issue heated up to the boiling point in the 94th Congress with the House and Senate both passing the FCMA and the President signing it into law on April 13, 1976.

As part and extension of congressional consideration of the fisheries issues behind this landmark legislation, a number of investigations were ordered including (1) the Eastland Resolution studies by the three interstate Marine Fisheries Commissions; (2) the assessment by the Office of Technology Assessment (OTA) of the technological requirements of fishery management

under extended jurisdiction; and (3) the General Accounting Office (GAO) study to define policy issues, options and costs of revitalizing the US commercial fishing industry. In addition the National Marine Fisheries Service (NMFS) prepared a national plan covering a broad range of fisheries concerns in response to a recommendation by the National Advisory Committee on Oceans and Atmosphere.

There is neither time nor reason to elaborate on each of these studies. My principal point in identifying them was to emphasize that in the past three years this country definitely has entered a radically new era in US fisheries management. The unprecedented attention given to US fisheries needs and opportunities is evidenced in the aforementioned congressional and executive studies, as well as by passage of the legislation itself. We have gone through an intensive period of education in the Congress and in the nation, and that bodes well for the collective interests represented here today.

What was expected with passage of the FCMA? First and foremost was conservation--conservation of important fish resources which were seen to be increasingly threatened by heavy fishing pressure, particularly from foreign fleets. While there were certainly elements of conservation concern rooted in principles of ethical stewardship, it is also safe to say that the conservation consideration came more with a desire to save fish for taking by present and future US fishermen. The other side of the conservation coin was--and is--management. The FCMA seeks to provide a previously missing management apparatus that deals realistically with the physical and biological realities of fisheries stock assessments and manipulations, and with control of fishing pressure. Conservation was to be effected for the benefit of domestic interests, with due consideration for world food needs and global national interests.

Domestically, the FCMA aims to meet the needs of both commercial and sport fishermen. It is important to note that we have all too often failed to realize the necessity of evaluating the recreational take when calculating allowable commercial harvest levels of some fish stocks. For example, a recent survey indicated the recreational catch of bluefish off the Middle Atlantic area is double the commercial catch. Obviously, management has to take such catch statistics into account.

Closer to home at the NMFS Beaufort Laboratory's Atlantic Estuarine Fisheries Center, Dr. Gene Huntsman

(1976) and his colleagues have shown the existence off the Carolina coast of a little known and unappreciated community of tropical deepwater fish typical of Caribbean Banks--groupers, snappers, porgies, and grunt. These species support a recreational headboat fishery operating from North Carolina and South Carolina ports. On the order of a half-million or more fish weighing about 1.5 million pounds have been taken annually in recent years in this recreational fishery (Grimes et al., 1977). Presumably, other examples abound along all our coasts and the Congress intended that these recreational fisheries be studied and managed as an essential part of any management scheme set up under the FCMA.

Results So Far

Some of the results of the FCMA that either have been achieved or are in process are:

1. A new international order favors and widely recognizes the 200-mile fisheries zones. Without getting into a discussion of the pros and cons of Law of the Sea (LOS) negotiations, it nevertheless seems clear that, by and large, this issue has been decided. The FCMA is not responsible for this development, but US action clearly accelerated a process that may well have been inevitable anyway.

2. A new institutional machinery has been created and is being refined for conservation and management of valuable fish resources--machinery that is at least potentially adequate to the tasks--unlike the previously employed apparatus. The assertion of control over the fish and the waters is obviously critical to management, but the mere assertion of control alone does not result in managed fisheries. Accordingly, the FCMA requires preparation of management plans by Regional Fishery Management Councils (RFMCs) on which are represented federal, state, and local commercial and recreational fisheries personnel. The RFMCs--which are nearly autonomous--are totally new entities designed to avoid unnecessary federal control as much as possible; to rise above parochial single-state interests; and to give meaningful voices to knowledgeable, local representatives of industry and other interests most directly affected by the management of the fisheries resources of each RFMC's purview. Most RFMCs have established Scientific and Statistical Committees and Industry Advisory Committees to assist them in their work.

3. Actual management of fish stocks is occurring. The FCMA means that fish stocks will be utilized according to management plans based on the best available scientific data. Foreign fishing fleets can operate in the US 200-mile zone only as permitted, with time, place, gear, and species-take all subject to regulation. The law also provides for regulation of domestic fishermen, including the limiting of entry to a fishery if a majority of a given RFMC approve such a restriction. The Secretary of Commerce can never limit entry for domestic fishermen if an RFMC does not approve it. There is no reason now, given adequate stock assessment data, that stocks in the US zone cannot be managed to recovery and, thereafter, for optimal sustained yield production indefinitely, so long as necessary hard decisions are faced and made. In an interview with National Fisherman, conference rapporteur Spencer Apollonio was quoted as saying: "It's going to be slow, it's going to be painful, it's going to be inefficient, it's going to be expensive, but it is the only technique that exists at this time for managing these fish" (Brooks, 1977, p. 38-A).

4. Better data gathering is now possible for a number of reasons, not least of which is the ability to require certain data from, and to permit on-board inspections of, foreign vessels as a condition of fishing permits. Combined with increased efforts to determine effects of domestic fishing in such areas as by-catch and throw-backs, more accurate assessment can be made of stocks and allowable catches.

5. Economic benefits to domestic fishermen and related enterprises are occurring. According to the NMFS, the 1976 catch by domestic fishermen in the US Fishery Conservation Zone (FCZ) for the 31 species for which preliminary management plans and fishery management plans (FMPs) are in effect for 1977 was 289,000 metric tons. The potential US catching capacity for those same species in 1978 is estimated to be 654,000 metric tons. The projected foreign catch regulated by management plans in the FCZ for those same 31 species plus Atlantic mackerel in 1977 is 2.098 million metric tons, which represents a decrease of 400,500 metric tons from the actual catch in 1975. An additional decrease of 93,800 metric tons in allowable foreign catch is projected for 1978, meaning that additional tonnage will be available for US fishermen. The National Marine Fisheries Service estimates that by 1978 catches in regulated fisheries (where there is both US and foreign activity) may be up 26 percent for US fishermen; catches by foreign vessels will drop about 20 percent. In fact the drop could be con-

siderably more if the present trend continues; since 1976, the foreign catch within 200 miles of our shores declined from approximately 3 million metric tons to 2 million metric tons--a decline of more than 30 percent. The National Marine Fisheries Service cautions, however, that "whether the expected increases will materialize [for US fishermen] depends upon improvement in the condition of fisheries stocks and industry's willingness to diversify to species that previously have not been sought by US fishermen" (National Oceanic and Atmospheric Administration, 1977).

A veritable spurt in activity has occurred at US shipyards in anticipation of gains in US catches resulting from the FCMA. Reportedly, at least 40 new fishing vessels are under construction in New England, 400 in the South Atlantic and Gulf states, and 23 on the west coast. While much of this activity constitutes normal replacement of obsolete or worn vessels, or construction for foreign fleets, a significant amount of the activity is indicative of an improved investment climate and general optimism about US fisheries.

This is but a superficial sampling of evidence indicating that the FCMA is having some of its intended effects. Conference speakers are providing considerably more detail about many of the points touched on here. Let us turn now to an examination of some things that still lie ahead--the unfinished agenda.

Problems and Remaining Needs

The purpose of the FCMA is creation--or restoration, if you will--of a healthy, viable, aggressive, competitive, and valuable US fishing industry in the broadest sense. The FCMA is not merely a response to certain acute needs of a status quo fishing industry. The US needs a more modern and productive fisheries apparatus to deal with everything associated with this country's aquatic protein production, from basic research to handling, processing, marketing, and consumption. The biological resources of our seas and estuaries are finite but, under better management, they are capable of producing far more than they ever have to the benefit of the industry, the economy, the people, and the world.

Such studies as the Eastland Resolution surveys, the OTA and GAO investigations, the Congressional Research Service review of aquaculture, and the present National Academy of Sciences assessment of US aquacul-

ture potential are all part of my (and I believe many of my colleagues') intention to develop as complete and sophisticated an understanding as possible of US fishing industry needs and potentials as we continue on the road to these goals. Some of the areas where we have our work cut out for us are:

1. National policy. We continue to pursue the development of a meaningful and effective national oceans policy and the completion of a national policy toward fisheries--both of which have been grossly inadequate to date. Richard A. Frank, the new administrator of the National Oceanic and Atmospheric Administration (NOAA), seemingly is committed to producing such policies within NOAA and to assisting the Secretary of Commerce in such pursuits for the overall administration. President James E. Carter's reorganization team and the Office of Management and Budget are said to be close to fundamental decisions about natural resources management in general, and oceans are part of that decision complex. Whether we move toward a Department of Oceans, Atmosphere, and Energy; a Department of Natural Resources; an independent oceans agency or an independent NOAA; or a Department of Commerce, Oceans, and Atmosphere; or some as yet unforeseen hybrid, we hope to see some long-overdue reorganization of the executive branch so that neglected ocean and fisheries policy issues can be addressed as they merit being addressed--in an integrated and adequate fashion. Obviously, a situation where the administration imposes manpower ceilings in the principal fisheries agency makes no sense whatsoever at the very time we are trying to "beef up" US fisheries research, management, and enforcement capabilities. I am hopeful when these reorganization decisions are made, we will see allocation of sufficient funds and manpower to the fisheries programs so the work can be accomplished. Any investments made in this area will pay for themselves several times over in contributions to the US economy, to jobs, and to our culture.

2. Joint ventures. There has been a good deal of discussion of, interest in, and even some offers by foreign fishing interests to establish joint economic ventures with domestic firms in order to gain access to some of our newly protected fish resources. The NMFS has been conducting a series of meetings in coastal states to sample public opinion on requests by foreign fishing and processing vessels to enter into such arrangements. Public reaction has ranged from condemnation to conditional support, but rarely outright approval. Most of the requests received by the Secretary of Commerce to date involve Pacific fisheries, but such Atlantic fisheries as squid have received some attention. At some point, the

various RFMCs and the Secretary of Commerce will need to determine a position regarding these ventures, in terms of both management of various stocks and of economic advantage to the US and to certain fishing sectors in the US. The Subcommittee on Fisheries and Wildlife Conservation and the Environment has held one day of hearings on this issue and additional hearings will be held as soon as the NMFS has had sufficient opportunity to digest the testimony produced at its hearings and has formulated a position.

3. International relations and governing international fisheries agreements (GIFAs). In addition to necessary adjustments in existing GIFAs, there remain a number of important and unresolved issues with Canada over our respectively claimed fisheries zones. Not only does Canada assert claim to a 12-mile territorial sea (while we remain committed to the internationally recognized three-mile sea, until the issue is resolved at the LOS Conference), but US maritime boundaries are still in dispute at four locations: the Gulf of Maine; the Strait of Juan de Fuca, between the State of Washington and British Columbia; Dixon Entrance, between British Columbia and Alaska; and the Arctic slope. The Gulf of Maine is clearly the most controversial of these disputes. While Congress thought it was enacting "once only" legislation in adopting the Reciprocal Fisheries Agreement with Canada to buy more time to negotiate a GIFA with her, it now seems entirely possible a new Reciprocal Agreement may have to be negotiated while the boundary disputes continue to hold up a possible GIFA.

Along these lines, the relationship between the RFMC and the Secretary of State will bear close scrutiny. While the FCMA recognizes the necessary and proper role of the State Department in any questions which concern US foreign policy, it nevertheless makes clear congressional intent that US fisheries interests be accorded serious weight in our relations with other powers. There is need for evidence that the people in the State Department appreciate this congressional intent and that they place high value on the views of US fishing interests and the RFMCs.

A continuing problem, also involving the State Department, concerns enforcement of the FCMA against foreign vessels operating in violation of the law or their particular permit. Clearly, the Congress intended, and the FCMA provides, that enforcement be carried out by the Coast Guard with input from the NMFS and the Justice Department. Unfortunately, since the 200-mile zone went into effect last March, there has been continuing intervention in the process by the State Department on the

basis of vague foreign policy and national security considerations. All of us recognize that there may be unique occasions where such considerations will be of such import as to override all others. But such incidents should be rare indeed, and I can assure you that our committee intends to insist on full disclosure of the basis for each such act of State Department interference in order to prevent enforcement of the FCMA from being thwarted merely to make life more serene for our diplomats.

4. Democracy vs. technocracy. There have already been and there will increasingly be problems and debate, if not conflict, over the necessity to manage US fishermen as well as fish if the fisheries are to be managed wisely and well. There were numerous instances of overfishing before foreign fleets became a problem, and there will be no gain if one capacity for overfishing is merely replaced by another. At the same time, US fishing involves cultural and other social values of high importance and we cannot be governed by efficiency criteria alone. But as limiting entry or otherwise restricting the fishing activities of US fishermen in certain fisheries becomes necessary, if the fish resource is to be protected and if a decent return on investment and effort for some fishermen is to be assured, certain hard decisions and painful transitions must inevitably be experienced. The FCMA properly (I think) places the responsibility for these decisions at the level of the RFMCs. Within the total management apparatus, they alone will be close enough to local interests to best evolve solutions which are least heavy-handed and most effective over the long run. It is important that these RFMCs not shirk their responsibilities in facing up to fishery management problems, but it is equally important that they remember this is a democracy, not a technocracy, and that US fisheries management cannot be based on economics alone.

5. Marketing and product identity. If per capita consumption of fish and fish products by US consumers is to be increased and if pressure on some traditionally overfished stocks is to be relieved and new fisheries of significant potential are to be developed, then more must be done to assure the consumer of attractive and wholesome fish products. And more must be done to market new products and new species effectively. Regular fish inspection, grading to publicly understood standards, use of a consistent marketing terminology, and more aggressive consumer education campaigns all may be necessary and may be highly cost-effective in expanding the benefits of fisheries wealth.

6. Pollution of freshwater, estuarine, and marine ecosystems. Fish that are healthy and healthful cannot be produced in polluted waters. The Mid-Atlantic Fishery Management Council (MAFMC), for example, has attached to its revised surf clam and ocean quahog fisheries plan a strongly worded amendment expressing "deep concern" over pollution, particularly from ocean dumping of sewage sludge, dredge spoil, and chemical wastes; from discharge of raw sewage in the Hudson River, and from discharge of primary-treated sewage from ocean outfalls, which are all impacting negatively on surf clam and quahog. The MAFMC's amendment notes: "The extremely substantial quantity of pollutants which are being introduced into the Atlantic Ocean poses a threat to the continued existence of a viable fishery" (Mid-Atlantic Council, 1977, p. 15-A). This is but one example of an increasingly serious problem that must be resolved if a number of objectives of the FCMA are to be realized.

7. Aquaculture. In addressing US fisheries needs and opportunities, aquaculture is one of the subjects in which I have recently become most involved.

Currently, US aquaculture is responsible for such selected species as catfish, 48 million pounds; clam (meats), 2.6 million pounds; crayfish, 10 million pounds; freshwater prawn, 17,000 pounds; oyster (meats), 20 million pounds; salmon (pen culture), 1 million pounds; salmon (hatchery-released), 60 million pounds; shrimp, 800,000 pounds; and trout, 30 million pounds.

While aquaculture is about a $200 million industry, it accounts for only 3 percent of all fish and shellfish consumed domestically. However, its potential in the US is enormous. Per capita US consumption of fish and shellfish is around 12 pounds yearly, and is projected to increase to more than 15 pounds by the year 2000. This compares to the world per capita consumption of about 24 pounds yearly, ranging from less than 1 pound in Afghanistan to over 79 pounds in Japan and Iceland.

I have been encouraged by the progress aquaculture is making throughout the world. I have personally seen and examined freshwater and marine aquaculture programs in Japan involving such species as yellowtail, red sea bream, shrimp, oyster, scallop, and seaweed. Japan recently has embarked on a $667 million coastal fisheries expansion program of which more than $333 million will be allocated to aquaculture.

In Hawaii I have examined farming programs involving such species as freshwater prawn, mullet, milkfish,

shrimp, moi, baitfish, oyster, and clam. The State of Hawaii itself recently launched an expanded aquaculture program, committing over $5 million to the program this year.

I have visited Marifarms, Inc., Panama City, Florida, and observed shrimp being grown in controlled conditions. I have visited a number of facilities on the west coast observing programs involving such species as salmon, trout, and oyster. In my most recent trip I visited a number of salmon facilities in Alaska, and the State of Alaska has just recently embarked on a $500 million fisheries program of which over $250 million has been allocated to the building of salmon fish hatcheries alone.

Canada recently committed herself to a $400 million fisheries program aimed at the restoration of British Columbia salmon stocks. And Mexico recently launched a more than $1 billion fisheries program, of which more than $200 million is to be committed to aquaculture activities.

Naturally, I have become extremely encouraged by these activities and commitments, and I am firmly convinced that here in the US we have a strong potential for producing high-quality, nutritious seafood products for consumption at home as well as abroad to the benefit of our economy and hungry people alike.

I am pleased to report that legislation I have introduced to promote the commercial development of aquaculture in the US was ordered reported by our Merchant Marine and Fisheries Committee on September 29. We are hopeful that the bill can be brought before the full House for a vote before the end of this session of the Congress.

The legislation would make a strong commitment on the part of the US calling for a $500 million guarantee loan program, a $250 million disaster loan program, and an all-risk insurance program authorizing total face value coverage up to $1 billion.

8. Finally, there is a problem waiting to develop off our South Atlantic coast. I refer to the occasional netting of sea turtles in shrimp and other fishing nets. As these turtles have been placed on the Threatened Species list, even inadvertant taking of them can lead to problems so reminiscent of the conflict between tuna fishing and porpoise protection that I shudder to think of the controversy that could erupt. I would like to urge the South Atlantic Fishery Management Council to

address this situation now, before it becomes a major problem, to determine if changes in fishing techniques or gear will be required as part of certain fishery management plans.

In summary, we have come a long way in US fisheries, but we have a long way yet to go. I think this conference can help us to gain perspective on the enterprise in which we are engaged, and to realize we are all part of something quite big and quite important to the American people and to the world at large. Policies and institutional machinery are not created overnight. There remains a good deal of adjustment to be made in the existing structure, and there is a great need for new ideas and fresh initiatives to meet the challenges of the future.

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Panel Presentation: Domestic Outlook for Implementing Fishery Management

Session Chairman: David A. Adams

A FISHERMAN'S VIEW OF EXTENDED JURISDICTION

George J. Easley
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I would like to make a few comments about Public Law 94-265, the Fishery Conservation and Management Act (FCMA), or the so-called 200-mile bill--where it looks like we have gone so far, and where I hope we will go in the future. First let me say that I believe the heart of this bill is Sec. 301, the National Standards for Conservation and Management. The first standard brings up the term "optimum yield" (OY). Under definitions in the FCMA, and I quote, "the term 'optimum,' with respect to the yield from a fishery, means the amount of fish: (A) which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational opportunities; and (B) which is prescribed as such on the basis of the maximum sustainable yield from such a fishery, as modified by any relevant economic, social or ecological factor."

After a national workshop on the term "optimum yield"--what is it and how do you find it? The Pacific Fishery Management Council's (PFMC) representative returned with the definition that is in the FCMA or, to put it more simply, it is now necessary for fishery managers to take people into consideration as well as the fish. There is much we do not know about the ecosystem. The economics also has some very large holes as it concerns fisheries. But when it comes to the social valuation, there is almost nothing. It is going to be very difficult to come up with "optimum yield" at the present time and, when we do so for one set of conditions, we can count on the conditions changing as soon as if not before we are done.

The FCMA passed not because fishermen wanted to be managed; they did not. It passed because of the failure of bilateral and multilateral negotiations to maintain and/or enhance the various stocks of fish. So, like all good things that come to pass, the fisherman got more than he wanted.

On the plus side for the PFMC, which I am on, there has been a marked increase in dialogue and sharing of problems between federal and state managers and the fishermen themselves. Sometimes it appears to me that of the people talking to fishermen the people in the academic

world miss a point the farthest, when one is missed. It is encouraging to see this increase in dialogue, and sharing of problems, as it can bring about good in the long haul. I feel that the regional approach is a good one. As fish do not know about state boundaries, in time we may come up with rules and regulations that are more uniform from one state to the next. The transboundary stocks are going to be a problem that will be around for a long time, as negotiations will be long and difficult to conclude. It is vital that the Regional Fishery Management Councils (RFMCs) be a part of these negotiations from the start. In the case of the PFMC, if it were decided by the State Department, Commerce, and another country how transboundary stocks were to be managed without the Council, the Council would have nothing to do. To keep things in perspective, the National Marine Fisheries Service, northwest and southwest regions; the Seattle office of the National Oceanic and Atmospheric Administration; the states--all have given freely of their time and support in getting the PFMC on its way, and are continuing to do so. The PFMC would not have gotten off to the start that it did without this time and support.

One of the first things we did was to establish some of the fisheries that would need management plans, and establish priorities on which would get attention first. The winners in this sweepstakes were the salmon and anchovy fisheries. These fisheries have some things in common--both are transboundary stocks, one with Canada and one with Mexico; both are very emotional issues which are almost impossible to talk facts about to a large part of the user groups. We ended up trying to write a plan for the ocean fishery of salmon instead of one that covered the full range of the salmon. The salmon resource is used by six groups and also is intercepted by the Canadians. The six groups are the trollers, charter boats, sport fishermen, Indians, gillnetters, and seiners. The first four fish in the ocean; the last two are terminal fisheries. The Indians are to be given 50 percent of the salmon as per two federal court rulings. The fact is, we do not have enough salmon for everybody fishing them. It was my opinion that if we did the job that should be done, everyone who fishes salmon would be mad at the PFMC; using that for a yardstick, we failed. The only ones mad at us are the trollers. I am hopeful that we will get a better balance with the comprehensive plan that is in the works at present. The anchovy plan is being approached in a much more deliberate manner, although there will no doubt be some dissent when the plan is completed.

Now, back to the salmon. There are some users who are not called users, but nevertheless they have had more effect on the resource than fishing over the past 30 or 40 years. Let me list these users for you: hydroelectric power or dams, agriculture, logging, mining, and dredging. This group of users has caused great changes in the spawning habitat of the salmon. A large portion of the salmon spawning ground is gone and never will be replaced. There has been a large hatchery program which has averted a complete disaster for many runs. But some runs have been wiped out completely. In the longer rivers the headwaters have been closed off to the salmon. We all have benefited to some degree from the development of all the other resources at the expense of the salmon. The big clinker in any conservation effort is that almost anything done to conserve salmon in the ocean, in hopes of getting it back to the spawning grounds, will transfer more fish to the Canadian fishery. The State Department is working on a salmon interception treaty. When we can expect results of those talks I could not say. You now have a brief outline of the problems associated with salmon in the Northwest.

It is apparent that the PFMC alone cannot solve all of the problems that are part of the salmon resource. We can list the problems that are connected with salmon, with the help of the people involved in the many areas, both directly and indirectly. When we have listed all the problems, we can then list steps to solve them--expected cost and expected benefit, both to the resource and to man. With this information in hand it can be decided on a rational basis what we as a society want to do. There is one area that I have not yet mentioned, and that is aquaculture--in this case, ocean ranching--where you turn young fish out into the ocean and hope for a return large enough to make a profit. I expect these people to use and be on the leading edge of technology concerning salmon. The permits issued by Oregon leave the fish in the public domain until they return to their release site. This will provide fish for the sport and commercial fisherman to catch, as well as for the ocean rancher.

The point I have been trying to make is that if we are going to find any answers that will stand up and be supported by the users--both direct and indirect users--we have to have the widest possible participation from those who will be directly involved and to a lesser degree from those who will be indirectly involved. I realize that this is difficult to do, but there are some different approaches being made in the RFMCs. Maybe we will come up with something that will work. Participation on

the part of the managers is just as important as it is on the part of the managed. You who are involved in the management get out and see what is going on, talk to and spend time with those you are trying to manage. A small investment in time would pay us all great dividends.

Now looking to the future, I would like to say that I think the Regional Fishery Management Councils will work as management regimes for fisheries resources for a long time to come. I never did think this concept would solve all of our problems. What we now need is an economic climate in which we can compete on a heads-up basis with the rest of the world. If we are to develop our undeveloped fisheries, something has to be done to counteract the subsidies that are the rule in the rest of the world. I believe that the United States (US) fisherman can compete with anybody, all things being even. By all things being even I do not mean subsidies, I mean enforcement of present laws concerning foreign subsidies or enactment of new laws to correct the problems, but by no means do I mean subsidies for US fishermen. I do not want them, and the majority of fishermen I talk to do not want them. Another approach might be to establish a quota which would put a lid on the fish that can be imported into the US so that the domestic fisherman will have a market to start on. In this manner the buildup of plant and fleet could be accomplished over a period of time without depriving the consumer of product, or disrupting the economies of other nations.

MARINE RECREATIONAL FISHERIES UNDER EXTENDED FISHERIES JURISDICTION

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Public Law 94-265, the Fishery Conservation and Management Act (FCMA) of 1976, has among its several avowed congressional purposes (emphasis added) "to promote domestic commercial and recreational fishing under sound conservation and management principles" [Sec. 2(b)(3)], and "to provide for the preparation and implementation, in accordance with National Standards, of fishery management plans which will achieve and maintain, on a continuous basis, the optimum yield from each fishery" [Sec. 2(b)(4)]. As a mechanism to achieve this and related

objectives, the FCMA provides for the establishment of Regional Fishery Management Councils (RFMCs) [Sec. 2(b)(5)].

The Congress further declared it to be its policy, among other matters in the FCMA, "to assure that the national fishery conservation and management program utilizes, and is based upon, the best scientific information available" [Sec. 2(c)(3)]. The FCMA states, moreover (emphasis added), that:

> The term conservation and management refers to all the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining any fishery resource and the marine environment; and (B) which are designed to assure that
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> (i) a supply of food and other products may be taken, and that recreational benefits may be obtained, on a continuing basis;
>
> (ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and
>
> (iii) there will be a multiplicity of options available with respect to future uses of these resources [Sec. 3(2)].

The FCMA declares (emphasis added) that "the term optimum, with respect to the yield from a fishery, means the amount of fish--(A) which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational opportunities; and (B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor" [Sec. 3(18)].

The FCMA also declares that (emphasis added) "the term 'fishing vessel' means any vessel, boat, ship, or other craft which is used for, equipped to be used for, or of a type which is normally used for--(A) fishing; or (B) aiding or assisting" [Sec. 3(11)]. It further declares (emphasis added) that "the term 'vessel of the United States' means any vessel documented under the laws of the United States or registered under the laws of any state" [Sec. 3(25)]--thereby embracing 1.01 million sport fishing craft registered in the 25 coastal states (Ridgely, 1975).

Given the foregoing guideposts it should be abundantly clear that Congress has mandated that the marine

recreational fisheries (MRF) must be taken into account from the outset and fully accommodated in the development of any and all plans formulated for the management of the fishery resources occurring within the 200-mile United States (US) Fishery Conservation Zone (FCZ).

The "best scientific information available" indicates (by extrapolation from 1955 to 1970 data) that some 12 million or more habitual anglers fished recreationally in 1975 within the FCZ, while investing more than 145 million man-days in this form of healthful outdoor recreation (Anon., 1972). They harvested about 2.02 billion pounds (916,000 metric tons) of edible finfish in the process (Deuel, 1973).

That these numbers are conservative, if anything, is evident from a recently released study of MRF participation in the southeastern US during 1974. A total of approximately 7.2 million MRF finfishing participants were estimated in the eight-state area from North Carolina through Texas, alone. Additionally, it was estimated that there were almost 4.1 million recreational shellfish fishermen (Mabrey et al., 1977).

A recently completed study entitled Economic Activity Associated with Marine Recreational Fishing (Fain et al., 1977) brought forward a number of "relevant economic [and] social . . . factor[s]" that bear on the modification of maximum sustainable yield (MSY), as required by the FCMA [Sec. (3)(18)] in order to prescribe the optimum yield (OY) from fisheries that are subject to recreational use. The study found that retail sales of goods and services required by participants in the MRF totaled over $1.8 billion in 1975 and generated $699 million in direct value added to the economy, while utilizing 50,580 person-years of labor and management requiring payoff of more than $343 million in wages and salaries. Nearly $53 million were expended in capital investments by the manufacturing and service entities involved. An estimated 16 percent of the foregoing directly impacted the South Atlantic region in which we are meeting.

In addition to the previously cited national direct economic impacts, a number of economic multiplier effects associated with MRF were approximated as follows in Fain's economic study. In 1975, in addition to the $699 million of value added in the directly impacted businesses, MRF had an associated $1.77 million of direct and indirect value added, and $3.96 million of direct, indirect, and induced value added--the total economic impact. Total direct plus indirect employee compensation and property type income was approximately $1.58 million, and total

direct plus indirect plus induced employee compensation and property type income in the economy as a whole was an estimated $3.53 million. Beyond the estimated total 1975 direct employment of 50,580, the total direct plus indirect employment was estimated at 123,300; the total direct plus indirect plus induced employment was estimated at 241,600.

The foregoing results do not include impacts due to capital spending. In 1975 capital investment associated with marine recreational fishing in the directly impacted sectors generated an additional $46 million of direct plus indirect and $102 million of direct plus indirect plus induced employee compensation and property type income. These investment purchases also generated an additional $49 million of direct plus indirect and $110 million of direct plus indirect plus induced value added. Additional direct plus indirect employment generated by this capital investment amounted to an estimated 2,400 person-years. Additional direct plus indirect plus induced employment related to this spending amounted to an estimated 5,800 person-years.

With respect to foreign fishing within the FCZ, the FCMA provides that "the total allowable level of foreign fishing, if any, with respect to any fishery subject to the exclusive fishery management authority of the US, shall be that portion of the optimum yield of such fishery which will not be harvested by vessels of the US, as determined in accordance with the provisions of that Act" [Sec. 201(d)].

With respect to preparation of fishery management plans, and any implementing regulations, the FCMA requires consistency with a prescribed set of National Standards for fishery conservation and management [Sec. 301(a)], viz:

> (1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.
>
> (2) Conservation and management measures shall be based upon the best scientific information available.
>
> (3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.
>
> (4) Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States

fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Each fishery management plan is required to include, with respect to the fishery involved [Sec. 303(a)]: (1) necessary management measures governing foreign and domestic fishing, which must be consistent with the National Standards and other applicable law; (2) a complete description of the fishery, including gear, species, location, management costs, revenue, recreational interests, and existing foreign and Indian harvesting rights; (3) an assessment and specification of the fishery's present condition, probable future condition, MSY, and OY, and an assessment and specification of the capacity and desire of the US fishing fleet to harvest this OY and the portion of this OY which will not be so harvested and can be made available to foreign fleets; and (4) specification of pertinent statistics which must be submitted to the Secretary [of Commerce] on fishing effort, gear, species taken, and locations of activity.

In addition, the RFMCs have a wide range of discretionary authority under the FCMA [Sec. 303(b)] to include regulations governing permits, catch limitations by various criteria, gear, etc. The RFMCs can even create systems limiting entry into fisheries.

Finally, it seems especially significant that the FCMA directs the Secretary of Commerce to initiate and maintain a program of fisheries research. This new research effort is required to include (emphasis added) "biological research concerning the interdependence of fisheries or stocks of fish, the impact of pollution on fish, the impact of wetland and estuarine degradation, and other matters bearing upon the abundance and availability of fish" [Sec. 304(e)].

From the foregoing, it is obvious (1) that the recreational fisheries are supposed to receive equal consideration with the commercial fisheries under the provisions of the FCMA, and (2) that the broad public interest demands it. The big question is whether, in fact, the recreational fisheries are being accorded appropriate attention in both the deliberations of the RFMCs and the research and other service programs of the National Marine Fisheries Service (NMFS) pursuant to their related responsibilities.

In an effort to assess this broad question, the writer developed a questionnaire in collaboration with Frank C. Carlton and Christopher Weld, President and Executive Vice-President, respectively, of the National Coalition for Marine Conservation (Savannah, Georgia) and distributed it to several segments of the MRF public totaling 111, viz: (1) 25 designated state officials, members of the RFMCs, presumed to be equally sensitive to both MRF and commercial fisheries (CF) issues and needs; (2) 18 incumbent members of the RFMCs indentified by the NMFS as representing MRF interests; (3) 16 known active candidates for nomination to recent vacancies on the RFMCs created by expiration of initial one-year-term appointments, or other than one-year-term incumbents, presumed to be especially knowledgeable in MRF matters; (4) 28 selected other MRF leadership elements in national angling associations, conservation organizations, and coordinating groups; and (5) 24 selected outdoor writers of prominent major daily newspapers in coastal states, presumed to be especially knowledgeable in MRF matters.

Response rate was low overall, totaling only 21 out of 111 (19 percent)--eight from designated state officials; eight from incumbent MRF RFMC members; three from among nonincumbent candidates for RFMC membership (plus two mere acknowledgments); and two from among selected other MRF leadership elements. No responses were forthcoming from any of the selected outdoor writers. For purposes of analysis, responses from groups (3) and (4) were combined into an overall category of "MRF leadership elements."

Overall, the responses indicated that our attempt to evaluate the impact of extended fisheries jurisdiction on MRF was premature in many respects. Repeated comments to various questions were to the effect that insufficient time had elapsed to permit knowledgeable assessment from experience of the particular consideration involved, or even to have raised it as an issue. This circumstance can, in fact, logically account for the poor overall

response to the questionnaire. Reluctance of individuals to disclose their thinking also may have been a contributing factor.

At least one other interpretation remains possible, which is at best disquieting. It is that apart from designated state officials and incumbent MRF members of the RFMCs, few others within the broad MRF leadership spectrum have invested the time and effort needed to become truly knowledgeable of the issues--whether they be anglers, outdoor journalists, or conservationists. It would seem most urgent, therefore, that the MRF interests should take appropriate steps in the near future to correct that unfavorable circumstance within the ranks of their leadership elements.

The questionnaire, formulated jointly by the Sport Fishing Institute and the National Coalition for Marine Conservation, attempted to address some of the issues that are pertinent to any assessment of the effectiveness of the FCMA with respect to MRF management. In the presentation of the survey results that follows, responses to the questions are designated by respondent group; i.e., Group 1 = designated state officials; Group 2 = MRF RFMC members; Group 3 = other MRF leadership.

The questions asked, together with consensus statements of the limited responses received for each question, are as follows:

1. What is your opinion of the general levels of awareness within your RFMC of MRF issues?

> Generally, fairly high, but varied widely with RFMC. Where considered low, appeared to result from an imbalance in RFMC membership that is heavily biased toward CF interests.

a. Are other members of the RFMC aware that FCMA requires that MRF considerations must be taken into account in determining OY?

> Group 1: Yes (one exception).
>
> Group 2: Yes, for the most part.
>
> Group 3: Yes and no--sometimes submerged by CF domination.

b. Are other members of the RFMC willing to give fair and reasonable weight to MRF considerations in arriving at OY?

Group 1: Yes (one RFMC as yet untested).

Group 2: Yes--some exceptions.

Group 3: Yes--until it conflicts with CF objectives.

c. Are the objectives of each management plan fully discussed and prioritized prior to the preparation of the plan? If so, are MRF considerations incorporated in such objectives in a manner which reflects the degree of MRF interest in the particular fisheries?

Group 1: Yes--generally too early to determine.

Group 2: Yes--when not in conflict with CF interests.

Group 3: More or less--insufficient plan development as yet to permit judgment.

2. What is your opinion of the qualifications of the members of your RFMC?

Most members, if not all, meet the broad requirements stated in the FCMA.

a. Does each member of your RFMC possess a general knowledge of the region's fisheries of sufficient breadth to enable him to constructively participate in the RFMC's deliberations concerning most fisheries?

Group 1: Few members have comprehensive knowledge, most being fairly parochial with respect to their particular interests.

Group 2: CF interests are better versed in their area than are MRF interests in theirs. Neither group broadly informed.

Group 3: More or less--probably as good as could be expected.

b. Does each member of your RFMC adequately and effectively represent a particular fishery interest (boat owners, processors, academia, or whatever)?

Group 1: For the most part (two exceptions)--some narrow-mindedness evident concerning MRF issues.

Group 2: Except that MRF representation is disproportionally low, the various fisheries interests are effectively represented.

Group 3: MRF interests inadequately represented, due to excessive proportion of CF representation.

c. So far as you can tell, is each member of your RFMC open-minded with respect to MRF issues?

Group 1: For the most part--exceptions taken with respect to two RFMCs.

Group 2: For the most part--but insufficient experience often noted to make appropriate judgment with respect to plan development.

Group 3: "More or less" (1), or "definitely not" (2).

3. What is your opinion concerning the makeup of your RFMC?

A majority of respondents expressed various reservations about certain imbalances they perceive.

a. Is your RFMC reasonably balanced in terms of the representation of the various factions within the region's fisheries and, specifically, is MRF represented in proportion to the recreational fisheries interests within the region?

Group 1: Several RFMCs have excessive representation of CF interests at expense of MRF interests.

Group 2: Several RFMCs are underrepresentative of MRF interests vs. CF interests.

Group 3: Several RFMCs are dominated by CF representation relative to proper balance with MRF representation.

b. Are MRF interests effectively represented on the Advisory Committee and Scientific and Statistical Committee appointed by your RFMC?

Group 1: Fairly so on Advisory, but less so on S&S Committees.

Group 2: Substantially, yes; better on Advisory than on S&S Committees.

Group 3: Effective, such as prevails, but inadequate.

c. Are your own requests fulfilled when you ask for information concerning an MRF issue?

Group 1: Conditioned only by a general lack of definitive MRF data.

Group 2: To extent available--limited by the paucity of hard data generally available on MRF-related matters.

Group 3: Negative indication from all respondents in this group.

4. What is your opinion concerning the manner in which your RFMC has discharged its duties mandated by FCMA with respect to MRF?

a. Has your RFMC assembled a list of fisheries requiring management? If so, have the fisheries of particular interest to recreational fishermen been given adequate priority?

Group 1: Yes to both--the highest priorities assigned to troubled CF.

Group 2: Same--some important species not yet listed.

Group 3: Same.

b. Are there any fisheries within your region which are exclusively recreational fisheries?

Group 1: A few--billfishes, steelhead trout, kelp bass, sand bass, striped bass in California.

Group 2: A few--marlin, sailfish, mackerel (mostly).

Group 3: A few--marlin, kelp bass.

c. Specifically, what MRF issues have been dealt with by your RFMC? What issues have been recognized by your RFMC but shelved, avoided, or otherwise not dealt with?

Group 1: Long-lining in the FCZ; allocation of codfish between CF and MRF uses; MRF issues in general, in one RFMC.

Group 2: Relationship of coastal zone management with the FCMA; state-federal relationships concerning interzonal species such as striped bass and bluefish.

Group 3: Salmon; quota allocations; long-line fisheries; pelagic game fishes.

5. To what extent are the state fisheries agencies in your region cooperating with your RFMC?

Generally high degree of state-RFMC cooperation is evident in all regions.

a. To what extent are the states developing and making available fisheries data to your RFMC? In particular, are the states in your region developing any catch/effort data with respect to MRF?

Group 1: All available data, though limited, are made available. Some localized studies are underway. See the need and would do more if NMFS would provide needed funds.

Group 2: Limited existing data are made available, but no state effort is underway to collect more, lacking new funding from NMFS for that purpose.

Group 3: Data are supplied to the extent available. No major efforts underway to develop more except by California.

b. Is any effort being made to develop a method of counting MRF fishermen and analyzing their activities in the states of your region?

Group 1: Aware only of some limited work being undertaken in this area of need by the NMFS.

Group 2: Unaware of any such effort, as yet, but is a high-priority need identified by RFMCs.

Group 3: Little or none, far as is known.

c. Is there any discernible trend in the sentiment for or against a recreational fishing license in your state, your region, or among the representatives on your RFMC?

Group 1: Views generally offset one another, reflecting opposition in some areas, acceptance in others.

Group 2: There is strong majority support within RFMCs. Public opposition is recognized, but strong agreement exists that opposition is declining.

Group 3: Among anglers, themselves, there is definite trend toward acceptance, though much opposition remains.

6. How does your RFMC approach the management of fisheries involving two or more user groups?

Parochially in some RFMCs; thoughtfully in others.

a. Has your RFMC dealt with fisheries involving a commercial/recreational competition or competition between users of different types of fishing gear?

Group 1: Japanese long-lining vs. billfish; codfish allocations; otherwise, not as yet.

Group 2: Salmon troll fishery; codfish allocations; otherwise, not as yet.

Group 3: Salmon.

b. In your opinion, would your RFMC, as presently composed, be able to achieve a fair and reasonable balance between user groups where two or more are involved?

Group 1: Generally--with minor reservations.

Group 2: Generally--some reservation in RFMCs where MRF interests are overbalanced by CF interests.

Group 3: Questionable, at best, where MRF interests are in competition with CF interests.

c. How do you feel your RFMC has dealt (or will deal) with the problem of rebuilding an overfished stock? What is the general level of concern for conservation and ecological relationships?

Group 1: No effort yet to rebuild overfished stocks; however, concern very great for long-range conservation and attention to ecological relationships.

Group 2: Much concern about the many overfished stocks, looking to their rebuilding in long-range; short-term regulations have failed to move in this direction.

Group 3: Conservation seems to be of lower priority than the politics of harvest; nevertheless, there is evident concern over the long-term problem.

7. What do you perceive to be the major problem of the state-federal relationship in fisheries management under the FCMA?

Project funding on a short-term rather than long-range continuing basis.

a. To what extent has your RFMC tried to deal with the problem of managing stocks that are fished for both inside and outside the three-mile limit?

Group 1: Track record insufficient for judgment, but expect states to be compatible with RFMCs.

Group 2: Generally not come to grips with issue, apart from some effort with respect to herring.

Group 3: No measurable progress evident in this area.

b. Has any attempt been made by your RFMC to define its prerogatives with respect to the management of fisheries which take place in part within the three-mile limit?

Group 1: Generally not an issue, up to the present.

Group 2: Issue is generally avoided, or has not yet come up.

Group 3: Issue has been largely avoided thus far.

c. What has been the experience of your RFMC with respect to the acceptance of its plan (or proposed plan) by the states in your region?

Group 1: Experience, thus far, too limited to determine.

Group 2: Too few plans, yet, to make an informed judgment.

Group 3: Too early to judge.

8. To what extent do you expect state policy to be compatible with the management plan developed by your RFMC?

Mixed reactions; compatibility expected by most respondents.

a. Have state agencies expressed any overt antipathy to the actions proposed by your RFMC?

Group 1: None expressed.

Group 2: Certain states have, concerning specific fisheries.

Group 3: Yes--regarding specific fisheries.

b. Do the state agencies in your region have the authority to enforce regulations promulgated by the Secretary of Commerce to carry out plans developed by your RFMC?

Group 1: Authority varies from state to state--some yes, some no, some uncertain.

Group 2: Probably not; enabling legislation undoubtedly necessary in most if not all states.

Group 3: Probably not--possible exceptions.

c. What is the attitude of the state agencies in your region to MRF? Please list each state in your region and opposite the name of each state indicate a rating such as "favorable," "indifferent," or "hostile."

Several respondents in all categories complained that this question posed some "conflict of interest"; consequently, most states were indicated to be more or less favorably disposed toward MRF. Only one state (Maine) was labeled as "hostile" by any respondent; this was negated by several other "favorable" ratings. Eight states were characterized as somewhere between "indifferent" and "favorable." Most were classed as "favorable," without reservation.

9. What is your perception of the appropriate role for the National Marine Fisheries Service (NMFS)?

NMFS should act as the principal provider of science-services--furnishing needed data, performing relevant research, and providing both professional manpower and operational and programmatic funds--needed by the RFMCs in developing and monitoring fishery management plans.

a. Does the NMFS representative attempt to dominate the thinking of your RFMC, thereby to impose its preconceived plans or objectives?

Group 1: In some RFMCs, but not in others. Strong CF bias evident at times. Input usually well balanced.

Group 2: To some extent--sometimes necessary, though largely in a benign and useful manner.

Group 3: Commonly--by virtue of usually being the best-informed and prepared RFMC member.

b. To what extent has NMFS moved to enhance needed MRF inputs in your RFMC with respect to MRF statistics?

Group 1: Unaware of any significant movement to this end.

Group 2: No movement, in spite of urgent RFMC requests for new research initiatives

in predator-prey dynamics and MRF catch-effort relationships.

Group 3: No actions evident in this vital area.

c. To what extent has NMFS emphasized the ecological aspects of OY and moved to undertake biological research concerning the interdependence of fisheries or stocks of fish, thereby factoring into OY an ecological reserve of prey to sustain predator fishes of MRF significance?

Group 1: No evidence, as yet, of any changes in research mode to address this critically important area.

Group 2: No emphasis evident in current research program. Some verbal acknowledgment of RFMC representatives.

Group 3: Not at all--NMFS not addressing this fundamental aspect of OY.

d. On balance, are NMFS inputs to RFMC deliberations clearly constructive, helpful and objective, or are they biased in favor of the commercial fisheries?

Group 1: Generally objective and constructive, at regional level, but strong CF bias evident in central directorate, coupled with gross insensitivity to MRF.

Group 2: Generally helpful but clearly insensitive to MRF, if not actually biased in favor of CF interests.

Group 3: Helpful though not very objective. Biased in favor of CF interests.

Summary and Conclusions

Findings from this survey, reinforcing independent, firsthand observations of RFMC activities by the writer and other members of the Sport Fishing Institute professional staff, led to several conclusions. They range from encouraging to discouraging--even a little alarming.

General awareness within the RFMCs of marine recreational fisheries (MRF) interests seemed reasonably high, but tended to be sacrificed when in conflict with commer-

cial fisheries (CF) interests. Related to this circumstance was a clear imbalance of membership biased in favor of CF interests in most RFMCs (more than twofold, overall); more pronounced in some than in others. Consequently, the MRF interests, inadequately represented in the RFMCs, constituted a disadvantaged minority. A more or less corresponding imbalance also was reflected in the makeup of the Advisory Committees, as well as in the Scientific and Statistical Committees.

This adverse circumstance (disadvantaging of the MRF interests) was compounded by an inability on the part of the National Marine Fisheries Service (NMFS) and many states (several notable exceptions among them) to supply needed MRF catch-effort statistics and elucidate predator-prey relationships on a quantitative basis. Despite formal requests for same by several RFMCs, there was no evidence of any imminent redirections of the NMFS research and statistical program to accommodate these urgent needs in any reasonable time frame. Failure by the NMFS directorate to be responsive to RFMC needs in these vitally important areas is believed to reflect a gross insensitivity to MRF interests at best, an ill-concealed hostility at worst. In any event, such nonresponse clearly reflects an inflexible commitment by the NMFS leadership to a business-as-usual attitude for the agency in its traditional role as a government-sponsored commercial fisheries trade association.

Another significant finding that emerged from this survey was the view that state licensing of marine anglers is an increasing likelihood, but not an imminent one. There is a growing trend in sentiment, according to survey respondents, toward acceptance of state-issued MRF licenses as a desirable means of generating two desperately needed new MRF administrative tools. These are (1) a reliable data base required to help assure that share allocations from fish stocks for MRF use will be fair and just and (2) a reliable source of continuing funding for state programs of MRF research and management (including development of various angling facilities). There remains considerable opposition among marine anglers to the idea of licensing but, with increasing understanding of MRF issues and needs, that opposition is lessening rapidly.

In general, while optimism runs moderately high, RFMC experience has been too limited thus far to assess how and to what extent MRF, CF, and conservation interests will actually be accommodated in the development of specific fish management plans. Such contentious issues as allocations between MRF and CF uses of jointly used

fish stocks, rebuilding or rehabilitation of overfished or depleted stocks, establishment of ecological reserves of prey species to accommodate food requirements or predator species important to MRF and/or CF uses, setting of safety margins (perhaps 20 percent, more or less) in recognition of the low precision inherent in all estimations of maximum sustainable yield, as well as a number of other significant issues--in short, the crucial "gut-substance" of optimum yield fisheries management--have not yet been fairly addressed in the RFMCs, apart from preliminary rhetoric. The plain fact of the matter is that the optimum yield "bullet" has yet to be bitten.

A major impediment to the work of the RFMCs has emerged in clear perspective, partly reflecting, at best, an insensitivity to MRF interests. This obstacle is foot-dragging by the NMFS directorate in Washington, D.C., reinforced by companion passivity on the part of the NMFS regional offices, concerning the urgent requests by several of the RFMCs that NMFS develop substantial new research and statistical initiatives to serve their most pressing needs. These needs are for NMFS (1) to collect comprehensive data describing MRF participation, fishing effort, and harvest within acceptable limits of statistical reliability; and (2) to carry out comprehensive "biological research concerning the interdependence of fisheries or stocks of fish," as the Congress specifically mandated in the FCMA [Sec. 304(e)]. Lacking these kinds of information, it is not possible for the RFMCs, as charged by the Congress in the FCMA, to prepare and implement "fishery management plans which will achieve and maintain, on a continuous basis, the optimum yield from each fishery" [Sec. 2(b)(4)].

These distilled findings led this observer to the overall conclusion that the traditional role of the NMFS is no longer viable. If NMFS is to operate in the broad public interest and justify the multimillion-dollar investment by this nation's taxpayers, it seems urgent that the agency be reorganized and philosophically reoriented into a new mode of science-service to the RFMCs. Presently, the NMFS tail is wagging the RFMC dog. The RFMCs have, of course, been designated by the Congress as the new "dog"--and they ought to be wagging the NMFS "tail." That is not presently the case. Unless corrected soon, the entire structure may collapse like the proverbial house of cards. Though some narrow-minded folk may even want that to happen, America cannot afford to let it. It probably will happen, even so, unless some fundamental changes are injected at an early date into the philosophy and operations of the National Marine Fisheries Service.

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IMPACT OF EXTENDED JURISDICTION ON THE DOMESTIC SHRIMP INDUSTRY

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When the Congress first began work on extended jurisdiction legislation, the shrimp industry in the Gulf of Mexico was almost unanimous in its opposition, and for reasons we believed at that time to be valid. As the principal representative of the Gulf of Mexico shrimp industry, I appeared before committees of both houses of Congress in opposition to the original legislation. Representatives of the tuna and salmon industries also testified in opposition. One might logically ask how could fisheries legislation of such magnitude pass the Congress of the United States (US) when the three major US fisheries opposed it? First, strong lobbies from New England and the North Pacific supported the 200-mile concept and,

second, the tuna industry withdrew its objection when tuna were exempted from the bills.

The Gulf shrimp industry was concerned that the unilateral extension by the US of its fisheries jurisdiction to 200 miles would trigger similar action by the Republic of Mexico, and that such action by Mexico would deny US shrimp fishermen access to waters off the coast of Mexico in which they traditionally had fished. Ranking officials in the Mexican government had advised us that Mexico would not unilaterally extend its fishing zone unless the US took such action first, and it was not until HR 200 passed the US House of Representatives that Mexico initiated action to extend its zone to 200 miles. Several hundred US shrimp vessels periodically have fished in waters off the coast of Mexico every year. Landings of shrimp taken in these waters by US fishermen averaged about 10 million pounds per year from 1970 to 1975, with an ex-vessel value of $15 to $20 million per year. Fishermen in the Gulf of Mexico, unlike fishermen in New England and the North Pacific, have not suffered as a result of competition from foreign fishing activity and, therefore, felt that they had little or nothing to gain by extended jurisdiction.

The shrimp industry also was concerned that the great maritime countries which traditionally had fished within 200 miles of the US would not recognize the US claim to waters that historically had been considered by the World Community as international waters, thus creating the danger of confrontation. Fortunately, this did not occur, and Governing International Fisheries Agreements (GIFAs) have been negotiated with most of these countries.

The loss of the Gulf of Mexico shrimp industry's historic fishing grounds off the coast of Mexico will have a very serious economic impact on the shrimp fleet based in Brownsville and Port Isabel, Texas. Approximately 450 shrimp vessels are headquartered in these ports, and it has been estimated that about one-third of their fishing effort in the past has been spent in Mexico's new economic zone.

Under the terms of an agreement negotiated in 1976 with Mexico, 318 permits to fish in Mexican waters, with an allocation of 6 million pounds of shrimp, were made available to US shrimp fishermen for the year ending July 31, 1977. For the 1977-1978 year, the number of permits was reduced to 223, with an allocation of 4 million pounds of shrimp. One hundred and twenty-seven Mexican permits will be available to US shrimp fishermen

for the year ending July 31, 1979. For the final five months of 1979, only 95 permits will be made available to US shrimp fishermen. After that date no further foreign fishing for shrimp will be authorized in Mexican waters, unless it can be established that a surplus of shrimp exists.

Although the Brownsville/Port Isabel-based shrimp fleet will be adversely affected by the loss of fishing privileges in Mexican waters, the impact on the overall shrimp industry in the Gulf of Mexico, and in fact the nation, will be minimal. In 1976 shrimp landings in the US were a record 403.6 million pounds, an increase of 17 percent over 1975. Shrimp landings in the US were valued at $331.4 million in 1976 at dockside, up 46 percent from 1975. The Gulf states accounted for 52 percent of the total production, with 210.1 million pounds landed with a value of $275.2 million. These figures represent a 23 percent increase in volume and a 54 percent increase in value over 1975. The South Atlantic states landed 26.1 million pounds, an increase of 5 percent over the previous year. Without question, the shrimp fishery in the US in 1976 had its most profitable year in the history of the industry.

In the final stages of work by Congress on S. 961, Senator Warren Magnuson, author and prime mover of this legislation, called a conference of leaders of the various fisheries in the US to hear their views and recommendations. As a result of this conference, and thousands of written comments, some very significant changes in the draft bill were made and more emphasis was placed on the conservation and management of marine resources in the new zone.

As finally enacted into law, the Fishery Conservation and Management Act (FCMA) is without question the most important fisheries legislation in the history of this country. And it offers all user groups the unique opportunity to participate in the management of marine resources where little or no management had existed in the past.

The FCMA provides for the establishment of eight Regional Fishery Management Councils (RFMCs) with broad authority to recommend fishery management plans (FMPs) to the Secretary of Commerce for approval and implementation. Council members were appointed by the Secretary of Commerce from lists of nominees submitted by the governors of the coastal states. Membership on the RFMCs represents the fisheries conservation agencies of the states and the federal government, the US Coast Guard,

the academic community, and all segments of the fishing industry--both commercial and recreational. Each of the RFMCs has established a Scientific and Statistical Committee and Advisory Panel to provide RFMCs with necessary scientific data and advice from the various user groups. Public hearings will be held in order for the RFMCs to have the broadest possible public participation in the development of FMPs.

The FCMA requires that an FMP be made by the appropriate RFMC when applications for fishing permits in the fisheries conservation zone (FCZ) are made by a foreign country. The law provides that permits to fish in the FCZ shall be granted to foreign fishermen if the RFMC finds that a surplus of the desired species exists and cannot be harvested by US fishermen. Applications to fish for shrimp in the FCZ have been made by Cuba. Because of the importance of the shrimp industry in the Gulf of Mexico and in the nation, the Gulf Fishery Management Council (GFMC) has given highest priority to the development of a shrimp management plan.

Fishery management plans, as required by the FCMA, shall be based on the best scientific data available. The RFMCs, at least our GFMC, are finding that the data on most species for which a plan must be developed are inadequate. Although a great deal of money and effort have been spent on shrimp research in the Gulf of Mexico, much of the data are incomplete and uncoordinated. The National Marine Fisheries Service; the Gulf States Marine Fisheries Commission by contract with the Gulf Coast Research Laboratory at Ocean Springs, Mississippi; and the Scientific and Statistical Committee of the GFMC are working to analyze all the data on shrimp stocks in the Gulf of Mexico and will recommend intensified research in the areas where scientific data are either inadequate or totally lacking.

At the September meeting of the GFMC, the Center for Wetland Resources at Louisiana State University was awarded the contract to prepare the GFMC's shrimp management plan. The first draft will be completed in 14 months. This, however, is only the first step. In my view, the plan will be revised and changed many times as new data become available, and to meet changing conditions in the fishery.

Although the RFMCs, by authority delegated under the FCMA, have jurisdiction only in the FCZ, the GFMC will include the bays and wetlands which are under state jurisdiction in its shrimp management plan. Management options developed by the plan will be recommended to the states. Management of estuarine-dependent stocks of

shrimp in state-controlled nursery grounds is vital and, unless close cooperation between the states and the GFMC is achieved in developing an overall management plan for the resource, there is the possibility that there will be no shrimp stocks in the FCZ for the GFMC to manage.

The FCMA introduced a new concept--optimum yield (OY), as opposed to maximum sustainable yield (MSY). The MSY concept has been around a long time and, very simply stated, means that the users of a renewable resource may take on an annual basis the maximum number of pounds, or individuals, of a particular species without endangering the stocks. This concept, however, never has applied to the shrimp fishery because it is an annual crop. Environmental factors, such as the inflow of freshwater into the nursery areas, amount of rainfall, salinity levels and temperature, rather than fishing pressure, determine the abundance of shrimp in any given year.

Optimum yield is an altogether different matter, and is defined in the FCMA, Sec. 3(18), as follows: "The term 'optimum' with respect to the yield from a fishery, means the amount of fish--(A) which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational opportunities; and (B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor."

The concept of OY means many things to many people. To clarify its meaning and consider its impact on fisheries management, OY was the subject of a symposium held by the American Fisheries Society in Honolulu on September 9, 1974, and a national symposium in Houston, Texas, June 6-10, 1977.

It is when we crank the OY concept into a fisheries management regime that the FCMA has its greatest impact. The shrimp fishery in the Gulf of Mexico is divided into four distinct user groups--the bait fishery, the bay commercial fishery, the bay recreational fishery, and the offshore Gulf fishery. Like most fishermen, each of these groups would like to regulate the other groups, but objects to the imposition of regulations on itself. To those of us involved in the industry, and in RFMC planning, it appears that we will actually be more involved in managing people than fish. A management plan, which must address all the factors involved in OY, will be based on socioeconomic and political considerations, rather than biological factors. We are hoping that any plan will contain adequate scientific, economic, and

sociological data to be acceptable to a majority of those affected by the plan, as well as to the political entities which represent them. This will be our most difficult task because fishermen, particularly shrimpers, are independent thinkers, highly opinionated, and not likely to give up their pet prejudices and misconceptions without a fight.

There are conflicts within the shrimp industry on when and at what size shrimp should be harvested. The bay fisherman, the bait fisherman, the weekend sports shrimper, and the wide-ranging Gulf shrimper all depend on the same resource, but harvest that resource at different stages of its development. Again, we see a different meaning of the OY concept as it relates to the several segments of the shrimp fishery. If we apply OY as viewed by the Gulf shrimper to the bay operator or the smaller bayou fisherman in Louisiana, they would be out of business. Several million pounds of small shrimp are harvested annually by bay fishermen. If these shrimp were permitted to reach maturity they would move into the Gulf and be unavailable to the bay fishermen. There also is disagreement among biologists about the effect of a heavy annual harvest of immature shrimp in the bays. Some marine biologists maintain that the present level of harvest of small bay shrimp does not materially affect the availability of the resource later in the year in the open Gulf. Others are skeptical, as are the Gulf shrimpers, who see tons of tiny "eyeballs and whiskers" taken in the bays and realize that in a few weeks these small shrimp would reach an optimum size for their market and might be available to them.

The waves ahead of us will be rough and the storm probably will reach hurricane force before we complete our assignment. But complete it we will. We may end up with a lot of fishery management plans full of holes and compromises, but they will improve with time and work; and they will be far better than anything we have had in the past.

IMPACT OF FISHERIES MANAGEMENT PLAN IMPLEMENTATION--A STATE PERSPECTIVE

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My remarks will deal with the impacts of implementation of the Fishery Conservation and Management Act (FCMA) seen from a state perspective. I think this requires some further elaboration. I intend to consider impacts on fisheries development, but also impacts on the fishery resource management process as viewed from the state level. To phrase the latter somewhat differently: What will be the impact of implementation of the FCMA on fisheries management as it is now practiced by the individual states?

In the remarks that follow, I will attempt to speak from the perspective of a state fisheries director; however, many of the attitudes expressed will be at least modified by my experience as a Regional Fishery Management Council (RFMC) member. Also, my remarks will not deal with the question of states rights vs. federal jurisdiction except in a very indirect and peripheral sense.

We should recognize from the very beginning that there is probably no such thing as "the state perspective" on implementation of the FCMA. If we have 25 coastal states, then I would suspect in all honesty we have 25 different state perspectives. Every state can be expected to react somewhat differently and, in some cases, the differences may be rather dramatic. Even so, there probably are some groupings of states where the similarities in reaction and the problems to which they are reacting are likely to overshadow the differences.

In order to talk about future impacts, we should start with a set of assumptions; that is, (1) the FCMA will remain in force in essentially its present form for at least the next four or five years; (2) the RFMCs, working in conjunction with the National Marine Fisheries Service (NMFS) and the Secretary of Commerce, will collectively achieve at least a moderate level of success in implementing the Act; (3) the harvest of stocks in the Fishery Conservation Zone (FCZ) will be returned to the domestic fisheries, at least for those stocks which are of special interest to the United States (US); and (4) within a reasonable period of time, fisheries for those stocks especially useful in this country in the FCZ will

become fully developed, at least within the context of optimum yield (OY) as it is presently being interpreted. Another point, which may or may not be an assumption but is a qualification on all of the foregoing statements--we are dealing with recreational fisheries as well as commercial fisheries.

One further point in dealing with the impacts must be kept in mind; that is, impacts can be either positive or negative, or they can exist but be essentially negligible. Although this point seems self-evident, we tend to focus on negative impacts and ignore positive ones.

I would like to begin this discussion by attempting to identify what seem to be some of the factors which for individual states are likely to determine both the nature and the direction of the impact. Certainly, one point that should be considered here is whether the fisheries in question already are a significant component of the state's economy, or whether we are dealing with a fishery which is so minor that it seldom rates any significant consideration in the state decisions. One exception to this is that we do have fisheries--and the oyster industry in some areas might provide an example--which may appear not to be very important from a general economic viewpoint, but for reasons I have never fully understood are politically very important in any state decision-making process.

Another factor that is going to determine the direction and nature of impacts is the relative distribution of, and the relative magnitude of, harvest of a given fishery in a given state in terms of the territorial and internal waters as opposed to the waters of the FCZ. In other words, is this an inshore fishery largely in state waters or one that is almost entirely restricted to the FCZ?

A third very important factor in determining impacts is the condition of the fishery stock in or adjacent to a given state prior to the passage of the FCMA.

Another point that would certainly enter into any consideration of impact for a given fishery on a given state is whether the fishery is predominantly a commercial fishery, a recreational fishery, or like so many, mixed in terms of its utilization.

Just from considering the foregoing points, one can look at a state such as Massachusetts, which has long been dependent on a variety of offshore fisheries that have been subject to very heavy foreign fishing pressure,

and conceive of a whole set of impacts. On the other hand, if one compares this with a state such as Georgia or my state of South Carolina--where the fisheries have been predominantly inshore fisheries, where we have been little subjected to inroads of foreign fisheries exploitation--quite a different set of impacts can be imagined.

Let us turn now to some of the specific examples that might be related to the previously mentioned points. In some cases, I may have a state in mind; in other cases I may be dealing with generalizations that may not be met fully by any particular example.

Let us start with a case where a fishery stock is badly depleted but conceivably could be restored. Or, a case where a fishery is undeveloped and could be fully developed. Then, one could expect a particular set of impacts on the state level. In this case, one could assume at least some of the following impacts on the economy of the state involved, though not necessarily impinging on the resource management process.

First, there certainly should be an increase in and modernization of the locally based fishing fleets or at least better utilization of existing vessels which presently may be underutilized. Certainly, one would expect an increase in shoreside facilities to construct, house, and service the fleet; and to provide unloading, landing, and packing facilities. Depending on the nature of the fishery and its magnitude, one might well anticipate an expansion of shore-based processing facilities, or again fuller utilization of existing facilities if they are underutilized. If increased fisheries landings are not processed within a given area, then there is likely to be increased activity in the transportation network. If the fishery in question is predominantly recreational, then there certainly should be increased opportunities for recreation for local residents of the state. Very likely, there may be increased opportunity for tourism development and an increase in all those commercial services that are required to support recreational fisheries, and in addition some increase in the local food supply. With regard to food production, if the fishery in question is a commercial operation, then certainly there should be an increase in high-quality food supply for domestic consumers or, perhaps, food would be available for export; or at least our dependence on imports would be lessened.

All of these might impact favorably on the state; but again we are talking about a general range of economic impacts and not those which would impinge neces-

sarily on the resource management process. Certainly, all of the aforementioned impacts would, for the most part, be considered positive or favorable impacts.

Let us now take that same set of circumstances and attempt to project likely impacts on the existing state resource management process. The first point I would like to make is that this is one of the cases where the relative importance of the inshore vs. the offshore fisheries comes very much into play. The more important the inshore component, relative to the offshore, the more impact could be expected on the state resource management process. In the reverse situation, the converse would be expected to prevail. In some cases the states may be forced to adopt regulations in their territorial waters which may run counter to local political attitudes. This may, in some cases, provide a real problem at the legislative level and those difficulties may impact negatively on the resource management agency. I would hasten to add that this is perhaps a shaky generalization, at best.

Secondly, I believe that in the case already described most state fisheries managers and their staffs and agencies are going to look at the new management regime as a partnership approach among state, federal, and regional bodies. At least I very sincerely hope that this will be the case. After all, the state fisheries managers are well represented on the RFMCs, and would have nothing to blame but their own limited effectiveness if their views were not fully considered. Whether state government at large and state legislative bodies in particular would take this view remains to be seen.

At this point I want to put forth another of those risky generalizations, and I would express it this way: the more state government perceives a function to be a feceral role, the less interest state government is going to show in that function. This is especially so in the fiscal support of that function. This is one of those potentially negative impacts that gives me some concern. State government as a whole traditionally has been slow to assume its responsibility in marine resource management, although notable exceptions could be cited. In recent years many states have done much better in this regard. If the federal role and the RFMC role in the FCZ do bring about a lessening of interest on the part of states in the marine resource management process and that lessening of interest results in a reversal of the already favorable trend referred to, then one could foresee a significant adverse impact on the resource management prccess. I sincerely hope that this does not occur.

Let us turn now to a brief consideration of how state geography itself might influence how a state reacts to implementation of regional fisheries management and what kind of impact it conceivably would have on the resource management process. The first thing we have to remember is that states may be equal in some respects, but geographically, and especially in terms of length of coastline, they are tremendously unequal. And this is going to have a very significant influence on reaction. The State of Georgia has a linear coastline of approximately 150 miles. South Carolina has a linear coastline of somewhere between 150 and 200 miles. Now, these are comparatively speaking very small coastal blocks. And certainly, as a state resource manager, I have had to recognize without any hesitation that in attempting to deal with migratory fisheries stocks this is far too small a geographic unit to have much significance. Certainly, my colleagues in Georgia would agree that this is the case. And yet, the length of our coastlines may be relatively large when compared to some of the smaller, more crowded New England States. So, one might expect that the states with a small linear coastline would tend to look at their role in regional fisheries management as an opportunity to do something that geographically they had been prevented from doing effectively prior to that time. And this could be very definitely a favorable impact on the resource management process in those states.

On the other hand, one can compare the State of Georgia or the State of South Carolina with its regional neighbor, Florida, where the linear distance of the coastline is in excess of 1,000 miles; Florida claims that its actual measurable coastline is something in excess of 8,000 miles. Now, in this case, the State of Florida may encompass the same amount of coastline as do some entire regions of the country. Here, one might expect the fisheries resource managers to take a somewhat different view. They have been dealing for many years with a very large block of coastline. They certainly have not had the hindrance some of the very small states have which recognize that a migratory stock may pass through their state waters in a matter of a day or two. If I were a resource manager in Florida, I might not look at the implementation of the FCMA with the same degree of enthusiasm I do as the state manager for a very small state, who now has the opportunity to deal with fisheries management on a regional basis.

I would like to add one other geographic consideration which is at least of interest to me. That is, I think it makes a difference in how a state is impacted

depending on whether it has a north-south coastline or an east-west coastline. This might seem very strange at first mention. However, there is a good example in this case, dealing with the most important fishery in this nation in terms of the dollar value of the harvest, and that is the penaeid shrimp of the Southeast and Gulf of Mexico. In our four southeastern states--North Carolina through the east coast of Florida--where we are dealing with a north-south coastline, the distribution of harvest of shrimp and migratory pathways is almost entirely within state waters. And I would estimate that the ratio of harvest is somewhere in the neighborhood of 95 percent within state waters and only 5 percent in the FCZ. Consequently, our RFMC thus far has taken the position that it is not appropriate to deal with shrimp under the FCMA. On the other hand, on the Gulf coast we are dealing with a predominantly east-west shoreline, although recognizing that the west coast of Florida is north-south as is a part of the Texas coast. In this case, the migratory movements of shrimp tend to be inshore-offshore rather than along the shore, and a very significant portion of the harvest occurs out in the FCZ. Consequently, the Gulf Fishery Management Council is pursuing very vigorously and giving very high priority to the development of a management plan for shrimp. This is exactly the opposite of the situation one finds in the South Atlantic. Now, in this case, where there is very little difference in philosophy on how to deal with the resources, just the physical facts of geography are making a difference in how the two RFMCs are approaching a virtually identical fishery.

The last area I want to deal with concerns solely the resource management process and some potential effects of implementation of the FCMA on state marine resource management. And this comes back to something mentioned earlier, and that is this partnership approach among the states, the federal government, and the regional agencies--the RFMCs. This is where the greatest impact from implementation of the FCMA potentially could occur. And the impact, in this case, should be almost entirely positive should the states choose to take advantage of what I consider to be an opportunity. We have recognized in many cases that as individual states we were unable to deal effectively with a fishery resource, even though it might be largely within territorial waters, so long as it regularly migrated across the borders of adjacent states.

I am not talking here about a fishery that traditionally has been out in the international waters where we simply had no jurisdiction to deal with it, but rather I

am referring to fisheries that have been predominantly instate, but where a single stock has shared the waters of perhaps three or four adjacent states. In the case of many fisheries this does give us an opportunity which, if we as state fisheries agencies fail to take advantage of, we have made a very tragic mistake. And again, I am dealing with fisheries that at least have some component of the harvest within the FCZ. This gives us an opportunity to deal with instate, inshore fisheries as a region in a manner we have never had the opportunity to before. I have heard a good deal of discussion on this, especially on the Gulf coast where the shrimp fisheries have been of tremendous importance to each of the Gulf states. The resource does move back and forth across state waters. Shrimp also move inshore and offshore across the boundaries of the territorial sea. The Gulf Fishery Management Council seems to feel it has an opportunity, as never before, to come to grips as a large-scale region with a fishery that is very much dependent on both internal waters of the states and the territorial seawaters of those states. This is where we have perhaps our greatest opportunity and the greatest potential impact. And in this case, the impact in my judgment would be very much a positive impact on the resource management process and on the state economy as influenced by the fisheries.

An additional advantage might at least be predicted at this time. The clear language of the law with regard to considering the interests of all users of a resource in the development of management plans is requiring a re-evaluation of current practices in the minds of some state fisheries directors. So often we have only attempted to deal with those fisheries which are entirely commercial or, if the fishery were mixed, have dealt only with the commercial component. This latter condition may be quite unfair to either the commercial or the recreational user, or in some cases to both. Our awareness of this problem should be much enhanced.

Let me bring these remarks to a close with one observation that may have some relevance to this discussion: impacts are not determined simply by what is imposed by implementation of the FCMA in the FCZ, but are equally determined by how the states react to implementation. To restate this in a somewhat different form, the implementation of the FCMA provides certainly a set of problems the states have to cope with; but much more importantly it provides a set of opportunities the states can react to. Drawing some net figure on impact--whether the impact is positive, negative, significant,

or insignificant--will depend not so much on what happens out in the FCZ through the implementation of the FCMA, but more so on how the individual states react to what happens. Therefore, it is really incumbent on the individual state to determine whether it is going to take advantage of these opportunities and ensure that implementation of the FCMA, both in an economic sense through enhancement of the fisheries and in the effectiveness of the resource management process as now practiced, is going to be positive or negative. The opportunities for favorable and positive impacts from a state perspective are great. The evidence at this point clearly indicates that the opportunity for favorable impacts far outweighs the potential problems the states may have to deal with. And, of course, I hope that this turns out to be the case.

CONSERVATION: THE ESSENTIAL ELEMENT

Michael E. Berger
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National Wildlife Federation

Marine ecosystems and marine resources are not subjects of recent concern to the National Wildlife Federation. Since its founding, the Federation has supported and encouraged the conservation of all natural resources. Our concern for marine resources is not generated by any particular interest in a specific fishery or in a commercial or recreational activity, but rather by the overall importance of marine resources and the environments they require to thrive. If the oceans are not cluttered up and degraded by pollution, if the coastal spawning and nursery areas are not destroyed by contamination and destruction, and if the rivers that support anadromous runs are not converted to ditches and sewers, there will be fish and shellfish resources for many kinds of uses for years to come.

These concerns are consistent with a resolution adopted earlier this year by representatives of our 53 affiliate organizations. This resolution "recognizes that man's growing need for food, transport, minerals, and energy fuels now levied against the oceans and adjacent coastal areas should be met with means which are efficient and economical but compatible with the continued productivity of the natural environment and con-

sistent with the resource management policy of sound conservation practices." Conservation is the basis of our concern. I do not feel it was happenstance that Congress chose to title the Act the "Fisheries Conservation and Management Act" (FCMA). Conservation was their principal intent in passing this landmark legislation.

My concerns extend beyond protection of marine habitats, however. When we lent our support to the concept of a 200-mile fishery conservation zone (FCZ), it was on the basis of conserving resources which were being badly depleted by foreign fishing fleets. This is a concern for the fisheries resources themselves. It is our firm conviction that populations and species should be managed carefully so that they can remain productive without depletion or reduction to the minimum limits of survival. Conservation, not exploitation, of stocks is the goal. However, to achieve this goal, sound scientific population data are required. And at present such data are not abundant.

My third concern is that the harvestable part of fisheries stocks be shared in some equitable fashion among many users. This is a view that has been urged by the Sport Fishing Institute for many years. The bottom line is that commercial interests, recreational interests, and conservation interests must somehow agree on sharing the optimum yield. The FCMA does not intervene to reduce foreign catches merely for the benefit of United States (US) commercial fishermen. It reduces catches for the benefit of the fish stocks so that all users may share the proceeds from these complex and varied natural resources.

There we have what I regard as a very stable tripod position: concern for the environments, habitats, and ecological situations necessary for the continued production of the resources; concern for the management of the populations themselves so that they are not overly exploited; and concern for the users so that no single group of harvesters monopolizes the catch. You will note that conservation is the essential element implied in each concern.

When extended jurisdiction began to receive serious consideration there were some indications that at least a few individuals were looking upon this new development as a means of saving the resources for their own exploitation, rather than for long-term conservation. The Federation was considering, at one time, taking some sort of legal action to require that the composition of the Regional Fishery Management Councils (RFMCs) have represen-

tation from conservation interests equal to that from user interests. Although we remain concerned, our position has relaxed a little. Appointments to the eight RFMCs have been a bit more balanced than we anticipated. The first generation of RFMC members will soon be replaced, however, and the new nominees are being screened carefully by conservation groups to determine what their background interests might be.

One interesting impact of the FCMA was felt even before it became effective on March 1, 1977. In February the fishing pressure inside of the 200-mile limit (measured by the numbers of foreign vessels fishing there) dropped by about 50 percent from the number in February, 1976. Thus there was some conservation, or at least reduced exploitation, of fishery stocks prior to official implementation of the FCMA. It is true that fishing effort climbed back up again, but with consistent and persistent enforcement of FCMA provisions by the US Coast Guard, catches should be cleaner and with less by-catch in each haul than during the previous year. Domestic catches may have increased somewhat (at least in the North Atlantic region) as foreign processors increased their purchases from US fishermen. However, the effects of these activities on fish stocks are not yet known.

A beneficial, though as yet unquantified, impact has been the requirement that environmental impact statements and fishery management plans be prepared for each regulatory proposal. We are hopeful that such statements and plans will consider fully the impacts and demands of the recreational fisheries rather than considering only the commercial aspects. A case in point is Atlantic mackerel, which are utilized to a greater extent by recreational fishermen than by US commercial fishermen. Despite this fact, the National Marine Fisheries Service (NMFS) based suggested allotments for foreign fishermen on commercial landings alone, ignoring the recreational take and the ecological dependence of other fish species on the mackerel. I am sure that other examples could be cited.

Thanks to the FCMA, there is a greater concern for the environmental consequences of each action since the Fish and Wildlife Coordination Act, the Coastal Zone Management Act, the Marine Mammal Protection Act, and the Endangered Species Act also must be obeyed. Environmental considerations are now a part of the deliberative process.

Few positive impacts on recreational fishing are as yet obvious, but should be soon. The catches of the

estimated 30 million US sport fishermen seem to be about the same as before the FCMA. An example of the kinds of problems that can be rectified under the FCMA is the current dissatisfaction over the billfish catch by tuna long-liners. Billfishes are an extremely important recreational attraction and economic resource in many areas of the western North Atlantic, the tropical Atlantic, the Gulf of Mexico, and the Pacific Ocean. Recently, however, foreign long-line tuna fishermen--under few if any prohibitions concerning the use of fish having high mercury content--have increased their incidental catch of billfishes. Today, in some areas, billfishes account for more than half the tuna-directed long-line fishery. Although the primary target is claimed to be tuna (they being the only exception under the FCMA--a situation requiring change), when the majority of the catch is billfishes, the fishery becomes one directed at these species, regardless of the avowed intent. Overall, however, improved bilateral and multilateral agreements appear to offer the best chance for a permanent solution.

The implementation of the FCMA requirements for fishery management plans and for protection of US fishery resources within the 200-mile zone now offers an excellent opportunity to protect and develop a valuable domestic recreational fishing resource and to regulate an expanding recreational industry within sensible guidelines so that its resource base is not depleted and the economic returns do not collapse. The Federation believes steps should be taken now to protect billfish stock. If long-lining cannot be made more efficient toward the directed fishery, this activity should be prohibited within the range of offshore recreational fishing. Since Mexico now prohibits this activity out to 200 miles, the move is not unprecedented. Establishment of a zero by-catch allotment for billfishes also might be a constructive measure. In addition, under the FCMA, the NMFS could declare that no surplus of billfishes exists within the 200-mile zone, over and above the catching ability of domestic recreational and commercial fishing industries. In effect this would allow no foreign allotment whatsoever, thus eliminating direct competition and conflict between foreign and domestic fleets for billfishes. Such action would be in the best interests of conservation, and is only one of many examples of ways to improve marine recreational fishing opportunities under the FCMA.

The FCMA is now seven months old. So far, extended jurisdiction practices may not have helped the environments and habitats much, or protected the fish stocks that comprise the natural resource, or benefited the

other users of the resource. But, such practices have done no great harm either, and they have the potential for great good, if--and the "if" should be emphasized--enough data on population status and stock recruitment and catch by commercial and recreational gear can be collected quickly. We already know a great deal about the biology of many species, but dangerously little about the quantitative aspects of fish populations and stocks. To the extent that the FCMA inaugurates research of these topics, or creates demand for improved catch record-keeping, it promotes conservation.

This infant FCMA had a gestation period of at least 16 years in the executive and legislative branches of government before it was born. It will have to develop for longer than seven short months for us to evaluate accurately and objectively its potential. All we know is that it looks like a beautiful baby with a few external defects, but we need more inside information to predict the impacts this baby will make as it grows up. And, given conservation as the essential element in its development, the FCMA will undoubtedly grow to adulthood assuring fisheries resources availability for this and many future generations.

many new ideas and concepts have been tried. Not all of those ideas have worked, but many have. And we believe that we are well on our way to implementing a conservation and management system that will benefit the nation.

Some effects of the FCMA are obvious. Some effects have been immediate. Some will not be realized fully for years to come.

First and foremost, the importance of marine fisheries is getting more recognition by the public, government, and Congress. The status of fisheries leadership is being upgraded in the National Oceanic and Atmospheric Administration (NOAA) to the assistant administrator level. I am confident the importance of fisheries will become even more evident to the American people as the implementation of the FCMA progresses.

Perhaps the least discussed or recognized feature of extended jurisdiction is that it has radically changed the way fishery management programs will be planned and executed in the future. I do not mean just the National Marine Fisheries Service (NMFS). Under the term "we" are included the NMFS, Regional Fishery Management Councils (RFMCs), states, Sea Grant, universities, recreation and environmental groups, industry, the US Coast Guard, the Department of State, NOAA's National Ocean Survey and Office of Coastal Zone Management, and other agencies and organizations that have an interest in or may be affected by extended jurisdiction.

The establishment of the RFMCs entails a new concept in the management of fisheries resources in that those who are most affected by the FCMA have an opportunity to play an active role in developing the rules and regulations that will control their own livelihoods.

The RFMCs have done a remarkable job when one remembers that the first appointments were made about 14 months ago. Since then they have hired staffs and begun operating as organizations which have had no precedence.

The first regulation of a domestic fishery under the FCMA occurred when the Secretary of Commerce implemented emergency regulations for haddock, cod, and yellowtail flounder in March upon recommendations from both the New England and Mid-Atlantic RFMCs. This plan was produced only seven months after the RFMCs were established and exemplifies the aggressive spirit of RFMC members.

The plans are unpopular with some, and I am sure any future plans will not please everyone. The adoption of

an ocean salmon management plan for the west coast brought strong opposition from the commercial trollers in the area over the loss of part of their trolling season. However, the Pacific RFMC took steps to protect the resource and to follow the requirements of Judge George Boldt's decision, which requires special consideration for treaty Indians.

The Pacific RFMC actively sought public input for the salmon plan through hearings and obtained the best available information. The Council prepared a management plan, modified it according to suggestions from the Secretary of Commerce, and the plan went into effect in the face of some strong opposition. The plan has been challenged in court and sustained. The judge praised the Pacific RFMC for its product based on the information available. This is another indication of the dedication of the RFMC members in carrying out their responsibilities as they understand and interpret them.

I feel that all RFMCs will have problems with the management plans they produce, but I am sure they will all do the best they can with what they have. And, as more and better information becomes available, they will do an even better job. It is important they get on with the job, and they are doing that.

Another obvious effect is the reduction of the large number of foreign ships fishing off our shores in some of the richest fishing grounds in the world. In 1975 over 2,700 foreign ships were off our shores catching any and all of the species they could find. Since March 1, 1977, we have permitted only 681 foreign fishing ships to fish, and then only for amounts that are over and above what is needed to maintain healthy stocks and is surplus to what the US fishermen will take during the year. In addition permits were issued to 199 foreign fish processing and support vessels.

With strict enforcement and increased requirements in reporting procedures and improved data-processing systems, both at regional and national levels, the US is in the best position ever to manage her marine fisheries resources. The FCMA will help to prevent stocks from becoming depleted because of overfishing by either domestic or foreign fishermen.

Between March and August, 1977, agents of the NMFS and the US Coast Guard made over 900 boardings of foreign fishing vessels to ensure compliance with our regulations. We have issued over 200 citations and almost 80 notices of violations for infractions of regulations. Most of

the infractions have been minor; however, these activities do show the foreign skippers we are serious about the law and intend to enforce it. I might add that the cooperation received from foreign governments has been good and that they are making a determined effort to abide by our regulations.

We also have been active with the program which places US observers on foreign fishing vessels for periods ranging from two weeks to several months. These observers monitor compliance with the regulations, take biological samples, and observe the fishing methods and gear used by those vessels. This gives us a good indication of the fishing effort of the foreign fleets. As of September, 1977, observers had been on over 200 foreign fishing and processing vessels within our 200-mile conservation zone.

The FCMA has helped US fishermen in other ways.

Let us look at a few examples.

For a number of years Cuba has had a traditional fishery for snapper/grouper off the west coast of Florida. Our Law Enforcement Division estimates the Cubans operated 50 vessels in this fishery and took an estimated 4 to 5 million pounds of snapper/grouper each year prior to implementation of the FCMA. There have been no sightings of Cuban vessels off the west coast of Florida since the law went into effect. One then can assume that an additional 4 to 5 million pounds of snapper/grouper are available to the domestic fleet because of the new law; however, this cannot be substantiated statistically at this time. The charter boat fleet operating out of St. Petersburg experienced very good catches of grouper during the summer of 1977.

We have indications that shipbuilding in the Southeast and along the Gulf Coast has increased. Ships from these areas are being used in other parts of the country and indicate a feeling of confidence in the future of the US fishing industry. Of course, this growth cannot be attributed directly to the FCMA, but certainly it has played a part in the increased production.

On the west coast there are indications that investments are being made in vessels, gear, and processing equipment so that US fishermen can become active in the hake fishery there. These domestic firms know they will have the first crack at this large resource, if they demonstrate the capability to harvest and use it. They no longer need to fear that their investments will have

a short economic life span if the resources become the target of heavily capitalized and subsidized foreign fishing fleets. With a more secure resource base, these entrepreneurs have a better incentive to develop the tools, techniques, and markets for a profitable domestic fishery, with beneficial impacts on income and employment. Similar results can be expected in many areas of the US in the future.

Other indications are an increased interest by banking and brokerage companies in financing fishing operations and vessels in the Northwest, and the expansion and new construction of processing plants in Alaska to process the groundfish found in Alaskan waters.

We believe that the states are among the major winners under extended jurisdiction and we intend to follow through on earlier efforts to expand on the existing strong partnership with states in all areas of fisheries management. Several years before passage of the FCMA, the NMFS initiated a State-Federal Fisheries Management Program to foster state-federal and interstate cooperation and coordination in fisheries management. The Program was intended to assist the states in resolving problems that went beyond the confines of federal authority or single-state jurisdiction. We believe the FCMA embodies the same spirit of partnership as the State-Federal Fisheries Management Program and strongly endorses the concept of state and federal cooperation to resolve fisheries management problems.

Some of the problems first addressed in the Program will be resolved through the new RFMCs. For example, under the State-Federal Fisheries Management Program, a major study of the dungeness crab fishery off California, Oregon, and Washington was initiated. State participation was coordinated through the Pacific Marine Fisheries Commission. The Pacific RFMC will find that study to be extremely valuable as a basis for development of a Dungeness Crab Fishery Management Plan. Thus, through the RFMC mechanism, we will follow through on some earlier State-Federal Fisheries Management Program efforts.

I believe the states must continue an active, aggressive program in fisheries management. They should not feel that the work being done by the RFMCs is a substitute for their efforts or for the funds that they have available for fisheries management.

I understand that members of Florida's state legislature have scheduled a meeting next month to discuss

that state's role in fisheries management and how the roles of the state and federal governments can enhance each other for a better management program. I encourage this cooperative approach which can only benefit the resources that all of us are trying to protect and make more productive.

All has not gone as we would have liked. There is considerable concern about the incidental take of billfishes in the foreign long-line fisheries for tuna. The NMFS has prepared Preliminary Management Plans (PMPs) for the Atlantic and Pacific coasts to regulate foreign catch of billfishes and sharks. We expect to have these PMP's in effect before the end of 1977. In addition, the South Atlantic and Western Pacific Fishery Management Councils are working on management plans that will regulate the catch of these species for both domestic and foreign fishermen. These Councils intend to complete their management plans during 1978.

What lies ahead for us? I see a lot of hard work on the part of the states, the RFMCs, and the federal agencies. I see the need for more involvement by the fishermen, processors, consumers, conservationists, and all who are interested in the future of fisheries. They must work closely with the RFMCs and make known their ideas on the many issues so that the RFMCs' products will benefit the most people as well as conserve the resources.

There is a need to get into place more fishery management plans which relate to all foreign and domestic commercial and recreational fishermen who harvest our resources.

We believe the RFMCs will encounter some difficulty in obtaining the information they need to develop plans on short notice and to make defensible decisions on dividing the harvest among all fishermen. Once again, this points out the need for public input to the RFMCs when they are preparing their management plans.

There appears to be a widely held belief that the 200-mile zone only applies to foreigners. Nothing could be further from the truth. As the RFMCs prepare more and more management plans, people are going to realize the law applies to all, and that its major purpose is to conserve the stocks. Domestic fishermen are going to have to take cuts in the amounts of some types of fish they catch so we can meet the requirements of the FCMA. Better use of everything that is caught could possibly ease the pain of cutbacks on some of the more popular species. This is a tough one; however, it must be considered by all who are interested in fisheries.

There are going to be problems with allocations of the harvest that is available, and not so much in the foreign arena as on the domestic scene. Undoubtedly, there will be redistribution of the catch in many fisheries based on the optimum yield (OY) concept. People are going to have to be very objective and put aside their own personal interests for the good of the country. This may be very difficult for some to do, but it must be done.

Reasonable and realistic estimates of the amounts of fish US fishermen can harvest must be made by the RFMCs. The FCMA says that the amount allocated to foreign fishermen "shall be that portion of the optimum yield of a fishery which will not be harvested by vessels of the United States." On several occasions I feel the amount to be caught by our own fishermen may have been overestimated, which could mean a loss of valuable fooc supplies to other parts of the world. The estimate should be more accurate.

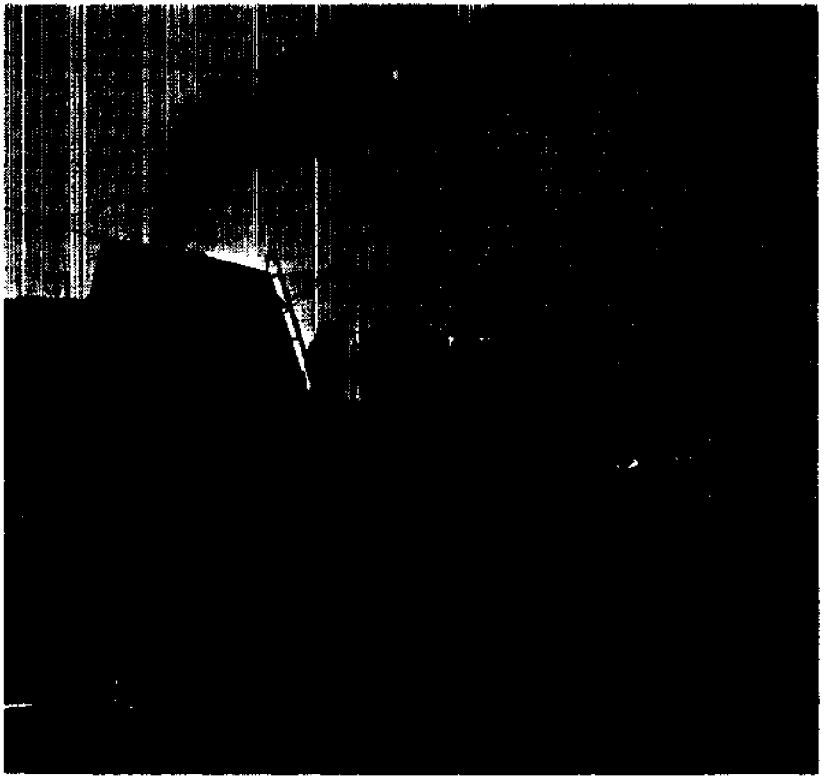
I think all of us, and especially the RFMCs and the states, must look ahead and begin exploring ways to manage those stocks which are multistate in migration routes but remain predominately within three miles of the coast--striped bass, bluefish, menhaden, and other species. We must begin considering the best way they can be managed, although they are basically outside the realm of the RFMCs. This is a good example of the importance and desirability of a strong state-federal program and how it can be used to improve the management of our fisheries. We are looking for meaningful input from interested parties so that we can begin seriously considering the best road to follow.

I am optimistic and excited about the future of US fisheries. We need to get more people--fishermen, processors, consumers, and legislators--at all levels more excited and enthusiastic about the great potential of our fisheries. We have made progress. We know the RFMCs are an effective mechanism, and we will see them become even more productive as the kinks are worked out of this very unique system of management.

All of us now have a shared goal--comprehensive fisheries management; a standard tool for achieving that management--fishery management plans; and an organizational partnership--the RFMCs--through which we not only will develop management plans but also will coordinate a wide array of management activities. We must get on with the job ahead, together.

Panel Presentation: The Effect of Extended Jurisdiction on Foreign Fisheries

Session Chairman: Donald L. McKernan



EFFECTS OF EXTENDED JURISDICTION ON JAPANESE FISHERIES

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Significance of Extended Jurisdiction to World Fisheries

The unilateral extension of jurisdiction over fisheries by the United States (US) and Canada in 1976 decisively affected the order of fisheries in the northern hemisphere, plunging those fisheries into tempest and turmoil. The impacts of those actions might well go beyond fisheries, since the nations--at least to the eyes of certain countries--worked to ascertain the claim of some delegations at the Law of the Sea (LOS) Conference of the United Nations (UN) that each sovereign state has the right to determine the extent of its jurisdiction. It also is quite ironical that such countries as Japan, the Soviet Union (USSR), and the European Community nations, which opposed the concept of the Exclusive Economic Zone (EEZ) at the outset of the UN conference, find themselves only a few years thereafter fighting most fiercely among themselves in the game in which they never wanted to play. The 200-mile fisheries zone is thus a *fait accompli*, and the traditional regime of the freedom of fishing is now almost dead insofar as the productive parts of the oceans or 95 percent of the oceans' productivity (excluding the Antarctic Ocean) is concerned.

In the speeches of the fervent advocates of the concept of the EEZ, the freedom of fishing was the root of all evil against the rational use of marine resources. Needless to say, what is central to the concept of freedom of the seas is the belief that all renewable natural resources of the sea are the common heritage of all mankind and that they should not be subjected to the exclusive control of any particular nations. Allowing less advantaged countries access to the food resources in the ocean has played a paramount role in counterbalancing the inequalities in the size of territorial land among different nations. The ocean always has been available to all nations that need to rely on that resource for food.

Thus, the following questions come to mind; first, what nations are principal beneficiaries of the new system? And, second, what benefit would they be able to bring to the rest of the world? With respect to the

first question--what countries are the principal beneficiaries--the following comparison of the size of the continental shelf and its dependent populations provides a reasonable key.

Country	Size of continental shelf as available per person m^2/person	Daily per capita intake of fish and fisheries products g of protein, 1972
Australia	156,793	1.7
New Zealand	74,058	1.2
Canada	43,351	2.5
Norway	39,863	7.3
Madagascar	33,871	2.5 (1970)
Chili	20,940	3.7 (1970)
Indonesia	11,666	3.5
US	8,365	2.5
Mexico	8,046	0.8 (1964-66)
USSR	7,033	3.0
Brazil	6,606	2.2 (1970)
Japan	2,226	17.1

One also would note that the most heavily populated countries in Asia and Africa gain little, if any, or lose as the world shifts into the new regime. These figures also clearly show the responsibilities of geographically advantaged countries. In contrast, it is obvious that none of the heavily populated countries in tropical Asia and Africa have anything to gain under the new regime, unless they are united to develop a means to use the resource jointly, thus doing away with the national boundaries at the sea.

The regime of 200-mile jurisdiction has been conceived as a supposedly better means to achieve conservation of the natural resources that is closely associated with the concept of the maximum sustainable use of the ocean resources. Although the concept of the EEZ places the interest of the coastal nation, with respect to the harvest of the resources, over and above the interests of other countries, the intent and purpose envisaged in the Informal Composite Negotiating Text (ICNT) of the LOS Conference quite clearly renounced arbitrary use or disuse of the resources lying within the zone of the coastal nation. The common property nature of the renewable natural resources was not lost in the concept of the EEZ.

As I indicated earlier, almost all the important fisheries resources are in the hands of a few nations. The responsibility to be borne by these nations with plentiful resources is thus unprecedentedly grave. It

is primarily their responsibility to prove that the new system is definitely a better and more equitable system than the old one in terms of the overall benefits to all human beings. Additionally, those nations which would have to suffer under the new regime have the legitimate right to expect implementation of the new system according to its original intent and purpose.

For fair and just implementation, the following points, among others, are indispensable:

1. There is no precise definition for optimum utilization in the provisions of the ICNT.

The definition, as given in the text, provides some degree of flexibility for the coastal nation to determine the level of production since it permits the coastal nation to take socioeconomic conditions into consideration. However, the language in the text clearly expects the catch level to be defined in close association with the maximum sustainable yield (MSY) of the resource (where the concept of MSY cannot be applied due to violent fluctuations in the year class size, suitable scientific criteria need to be established). An attempt, for example, to define the optimum yield (OY) as the current capability of harvest by the coastal nation contradicts the duty and responsibility of the coastal nation to the international community which requires the coastal nation to give other states access to the surplus of the allowable catch. Since the definition of OY is very basic to the 200-mile fisheries jurisdiction, one cannot stress too much that the definition should be clearly accountable in terms of the biological productivity of the resource.

2. Admittedly, the new regime does not necessarily require the coastal nation to apply the same regulations and restrictions to its own and foreign fishermen.

The coastal nation has obvious precedence over other nations in the allocation of the total allowable catch. However, the rule of fairness and consistency must apply to all the regulatory measures. As a matter of principle, no country would have difficulty in accepting such a norm. Yet, there is always a danger that such a norm would not be implemented. Although I shall refrain from citing such examples, it is the coastal nation's responsibility, particularly that nation with tremendous resources in its waters, to implement the new regime true to its original intent and purpose.

Effects of the 200-Mile Jurisdiction on Japanese Fisheries

Although the new regime of coastal nation jurisdiction will have far-reaching effects on the structure of Japanese fisheries as well as the food supply of our nation, it is still premature to assess the final outcome at this stage. However, certain features of such change already are evident.

Before entering substantive discussion on this subject, I would like to describe the general features of the Japanese fisheries, which are very often misunderstood.

First of all Japan, with 110 million people on land the size of the State of Montana, is basically a food-importing country. The self-sufficiency rate is just about 50 percent in terms of protein, carbohydrates, and fat. Japan is one of the largest buyers of wheat and other grains from North America. Fish and rice are the only exceptions, for which Japan is almost 100 percent self-sufficient.

The average Japanese consumes 17.1 grams of fish daily in terms of protein weight, or slightly over 50 percent of the total animal protein intake. European and North American countries, on the other hand, depend heavily upon cattle as a protein source. Daily consumption of fish per person is no more than 3 grams in terms of protein weight. Even the Norwegian per capita consumption is less than one-half of Japan's, or 7.3 grams.

The total fish catch by Japan in 1975 was 10.5 million metric tons, with 9.5 million metric tons being marine fisheries. This amount corresponds to about one-seventh of the world catch, which tends to create a false impression that the Japanese fleet has been overfishing the fish resources in every corner of the world's oceans.

The catch in Japanese home waters in 1975 was 5.5 million metric tons, which is just about the average historical level over the past 30 years. I should like to point out in this connection that 5.5 million metric tons are approximately equal to the total combined catches by US and international fleets in US waters, although the size of the continental shelf around Japan is only about 15 percent of that along the US coast.

Speaking of Japanese distant-water fisheries, the total catch made within 200 miles of other countries in 1975 was 3.7 million metric tons. Of this amount, US

and USSR zones accounted for 1.4 million metric tons each. The remaining 0.9 million metric tons came from China (152,000 metric tons), the Korean peninsula (241,000 metric tons), Canada (21,000 metric tons), Australia and New Zealand (92,000 metric tons), and other areas (432,000 metric tons).

The catch in the high seas outside the 200-mile limit from any coast was a mere 330,000 metric tons. This indicates the magnitude of productivity of the high seas relative to coastal waters.

Let us now turn to the trade in fisheries. Japan is the second largest importer of fish and fishery products, second only to the US. In 1976 Japan imported 810,000 metric tons of fish worth 1.9 billion US dollars. The export was 650,000 metric tons worth $720 million. During the same period, the US imported 1.1 million metric tons of fish and fishery products worth $2.2 billion. In return, the US exported 220,000 metric tons worth $380 million.

The major features of the Japanese fishery may be summarized as:

--Domestic fishery produces about 60 percent of total catch,

--North Pacific fishery off the coast of the US and the USSR represents approximately three-fourths of the Japanese catch made within 200 miles off the coasts of other countries, and

--Japan is the second largest fish-importing country in the world.

Now let us review what happened to the Japanese fishery during the past 12 months. The year 1977 was one of agony and consternation for the Japanese fishery, as a consequence of the institution of the 200-mile fishing zone by the USSR, the US, and Canada. Fortunately, other neighboring countries chose more moderate actions to adjust their fisheries regimes.

The negotiation with the USSR was particularly difficult. First, the USSR itself was the victim of the new regime, its overseas fisheries being reduced substantially. Second, the fisheries issue rekindled the fire over the disputes on the four islands in the southern Kurils. Pending the conclusion of this negotiation, Japanese boats fishing in the USSR zone were all ordered home in late March. They lay idle for the months of

April and May, leading to temporary closure of all activities related to the fishing industry.

The conclusion of bilateral agreements with the USSR and the US resulted in substantial reduction in the Japanese catch, that is, by approximately one-half a million metric tons or about 18 percent as compared with the 1976 catch. This reduction dealt a far more serious blow to the fishing industry than the figure indicates, since the Japanese industry was still recovering from the damage done by the "oil shock" in 1974. The industry also has suffered from the reduction of its catch quotas, which stemmed from the previous bilateral agreements with the same two nations. The catch in 1977 was down by about 1 million metric tons or almost 30 percent from the 1974 level.

Reduction in the catch hit hardest the economies of the coastal cities of Hokkaido and northern Honshu. The City of Kushiro, the largest fishing port in Hokkaido, was among the hardest hit. The city, with a population of 200,000, depends upon fisheries for 70 percent of its livelihood. The Japanese northern fishery is now in the process of reorganization. As a step, it has decided to reduce, with financial assistance from the government, the size of the fleet from 3,186 to 2,171 boats. That reduction is about 33 percent, which is equivalent to the reduction in catch over the past three years. Although some boats may find a new horizon in the new fishing grounds of the southern hemisphere, the bulk of the retired boats, with nowhere to go, are to be scrapped.

In assisting the industry to readjust itself to a new regime, the Japanese government also has decided to provide relief funds equivalent to $320 million from the 1977 budget. The bulk of this fund, $265 million, was earmarked as a subsidy to the industry for payment of separation allowances to fishermen. Scrapping disused boats, as mentioned earlier, will be a two-year process and $45 million will be given in subsidies to the boat owners. Reduction in fish landing is bound to affect adversely the processing plants in the area, so that a subsidy will be provided in the amount of $4 million for scrapped machinery. On top of the government relief scheme, the industry also has a plan for mutual aid, paying consolation monies to those who retire from the fishery.

The turmoil and tempest are just about over as far as this fishing season is concerned. However, the difficulties with the Japanese industry are bound to continue for some years to come. Naturally, such difficulties are

dependent mainly upon our future relations with the US and the USSR, whose coasts account for the overwhelming bulk of Japanese overseas fisheries.

Japan's relationship with these two nations is still far from stable. On the US side, some pressure appears to be gaining momentum toward attempting to exclude all foreign fisheries, even before the US fisheries can develop the capability to harvest all of the allowable catch. On the USSR side, its need for fish will continue to increase for years to come; hence there are few optimistic elements in sight toward mitigating the competition between Japanese and USSR fishing industries for the same resources.

Turning to the West, the time is not far off when China and other neighboring countries will go to the 200-mile regime. The People's Republic of Korea declared a 200-mile EEZ this summer; since that time there has been no Japanese fishing in its waters. The east China Sea and the Yellow Sea are the historical fishing grounds for our fishermen in western Japan, involving a great number of small boats and small processing plants.

Australia and New Zealand are scheduled to institute the 200-mile fisheries zone next April. Although both nations are believed to be prepared to have other countries continue to fish in their zones, New Zealand seems to be more interested in trying to solve the question of expanded export of meat and dairy products to Japan than initiating talks on arrangements for the continuation of Japanese fishing activities in their waters.

The question of highly migratory species is also a complicating element for our tuna fishing industry. The total catch of tuna in 1975 was about 600,000 metric tons or about 6 percent of the total Japanese catch. Value-wise, this fishery plays an important role in Japanese fisheries, contributing about 20 percent of its total production. We estimate that of this amount about 40 percent is caught within 200 miles of coastal nations. Although the quantity of Japanese catch in each of these nations is usually quite small, the number of nations involved is quite large, including many island countries in the South Pacific.

The world is not quite fully aware of the need for international management of highly migratory species. While some species of tuna, such as yellowfin tuna, are being quite heavily exploited and, while signs of over-investment already are evident, a great many countries still are planning to expand their fishing capabilities.

The world will have to face further serious problems with respect to the conservation and optimum utilization of these species in the not so distant future.

Highly migratory species are not limited to tuna. Billfishes and oceanic shark are just as highly migratory as tuna. It is inconsistent to seek the solution for tuna by renouncing the coastal jurisdiction, while rejecting the concept of international management for billfishes.

The foregoing outlines in general terms the effects or possible effects on Japanese fisheries with emphasis on our overseas fisheries. Japanese nationals are taking the present crisis in their fishing industry quite seriously, since self-sufficiency in food supply is basic to our sense of security.

The question of unemployment in fishing communities is a cause for serious social unrest regarding the slumping economy at present. People also are aware that a primary industry such as a fishery is hard to rebuild, once it falls.

Having said that, Japan is not quite pessimistic for the future of its fishing industry. It should be possible to find ways and means to maximize the use of our domestic resources, since a considerable portion of productive but low-priced fish--such as sardine and mackerel--are not fully used for direct human consumption. Japan has been expending various efforts in developing measures to utilize these species for direct human consumption--species for which other countries find no use other than conversion to fish meal. In certain areas large resources of these low-priced fish are still unexploited. It should be possible for Japan to utilize these resources, either singly or by joint effort with the coastal nations, should the resources be within 200 miles of such countries.

Roads may not be easy, but should not be impossible to pass.

THE ROLE OF DISTANT-WATER AND COASTAL FLEETS IN FISHERIES OF LOWER MARKET VALUE SPECIES WITHIN THE 200-MILE ECONOMIC ZONE WITH EMPHASIS ON ALASKA POLLOCK

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After implementation of the 200-mile economic zone, the United States (US) became the overseer of one of the largest coastal fisheries resources in the world. Part of these resources is already intensively exploited by the domestic fishermen who take all salmon species, shellfish, and some finfishes, such as halibut, haddock, Pacific Ocean perch, cod, and others. These fish are considered to be highly valuable species and have a high demand in the local consumption market. It also can be expected that in the future the fish products based on the above-mentioned species will find even stronger demand and, consequently, their prices could sustain further increases.

However, the US coastal waters are also abundant in species of lower market value, which are either partially utilized or not developed at all by the domestic fisheries. Such species as Alaska pollock, black cod, hake, Atka mackerel, and others have been harvested for many years exclusively by foreign distant-water fishing fleets. These fleets are able to catch the lower valued species, preserve or process them on board, and deliver them in large quantities to their home ports. Part of the catch is processed and shipped back to the US. For example, in 1976 the US imported Alaska pollock fillets frozen in blocks for a value of almost $20 million (U.S. Department of Commerce, 1977). Among the most important targets for the distant-water fishing fleets operating in the eastern Bering Sea and the Gulf of Alaska are the bottom sea resources, particularly Alaska pollock. According to Food and Agriculture Organization (FAO) of the United Nations sources, the total average yearly value of all demersal fish taken by foreign nations in northeast Pacific coastal US waters is about $400 million.

Extension of national jurisdiction over the coastal resources certainly will accelerate the development of underutilized species by local fishermen. It can be expected that in the long run these resources will be harvested principally by the US. This situation will be resolved through decisions intended to increase existing

fishing and processing potential, as well as to improve economic efficiency of these resources' utilization.

Full development of existing Alaska pollock resources in the eastern Bering Sea and the Gulf of Alaska can be realized through the expansion of large-scale specialized industrial trawl fisheries. This expansion will require the introduction of a new, economically optimal type of fishing vessel, as well as development of a land industry specialized in processing this species. Since there is no possibility of immediate development of these resources by the domestic fishing industry, perhaps the quickest way to enter into a large-scale Alaska pollock fishery would be the joint utilization of these resources by US and foreign fishermen. Some benefits and constraints of such cooperation are discussed here from both coastal and distant-water fishing nations' points of view.

Distribution and Utilization of Alaska Pollock Resources by Distant-Water Fishing Nations

Alaska pollock is widely distributed in shelf and upper slope waters (to 450 meters) from the southern coast of Korea northward into the Bering Sea and off the North American coast southward as far as California. In North American waters pollock are most abundant in the eastern Bering Sea. In that area the most important fishing grounds for Alaska pollock occur in waters south of a line joining Cape Navarin and St. Matthews Island (U.S. Department of Commerce, 1977), as illustrated in Figure 1.

Alaska pollock is the largest single-species fishery in the North Pacific and the second largest in the world (Low, 1976). Foreign nations, particularly Japan and the Soviet Union, developed Alaska pollock resources in the northeast Pacific Ocean 15 years ago, increasing their catches from 26,000 metric tons in 1960 to about 1.5 million metric tons in 1974 (Table 1). South Korea, Poland, and Taiwan recently have entered the exploitation of Alaska pollock fishing grounds, but their catches are still relatively low in volume.

As a starting point for the future economic importance of pollock as a resource, let us consider the total allowable catch (TAC) data for Alaska pollock in 1977 and 1978, as shown in Table 2.

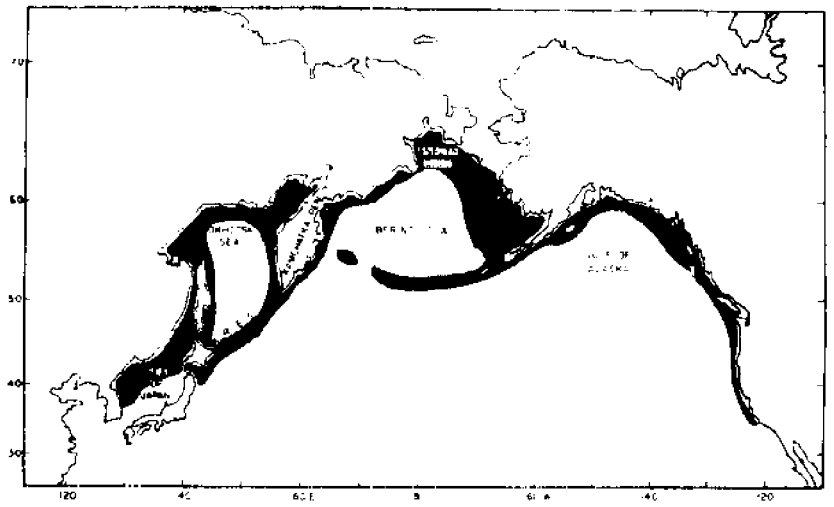

Figure 1. Distribution of pollock, Theragra chalcogramma, in the North Pacific Ocean

Table 1. Alaska pollock catches in the northeast Bering Sea and the Gulf of Alaska, 1960-1976, in thousands of metric tons

Country	1960	1970	1974	1975	1976
Japan[a]	26.1	1,241.7	1,122.0	1,049.0	1,000.0
USSR[b]	0.0	24.5	362.0	268.0	251.8
Total	26.1	1,266.2	1,484.0	1,317.0	1,251.8

SOURCE: [a]Suisan Tsushin, January 29, 1977, and Suisan Keizai Shimbun, January 31, 1977.

[b]The Fishermen's News, April, 1977, 2nd issue.

Table 2. Total allowable catch quotas for Alaska pollock during 1977 and 1978, in metric tons

Fisheries	1977	1978
Gulf of Alaska	150,000	169,000
Bering Sea and the Aleutians	950,000	850,000
Total	1,100,000	1,019,000

SOURCE: Report of US-Japan Meeting on Stock Conditions in the Northeastern Pacific Ocean, National Marine Fisheries Service, Seattle, Washington, July 14, 1977.

Only a small percentage of the volumes shown in Table 2 are actually taken by US fishermen. Domestic catch of Alaska pollock in 1977 is expected to reach only 1,000 metric tons in the Gulf of Alaska (National Marine Fisheries Service, 1977), while during 1978 it is expected to increase to 17,700 metric tons (North Pacific Marine Fisheries Commission, 1977). In the Bering Sea, domestic catch of Alaska pollock is nearly nonexistent.

Alaska pollock, unlike many other groundfish species, is a difficult fish to handle. It is subject to rapid deterioration and is difficult to process. These problems have been overcome by Japan, the USSR, and other distant-water fishing nations by means of rapid freezing within a few hours after the fish are caught. Rapid freezing is followed by storage at low temperature (-20°C). However, during long periods of cold storage (about six months), it has been proven that this fish deteriorates more rapidly than most other species, a characteristic that poses a serious problem from a quality standpoint.

The large factory trawlers, with on-board processing plants and freezing capacity, used by distant-water fishing nations are probably the principal factor in the successful development of Alaska pollock resources in US coastal waters. These nations were able to develop successfully their own processing technologies and to find multiple uses for this species in their home consumption markets. In Japan, Alaska pollock are utilized primarily as a raw material for the production of fish jelly, minced meat, fresh and cured products; while in the USSR, South Korea, and Poland pollock are used in the production of fillets frozen in blocks. The blocks frequently serve

as a raw material for canned and other prepared fish food products for local markets. A large percentage of the Alaska pollock catch is reduced for fish meal. Japanese factory trawlers were reducing nearly 50 percent of their Alaska pollock harvest for fish meal, while shore plants were reducing only 6 percent for fish meal. About 70 percent of the total catch was used for food purposes in 1970. The remainder was processed into fish meal used to feed poultry and fish (Okadu and Noguchi, 1974).

Economic Implications of Alternative Management Strategies for Species Underutilized by the United States

Harvesting Activities

If rationally managed by the coastal nation, Alaska pollock from the US 200-mile zone could support long-lasting fisheries on a large, commercial scale. After a certain period of rebuilding the stock, which has been overfished in many areas, it can be expected that an average of 1 million metric tons will be available annually for fishermen. In managing these resources the coastal nation is facing some alternatives related to allocation and utilization. The most important of these alternatives are:

1. Continuation of the current system based on quota allocations for foreign countries. In this case practically all of the harvestable stock of Alaska pollock would be handed over to other nations. The economic benefits generated by this management policy would depend on the license fees imposed on foreign fishing vessels scheduled for harvesting this species.

The poundage fee for 1978 is proposed at 3.5 percent of the 1976 ex-vessel price of fish. For species not landed in the US, prices would be based on landing prices in foreign countries.

Since there are no meaningful data on the cost of fishing by various foreign fleets, it is expected that during 1978 the same rate would be applied for Alaska pollock as in 1977, i.e., $45 per metric ton of fish. Assuming that during 1978 about 1 million metric tons of fish were taken by foreign nations, this would produce about $1.5 million for the US. We can also expect that the permit fee will be about $1.00 per gross registered ton per year for fishing vessels (with an upper limit of $5,000); 50¢ per gross registered ton per year for

processing vessels (with an upper limit of $2,500); and $200 for each support vessel. The Alaska pollock fishery can engage about 500 foreign fishing vessels, each averaging about 2,000 gross registered tons, for a total of about 1 million gross tons. The majority of these vessels will be equipped with processing installations on board. Based on these assumptions, one can expect that the US will receive approximately $1 million for license fees. Thus, the total amount of fees possible to collect by the US from foreign nations in the Alaska pollock fishery during 1978 is estimated to be approximately $2.5 million.

2. Prompt development of the domestic fishing effort for Alaska pollock with simultaneous expansion of the existing land processing capacity for this species. It is well known that the US consumption market for Alaska pollock is quite insufficient. There is still resistance to pollock product purchases in the US. This constraint, however, is related to numerous important factors.

The most important aspects of the problem are the capacity of the existing domestic fishing fleet to catch Alaska pollock, as well as its ability to preserve this species on board. According to surveys carried out by NORFISH, a program directed toward a total system quantitative approach to management of North Pacific coastal zone resources at the University of Washington, modern combination crabber-trawlers are the only class of vessel that can feasibly participate in the fishery (Bledsoe et al., 1977). The vessels are known to be of sufficient horsepower and size to harvest pollock via otter trawl. About 180 such vessels, principally designed for shellfish fisheries, operate in the Alaska region. This fleet is not fully utilized in its basic activities and consequently could catch Alaska pollock after the shellfish season is closed. This effort could bring about 60,000 metric tons of Alaska pollock with a net value of about $10 million (Bledsoe et al., 1977).

The above-mentioned numbers are obtained as a result of some simplifying assumptions, the most important of which is the expectation that shellfish skippers will enter the Alaska pollock fishery when their crab and shrimp seasons are completed. According to fish ticket landing data for 1974, some excess of fishing capacity exists in this fleet which if utilized would produce more than a thousand week unit trips for this species. However, according to Jaeger (1977), most of the existing fishing vessels' operating time in the Alaska region is rather fully utilized and, with the yet-unharvested

potential of other crab species and bottom fish of the Bering Sea, the current fleet obviously must be augmented in numbers to utilize fully this resource potential.

Another factor related to the Alaska pollock fishery is that the species deteriorates rapidly and has a very short shelf life in the hold compared to most other species. This will hinder considerably the exploitation of these resources by present domestic fishing vessels, which generally keep their catches on ice or in refrigerated seawater. Consequently, it probably will be necessary to design a new type of specialized trawler capable of keeping the fish in proper freezing temperatures and/or develop even some initial processing activities on board. During the last cooperative research of the Sea Fisheries Institute, Gdynia, Poland, and the National Marine Fisheries Service (NMFS), Seattle, Washington, held on board the Polish research vessel, Profesor Siedlecki, it was confirmed again that for practical purposes the storage life of Alaska pollock is extremely short, unless deeply frozen--no matter what kind of preserving media are used (Table 3). It is practically impossible to store the fresh fish on the deck or in the hold without chilling. Six hours after being caught the raw material will not be suitable for human consumption.

According to the data in Table 3, if existing vessels are to be engaged in the Alaska pollock fishery, the maximum storage time of fish should be shortened by at least 12 working hours. This time is necessary for handling in the harbor, transportation, and freezing or processing of the fish in the land processing plant. Consequently, the vessel can keep on board her first haul of fish: (1) in refrigerated seawater, 12 hours; (2) in flake ice, 36 hours; and (3) in slush ice, 84 hours.

If one assumes that the average coastal fishing vessel will spend about one-third of her time at sea for traveling purposes, then the range of operation from the base ports (for example, Dutch Harbor and Kodiak) would be limited to, respectively, (1) 4 hours of one-way trip, with 8 hours of harvesting activities; (2) 12 hours of one-way trip, with 24 hours of harvesting activities; and (3) 28 hours of one-way trip, with 56 hours of harvesting activities.

With an average speed of 10 knots, the vessel would be able to operate in the fishing grounds a distance of up to 40, 120, and 280 miles from her base port. This situation is illustrated in Figure 2. The figure includes many simplifications, but the general conclusion perhaps would be universal for this fishery. It can be

expressed as follows. Unless deep-freezing of fish is applied, all available preservation methods limit the geographical range of this fishery to one part of the existing Alaska pollock resource and to only partial utilization of its potential.

The foreign experience acquired during the past 15-year period of Alaska pollock harvesting activities indicates that the best way for assuring high quality of fish raw material for land-based processing plants is quick-freezing of fish immediately after they are hauled on board.

Table 3. Storage life of Alaska pollock for human consumption according to preserving method on board

Preserving method	Maximum storage time hr
Fish stored on the deck in a pen without any chilling media[a]	6
Fish stored in refrigerated seawater (RSW) at 0°C (32°F)	24
Fish stored in flake ice (equal proportions of fish to ice)	48
Fish stored in slush ice (or slush ice and CO_2)	96 (4 days)

SOURCE: "Preliminary Report, Gulf of Alaska Research Cruise of r/v Profesor Siedlecki, First and Second Leg," Fish Processing Technology Laboratory, July, 1977.

[a]The question is still open as to whether or not the fish stored for six hours on deck will be suitable for further processing, including subsequent freezing and the changes occurring in this process. This can be decided once all quality estimations are concluded after a six-month period of cold storage of fish.

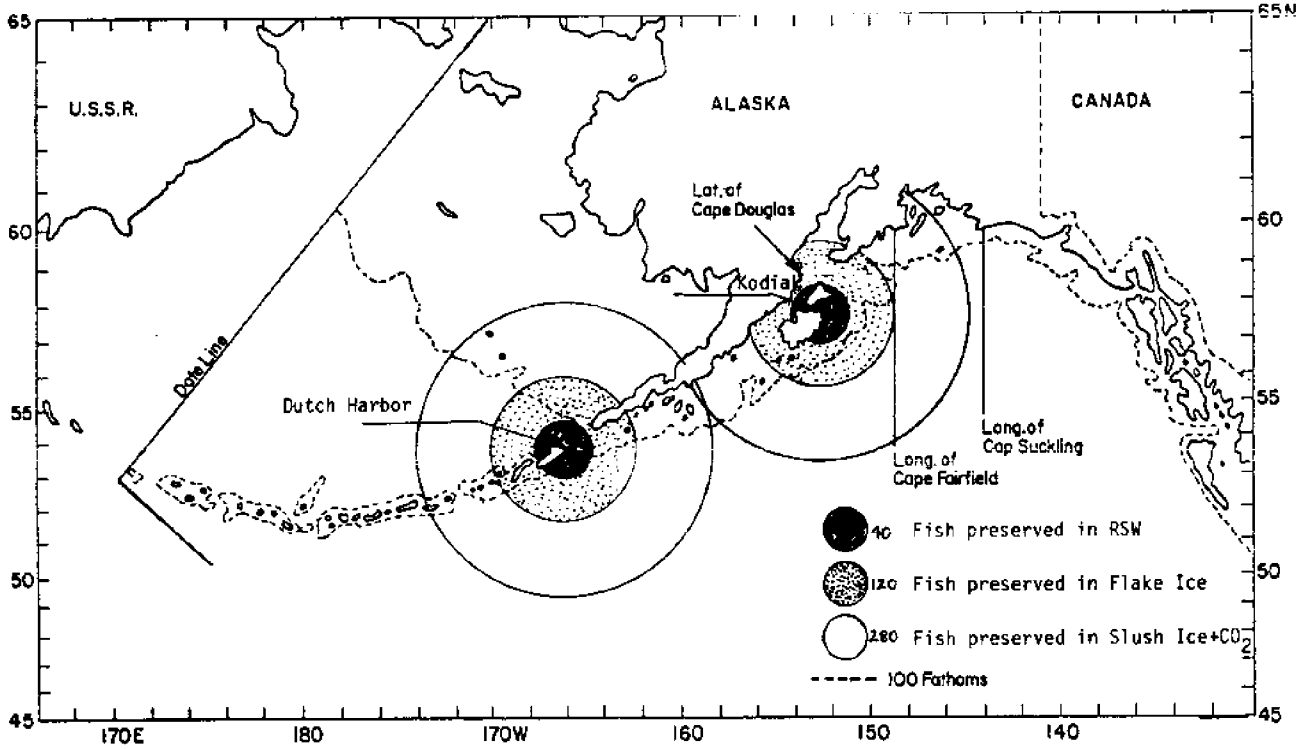

Figure 2. Operation ranges (in nautical miles) for the vessels engaged in Alaska pollock fisheries based on preservation method used onboard

Which would then be the most appropriate fishing vessel for the Alaska pollock domestic fishery?

--She would certainly be a medium-sized stern trawler of rather high seaworthiness, able to operate in icy conditions in order to assure her largest harvesting season and access to the northern portion of the northeastern Bering Sea. Stern trawlers can carry on harvesting activities in worse hydrometeorological conditions than other types of fishing vessels.

--The ship should have a relatively large hold capacity to enable her to handle the greatest volume of catch possible. This is due to the fact that Alaska pollock probably will maintain its low ex-vessel price. When harvesting low-value species, profits for the shipowners would be feasible only when massive catches were carried out.

--Freezing facilities for fish or, at worst, chilling installations would be required both to maintain the best quality of fish delivered to the processing plant and to increase the range of operation for the vessel.

--The main propulsion engine should develop the necessary power (probably over 1,000 hp) to assure rather high speed (particularly for vessels with only chilling facilities on board) and enable catching of fish in waters as deep as 400-500 meters or even more.

--All operations on board, particularly handling nets and caught fish, should be mechanized or automated to reduce as much as possible the number of crew members.

--If possible, to shorten her time at sea the vessel should be designed for continuous fishing with two interchangeable trawl nets.

Even this short review of the main characteristics for the future US fishing vessel designed for the Alaska pollock fishery indicates that its price can be rather high. It would be particularly important if the US were willing to change its laws prohibiting importation of fishing vessels.

It is strongly recommended that the Alaska pollock fishery should be carried out by a few, but large, specialized fishing companies that possibly would include

harvesting, processing, and marketing (exporting) activities. Any dissipation of the fishing effort among small, individual fishermen in harvesting these low-valued species would hardly be economically acceptable. Only large and financially strong owners would be able to develop the massive production process and perhaps maintain its satisfactory economic efficiency.

Processing and Marketing Aspects

The rapid development of the Alaska pollock domestic fishery should be closely interrelated with a simultaneous expansion of the land processing industry. Its location the shortest distance from the most abundant fishing grounds would reduce the time of transportation and preservation of fish on board the fishing vessels. Dutch Harbor seems to be the best existing base port for the Alaska pollock fishery both in the eastern Bering Sea and the Gulf of Alaska. Generally, the processing activities of Alaska pollock should be centered in the Alaska area. The physical properties of the Alaska pollock flesh, its quick deterioration after being extracted from the sea, and its frequent infestation with parasites require a very careful handling and processing technology. This undoubtedly would contribute to higher costs for the land processing plants.

The acceptance of Alaska pollock by the US comsumption market would be possible if the domestic industry were able to deliver this species with a high grade of processing and at competitive prices in relation to other groundfish-based products. This question was resolved in Japan by the invention of surimi-producing and fish jelly-producing technologies. There are many other examples where low-value species are successfully utilized as a raw material for such fish protein concentrates as fish flakes, fish sausages, and other products. In the US the last significant developments were the introduction of fish sticks and portions. According to NMFS researchers, even more product forms based on Alaska pollock as a raw material could be developed in the near future (National Marine Fisheries Service, 1974-1977). However, the existing fish processing industry on the northeast Pacific coasts of the US lacks sufficient capacity to absorb the massive supplies of Alaska pollock. The industry is oriented principally to processing such highly valuable fish and shellfish species as halibut, salmon, crab, or shrimp.

Lack of interest in the development of the processing potential for Alaska pollock is caused by low market prices for fish products prepared from this species, as

well as by the strong competition of other fish products, based particularly on cod and other species consumed in the US market. There is a close interrelationship between the prices of pollock and cod.

According to existing data about expected catch composition, we can assume fishing vessels operating in Alaska pollock fishing grounds would be able to bring to the harbor the following fish cargos: Alaska pollock, 65 percent; cod, 15 percent; flathead sole, 5 percent; rock sole, 5 percent; Rex sole, 5 percent; and other flat fish, 5 percent (National Marine Fisheries Service, 1977). As a result, the estimated price the fishermen could get on the local market would reflect a weighted average of prices applied for all species caught at the same time. To establish an average annual ex-vessel price for all the above-mentioned species, it was necessary to determine an actual price level for fish currently landed in the nearest harbors or consumption centers. Unfortunately, ex-vessel price notations for these species are scarce and incomplete. For example with Alaska pollock, it is practically impossible to estimate the average annual price free on board (FOB) at Alaskan harbors because this species is still not landed there for commercial purposes. The first ex-vessel price notations were given for the Seattle fish auction only in January, 1977. As for the remaining by-catch species, only cod prices are regularly registered in the Seattle fish terminal and from time to time in Kodiak, Alaska. Table 4 shows the price notations for 1976 and the beginning of 1977.

Due to the lack of price notations for flathead sole, this species was included in "other flat fishes" and consequently calculated weighted average price was for all sole species. Thus, the final estimation for ex-vessel price according to expected catch composition would be: Alaska pollock, 8.0¢/lb; cod, 13.2¢/lb; and flat fishes, 14.2¢/lb. It would be interesting to compare these prices with notations for pollock and cod species landed in Boston by large trawlers operating in the northwest Atlantic. According to Noetzel and Norton (1969), the average monthly ex-vessel prices for cod and pollock at the Boston fish pier in 1966 were as shown in Table 5.

The data in Tables 4 and 5 indicate that the interrelation between pollock and cod prices on the east and west coasts of the US was roughly similar. This important conclusion should, however, be confirmed with newer data related to the northwest Atlantic pollock landings and ex-vessel prices offered for both species discussed.

Table 4. Ex-vessel price notations in the Seattle fish terminal for Alaska pollock and by-catch species during 1976 and first quarter of 1977, round and iced

Species	1976 ¢/lb												1977 ¢/lb			Avg ex-vessel price ¢/lb
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	
Alaska pollock	--	--	--	--	--	--	--	--	--	--	--	--	8.0	8.0	--	8.0
Cod	11.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5[a]	12.5	12.5	13.8[a]	13.8	15.0	15.0	15.0	13.2
Flathead sole	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rock sole	--	19.0	19.0	19.0	19.0	19.0	--	19.0	19.0	--	--	20.9	--	--	--	19.7
Rex sole	16.0	13.0	13.0	13.0	13.0	13.0	--	19.0	19.0	--	13.0	--	--	15.0	--	14.9
Other flat fishes[b]	--	--	--	--	8.0	--	8.0	8.0	--	--	--	--	--	--	--	8.0

SOURCE: Fishery Market News, NMFS, Seattle, Washington. Weekly reports for 1976 and first quarter of 1977.

[a]At the Kodiak fish terminal the ex-vessel price for cod in the same month was 20¢/lb.

[b]Based on price given for flounder.

Table 5. Average monthly ex-vessel prices for cod and pollock at the Boston fish pier in 1966

Species	Month ¢/lb												Annual avg ¢/lb
	J	F	M	A	M	J	J	A	S	O	N	D	
Large cod[a]	15.84	10.54	9.90	9.30	7.15	9.25	10.06	9.02	11.24	12.17	11.30	11.61	10.33
Market cod[b]	17.46	13.21	11.52	10.56	7.45	9.91	11.60	9.94	11.72	12.36	12.43	12.61	11.33
Pollock	8.64	12.42	8.82	8.44	7.81	11.37	10.08	5.48	9.26	7.98	5.20	5.68	7.29

SOURCE: Noetzel, B. G., and V. J. Norton. Costs and Earnings in the Boston Large Trawler Fleet. Bull. 400, Department of Resource Economics, University of Rhode Island, Kingston, 1969.

[a]Large cod: 10-25 lb.

[b]Market cod: over 2.5-10 lb.

Taking into account the expected percentage of the individual species to be caught in the Alaska pollock fishery, the final ex-vessel price per pound of catch can now be estimated; that is,

Alaska pollock	0.65 lb x	8.0¢ =	5.20¢
Cod	0.15 lb x	13.2¢ =	1.98c
Flat fishes	0.20 lb x	14.2¢ =	2.84¢
Total	1.00 lb		= 10.02¢

We can assume then that the ex-vessel price which could be taken into consideration for the Alaska pollock fishery would be about 10¢ per pound or about $220 per metric ton of round fish, FOB Seattle, Washington. This price is, however, highly theoretical. It does not include such important factors as possible price variations related to volume of fish offered by fishermen, storage, processing, and transportation capacities as well as local market demand for fish products based on Alaska pollock as a substitute for other bottom fish products, particularly cod derivatives.

The Role of Distant-Water Fishing Fleets in the Development of Low-Value Species Within the United States 200-Mile Economic Zone

In spite of considerable efforts by the US to accelerate the exploitation of coastal marine living resources, a large part of those resources will remain unutilized by the local fishermen for many years to come. These resources are principally those of reduced internal demand and low market value. In the northeast Pacific, Alaska pollock, hake, Atka mackerel, or sablefish serve as examples. Lack of sufficient and adequate fishing potential, as well as nonexistent processing capacity for these species, are the most important obstacles to their rapid development by the domestic fishing industry. However, the most immediate factor influencing the expansion of low-value species utilization by the US is the lack of marketing opportunities for products based on low-value species. In the current situation, large-scale commercial fisheries based on these resources perhaps could be developed as a source of seafood products sold in foreign markets.

Implementation of the 200-mile exclusive economic zone (EEZ) will create additional export opportunities for coastal nations as a result of increasing world demand for fish products, as well as reduced harvesting possibilities of the distant-water fishing nations. In the short perspective, direct exportation by the US of

fish food products based on the low-value species probably will be hampered by price competition from low-cost fish-producing countries or payment difficulties on the part of potential importing nations. In this group distant-water fishing nations which traditionally harvest these species should be included in the first place. However, it should not be forgotten that distant-water fishing nations facing fishing restrictions of the coastal nations and hard currency outlays for imported fish products will do everything to find more economically feasible sources of fish supply. They will simply look for new fishing grounds and new species, even if that will be more expensive for their domestic economies. It will be possible for them to take such measures because of their largely developed harvesting potential, which is now endangered by partial unemployment or scrapping.

If we then confront the most immediate interests of both sides--coastal nations rich in low-value fishery resources and distant-water fishing countries--it is possible to present a comparative list of factors that should stimulate cooperative exploitation between coastal nations (CN) with 200-mile EEZs and distant-water fishing countries (DWF).

1. CN: Underutilized or partially exploited fisheries resources (mainly low-value species).

   DWF: Lacking or reduced coastal fisheries resources.

2. CN: Weak or nonexistent domestic demand for fish products derived from low-value species.

   DWF: Traditionally high consumption of fish products (Japan, South Korea, etc.) or strong market for fish food as a result of internal agricultural production difficulties (Soviet bloc countries).

3. CN: Insufficient harvesting and processing potential.

   DWF: Distant-water fishing fleets with factory trawlers and mother ships designed for immediate processing on board.

4. CN: Lack of experience and technology among local fishing industries in massive utilization of low-value species for human consumption.

   DWF: Extensive experience with harvesting know-how and processing technology in preservation and distribution.

5. CN: Temporary lack of larger economic benefits for existing fishing industry if engaged in low-value species fisheries.

   DWF: Massive fisheries know-how, lower manpower costs (Japan, South Korea, Taiwan), or strong state subsidizing policy (Soviet bloc countries).

It should also be taken into consideration that the same fish species in various countries have different market values. This is illustrated in Table 6.

Table 6. Ex-vessel price comparison for round Alaska pollock and cod in selected countries

Country	Ex-vessel price (in local currency)	
	Pollock	Cod
US ($/lb)	8¢	16¢-18¢
USSR (rubels/kg)[a]	0.20-0.30	0.30-0.35
Poland (zloties/kg)[a]	2.50-3.10	2.50-3.10

SOURCE: US: this paper; USSR: personal communication of Dr. Sergei Doroshov, College of Fisheries, University of Washington; Poland: "Uklad Zbiorowy Dla Rybakow Marskich [Working Contract for Sea Fishermen]," No. 42, Warsaw, January, 1975.

[a]Ex-vessel prices are fixed by the government and do not necessarily reflect the real market value of fish landed.

While the ex-vessel price of Alaska pollock in the US is far below the price of cod, in Soviet bloc countries this difference is negligible or does not even exist. There are more examples with other species and countries supporting the concept of uneven demand and price levels for the same species. Consequently, it is to be expected that distant-water fishing nations will be highly interested in harvesting those stocks which in the US are not developed by the local fishermen.

Distant-water fishing countries are developing intensive efforts to establish numerous joint ventures in fisheries with US partners. Particular emphasis is being placed on underutilized and low market value species. On the northeast Pacific coasts of the US, Alaska pollock and hake are principally taken as target species. Joint ventures are considered by these nations as a way of attenuating the restrictions imposed by the coastal nations on volume of fish to be taken by foreign fishing fleets operating within the 200-mile EEZ.

For the coastal nation, the joint venture concept deserves careful consideration as a way of quick development of its own harvesting and processing potential. Perhaps the most attractive incentive for US partners is the opportunity to export coastal resources which otherwise would hardly find their way to the foreign markets. In cooperative fishing activities with distant-water factory trawlers and mother ships, coastal fishermen can better utilize their existing fishing fleets and harvest the resources which, being too far from base ports, would be inaccessible for them. In the longer perspective, joint venture may serve as a vehicle to independent utilization of underutilized resources by the coastal nations.

One of the principal conditions determining international joint venture operations is the political and social climate existing in the potential host country. Fisheries activities, if they are to be developed by international companies, should be planned for rather longer periods of time, thus guaranteeing return of invested capital for both sides. In the case of the US, we observe some interest in joint exploitation of selected coastal resources, but it is based on short-term policies influenced by the strong pressures of the local fishing communities. They generally reject broad cooperational links with foreign distant-water fishing nations, while some favorable exceptions are stipulated only on an interim basis.

For the US it is perhaps true that joint ventures will not be the only and the best long-run solution in

the development of underutilized species within its 200-mile zone. However, in the shorter perspective, joint utilization of these resources with distant-water fishing nations should be considered as an interesting way for gradually changing resource exploitation patterns imposed by the 200-mile EEZ system.

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DISCUSSION SESSION

McKERNAN: A very interesting presentation. I would point out two very important suggestions that were made in a very polite yet pointed and authoritative way. In the first place, Dr. Kaczynski has recommended that perhaps we can change our laws with respect to the importation of fishing vessels--a hot political subject in the United States (US), of course. The second point he made is one that has been before a number of the Regional Fishery Management Councils (RFMCs). That is the question of so-called "joint ventures." In this case, two are under consideration on the Pacific coast. The Soviet Union (USSR) and Bellingham Cold Storage have formed a joint company--a joint venture. According to the proposal, the USSR would bring a factory ship in close to the Washington, Oregon, and California coasts. United States flag fishermen would catch Pacific hake and sell them to the processing plants of the Soviet Union. The fish would be processed, probably into frozen blocks, then passed

through a foreign port and back into the US fish block market--one of the very largest markets for imported fish in the US. In Alaska, Koreans have come in with a joint venture somewhat similar. They also would bring a mother ship into the Gulf of Alaska, using a smaller, less experienced trawl fleet of US vessels to fish for Alaska pollock. And here the Korean mother ship would process the pollock into blocks and ship them back to Korea, where they again would be shipped to the US for processing into various fish products.

So far the Pacific Fishery Management Council and the North Pacific Fishery Management Council have turned down these two proposed joint ventures. However, both have indicated that these proposals are still on the table and will be considered further during the coming year. There have been public hearings. Opinions run very heatedly on both sides, with US processors, aware of their own supplies from the US fishermen, generally opposed to this kind of development. Some fishermen oppose it; some fishermen favor it. The RFMCs at the present time are taking a "wait and see" posture, trying to feel out, measure, and evaluate all the effects. At least Dr. Kaczynski, a resource economist himself, suggests this as a way to provide a transition from foreign fishing. At the present time the USSR, off the Pacific Northwest coast, for example, has authority to take approximately 150,000 tons--maybe somewhat less than that--of Pacific hake. They are taking them now with their catcher vessels, processing them aboard their ships, and eventually sending some of these into the American market. Or at least they would hope to.

Now, I would like very much to introduce Dr. Michael Shepard, Director of International Fishery Policy in Canada.

SHEPARD: I had originally intended to talk about the Canadian experience in extended jurisdiction. I also wanted to talk about Canadian-US relationships. Since there will be a paper on our experience in extension of jurisdiction in the proceedings, I would like to concentrate on the latter subject.

I think the US has to cooperate with Canada in fisheries. We share continental shelves; the stocks of fish cross any boundaries that we may eventually develop. And, on both sides of the line we have the power to wipe the other fellow out. So I think cooperation must be the focus of our relationship in the future. We have a long history of cooperation both bilaterally and multilaterally. Fisheries was the subject of agreements between

Her Royal Britannic Majesty and the US before Canada came on its own, and before the turn of the century. Canada and the US pioneered cooperative management of fisheries resources forming the International Pacific Halibut Commission and the International Pacific Salmon Fisheries Commission earlier in the century. And it is always pointed out in Canada that the convention that led to the formation of the Halibut Commission was the first treaty that Canada negotiated and concluded in her own right. I think that for fisheries to have that place in Canadian-US history is significant.

We have worked together in the International Commission for North Atlantic Fisheries and the International North Pacific Fisheries Commission and, at least with respect to fisheries, have worked together in the Law of the Sea negotiations at the United Nations. Nevertheless, our relationship also has been characterized at times by underlying currents of bitterness. We are neighbors and, considering the common threads of our backgrounds, we are almost family. Sometimes, rows within the neighborhood or within the family are more spectacular and emotional than conflict on a broader level. Therefore, perhaps it is understandable that neighbors will squabble more, but when the chips are down and external forces threaten the family or the neighborhood, we always pull together. Most differences we ever had bilaterally, in any event, focused on the age-old problem of too many boats chasing too few fish. Often the reason for there being too few fish was not the making of either country. But the fact remains that resources decrease, fishermen's incomes diminish, and it is only human nature to be bitter and to search out those who have offended you. Sometimes we choose the wrong target.

Both countries have just been through a period of drastic resource decline and feelings of bitterness still run high--bitterness about administrations that acted on both sides with too little and too late; bitterness about other third countries which, in the view of some anyway, have created our problem; bitterness about the activity of our neighbors with whom we must compete for scarce resources. Sometimes, such feelings of bitterness are spilled over into our diplomatic relations. One of my American friends, from the Atlantic coast, told me that there are three classes of foreigners. In order of the ascending scale of dislike, they are first of all, all countries other than Canada--they are the ones that are disliked least; the second one is Canada; and the third is the employees of the US State Department. So, typically, Canada is in a middle position, even with respect to the extent that she is disliked by her neighbor.

Canada and the US have a rather unique relationship that has sometimes been strained. But frankly, I am sick and tired of chauvinism. I think that the 200-mile zone provides us with an opportunity to overcome the basic causes of the decline of the resources. And, if we act wisely and resolutely on both sides to rebuild the stocks, to get together, we can have one of the richest areas of the world with respect to fisheries. The potential is tremendous to benefit not only ourselves, but the world as a whole.

However, the first year of our 200-mile zones has created immense challenges for both of us. We have come to realize that the 200-mile zone is not a pot of gold at the end of the rainbow. We have demonstrated within both our countries that we have the ability to despoil our own resources and that is not a prerogative of anonymous third countries. I believe it has been pointed out in papers today that there are imperfections in our management schemes on both sides, and I emphasize that Canada is not immune from this kind of irresponsibility. To make sure the pot of gold becomes full will require new levels of management and discipline within both countries. On both sides, we have to develop new approaches. The formation of RFMCs in the US is a response to this need. I congratulate the US for its action--an action that was urgently required for effective cooperation between differing jurisdictions and between different user groups. I believe that this is a very effective way of facing the problems that were created by the new management demands. Whereas Canada does not have as many jurisdictional problems as the US because the federal has the complete authority for the fisheries, we have a similar challenge. And we have greatly expanded our efforts to coordinate administration between researchers and those who manage our fisheries, and systematize the provision of advice for user groups.

However, I think that this first year both sides have been preoccupied with developing these new management tools and with satisfying the appetites of our fishermen, who have long been deprived by our resource shortages. Therefore, I think that this has been the preoccupation of both sides. Also, the new 200-mile zone provides a great variety of options for future development of our fisheries--options we have not had before. Within the industries on both sides, I believe, there is a very serious and deep review of past policies and a look to the future to see which way we are going--to take into account the new realities and the world that will exist 20 years from now. It is not perhaps unnatural in this regard that both sides have been selfish in their

first year of extended jurisdiction. This, perhaps, has closed the eyes of both sides to opportunities for future cooperation.

We have listened to suggestions of joint ventures as a way of developing our fisheries. We have been talking between Canada and the US of future bilateral agreements, but perhaps both sides have not had time really to consider the opportunities that can be provided through cooperation with other countries, both bilaterally between ourselves or with third countries.

I do not think this is an error of commission; I think it may be an error of omission because essentially we have had to devote our efforts to getting our houses in order. I think we have a very good example of this in Pacific salmon. This is perhaps not a matter of burning interest to this group here, but I thought that it might indicate an area where we might have sought a solution through international cooperation to a problem that the one side addressed through actions within its own mechanisms.

I was disappointed this morning in Robert W. Schoning's (Director, National Marine Fisheries Service) remarks, in which he talked with satisfaction about the action of the Pacific Fishery Management Council (PFMC) regarding the regulation of the ocean trawl fishery for Pacific salmon. He talked of the extensive consultations held within the US with various user groups. He talked also of the relationship between the PFMC's work and that of court decisions made in the US. He did not mention that Canada had made the strongest representations to the US regarding action taken by the PFMC which affected Canadian fishermen fishing off the coast of Washington. Yet Canada operates a fishery off its own coast which intercepts thousands of salmon bound for US rivers. Canada is convinced that many of the problems faced by the PFMC could have been solved by assuring more effective cooperation with Canada which would provide for improvement in the management of the stocks and the number of fish available to US fishermen.

I am not raising this problem in a critical sense. Indeed, in recent weeks, intergovernmental meetings, including members of the PFMC on the US side,have been very encouraging and we believe that we have the kernel of cooperation with the US--the actual people who do the management at hand. The reason I raise it is that I feel there is an important gap in the relations between our two countries, and it is essential that any agreement reached must provide for a working contact between people

on both sides of the line who set policies and who address the very practical day-to-day problems of fisheries management. It is all very well to have diplomats on both sides of the line talking about day-to-day relations, but I suspect that, aside from the occasional dipping into caviar at cocktail parties, perhaps they have not had very much contact with fish. I think that on the US side the RFMCs are the logical partners for Canada to seek for our management people. We, therefore, will be looking in the long term to the formation of a Canadian-US relationship, perhaps in the form of a commission in which RFMCs will form a vital segment of the US side. We are convinced that bringing such people together from both sides will provide a basis for cooperation. We believe we must cooperate.

We have four common maritime boundaries, all of which still remain unsettled and which subject I do not care to get into today. However, on all four boundaries, fish stocks cross back and forth and, for many stocks, one country or the other might fish them out. It is obvious therefore that we must approach the management of such stocks jointly. It is the only way that maximum benefits can be gained from the stocks. Therefore, we think that this is the key element that must be addressed on both sides. Also, both of us have fisheries operating clearly off the coast of the other country, which both wish to continue. Both of us have technical skills that can be helpful in the development of fisheries on both sides.

We look forward to a future when surely our joint objective must be to assure that the common continental shelf off our coast that God wrought without concern for boundary lines should provide maximum harvest. If agreements are reached that do not result in maximum production, then surely we will have failed our peoples and indeed the world. We are committed to such cooperation and know from our contacts with US negotiators that our commitment is shared.

McKERNAN: Thank you. I think Dr. Shepard's experience in this field and the suggestions he makes ought to be considered by government and RFMC members alike on this part of the line. I would like to open up the subject for discussion from the floor.

QUESTION: In using US vessels for fishing, foreign vessels for processing, and then going into a foreign port, can that be a function of a free trade port? Are you familiar with that?

McKERNAN: I doubt very much that this could be the subject of a free trade port according to our law. It is my understanding of the legality--and I am not a lawyer, so forgive me if I am wrong--that foreign nations would have to transport the processed fish through another foreign port. For example, either the USSR or Poland or another foreign country such as Korea could process the fish on the high seas beyond three miles--I remind you that our territorial sea is three miles. They could land those fish in Canada or Mexico, then transport them into the US.

COMMENT: I would like to suggest that someone investigate this. It could be a function of a foreign trade center in connection with a port of entry in the US because foreign corporations can bring products in and either process them or store them and not pay customs until they enter the trade of the US or they can take them out to another country.

McKERNAN: Yes, in this case they can be brought in, bonded, and held here; but they cannot enter the US market unless they have been landed in a foreign port.

QUESTION: Can the suggestions by Dr. Shepard be used by RFMCs joining other countries?

McKERNAN: Yes, I expect that Dr. Shepard's point could well be taken by the Gulf States Regional Fishery Management Council, the Caribbean Council, and even perhaps some of the other RFMCs as well; that is, Councils developing fishery management plans involving fishermen, stocks of fish that are trans-boundary with our neighbors to the south. There is a problem there also.

QUESTION: Is it possible to put foreign fishermen on US flag vessels?

McKERNAN: This has been done in two ways so far. In terms of the joint ventures I mentioned earlier using US flag vessels, both the USSR and the Republic of Korea have suggested putting experts on our flag vessels--gear technologists, for example--to transfer some of the technologies that the fishermen from those countries are using in catching Alaska pollock and Pacific hake. Keep in mind that we do not on the Pacific coast catch either of these species very effectively or efficiently or in any great quantity. Now, in terms of the processing itself, we do have joint ventures inshore for processing here in the US. For many years, for example, there have been Canadian joint ventures. The technology has been transferred quite readily and rapidly across the borders.

But more recently, the Japanese have sent in technologists especially prepared to handle, for example, herring roe and salmon roe, and other specialty products--many others in internal waters of the US. So that kind of technology does occur at the present time.

QUESTION: How is Canada dealing with the question of joint ventures? I know that they have some rather complicated arrangement. I believe they are much further along in this enterprise than we are.

SHEPARD: I have been very interested in this discussion because that is one of the things I came to find out about. Progress is being made in the development of thinking about this situation in the US. For the past three years we have had a very restricted policy on so-called joint ventures. Indeed, we have no joint ventures at all. The only arrangements we have are arrangements wherein Canadian concerns charter foreign vessels with their crews and the foreign vessels land their catches in Canada. There are one or two arrangements where Canadian fishermen deliver to the foreign processing vessels within Canadian waters.

Our policy is currently under review. We have quite a number of these short-term arrangements underway this year. Our experience with them has been mixed. We have had some excellent arrangements. The objective of all of them is to contribute to the development of Canadian harvesting capacity. Perhaps the best example is Capeland. There is a resource of approximately a million tons off the coast of Newfoundland. Canada has taken very little of this, but countries such as the USSR and others have taken very large quantities. We, over the past three years, have had an arrangement whereby the Norwegians and the Icelanders have Canadian observers aboard and land their fish in Canada. They are processed there. We used the advice of these countries on how to process them and this has given our processors experience in processing and marketing that is now giving them confidence that we can have a Canadian industry. And for the first time this year, we have had Canadian vessels in the fishery, and we expect expansion over the years. So this has been a very useful tool. We have had very valuable--and I hope Poland feels the same way--arrangements with Poland along the same lines. And so we are using this as an experiment to see how we can get into these fields. But I would say that our policy is under review and in question. Whether we go into more long-range arrangements is still open to question.

COMMENT: Under the documentation laws of the US, only a vessel documented in the US is privileged to engage in American fisheries. It is not exactly clear what this privilege encompasses. One thing it certainly encompasses is the privilege to land fish in the US. Only a documented vessel can off-load fish in the US, and this also includes foreign trade zones. The current laws also prohibit the Spanish catches of squid off the coast of the US and processing them here. We have tried to change the laws or interpret them in a different way to allow some of these types of ventures. But, at the present time, foreign vessels cannot off-load their catch or anybody else's catch directly into the US.

THE CANADIAN EXPERIENCE WITH EXTENDED FISHERIES JURISDICTION

M. P. Shepard
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Canada has long been a firm supporter of international cooperation in fisheries management. In the 1930s Canada and the United States (US) concluded agreements for the cooperative management of Pacific halibut in the northeastern Pacific and for salmon of the Fraser River. Since then Canada has concluded more than 20 multilateral or bilateral conventions or other types of agreements with cooperation as the keystone of most.

Why Did Canada Extend Fisheries Jurisdiction?

In the 1960s the explosive worldwide demand for fish products and the development of increasingly sophisticated fishing technology created severe threats to the well-being of fish stocks off the Canadian coast and reduced the opportunities of Canadian fishermen to harvest the resources at their doorstep. Despite valiant and sincere efforts and innovative approaches never before adopted by international fisheries organizations (e.g., national allocation of quotas), the expansion of offshore fisheries outstripped the ability of such organizations as the International Commission for the Northwest Atlantic Fisheries (ICNAF) and the International North Pacific Fisheries Commission (INPFC) to provide for effective management. These commissions found it impossible to reconcile the interests of coastal and distant-water fish-

ing nations. Too often the need to reach consensus resulted in conservation measures that were not stringent enough to prevent deterioration of the stocks. Nevertheless, ICNAF performed better than comparable organizations in other parts of the world and, while failing to prevent resource depletion, at least stopped the build-up of fishing effort at a point where the basic nucleus for stock restoration was maintained. With careful management recovery likely will occur within a decade.

The experience in the northwest Atlantic was repeated in other parts of the world, and often the extent of resource depletion was worse. The theory that the resources of the sea are limitless repeatedly has been disproved. This realization, coupled with a lack of truly effective international management, was a major factor leading to the convening of the Third United Nations Conference on Law of the Sea (LOS) in 1974.

During four sessions of the LOS Conference (the latest concluding in New York in July, 1977), Canada and other coastal nations pressed strongly for according to coastal nations the right to act as the stewards of the living resources within an exclusive economic zone (EEZ) of 200 miles from their coasts. Within such zones the coastal nation would have the right and the obligation to manage fisheries; in return it would be able to reserve for coastal fishermen portions of total allowable catches (TACs) equivalent to their harvesting capacity. This concept received overwhelming support with the LOS Conference and, although a final convention has yet to be concluded, there is little question that a consensus has been reached among the nations of the world that the 200-mile EEZ will be an essential element of a worldwide accord on fisheries management.

Steps in Extension of Jurisdiction

In 1975 the worsening plight of Canadian fisheries and the likelihood of further stock declines convinced the Canadian government that it could not wait for the outcome of the LOS Conference to take action to provide for more effective management of fisheries off the Canadian coast. As a consequence, Canada conducted bilateral negotiations with the major fishing nations which accounted for over 80 percent of the foreign catch off the Canadian coast. From December, 1975, through June, 1976, five bilateral agreements (Norway, Poland, USSR, Spain, and Portugal) were concluded in anticipation of Canadian extension of jurisdiction. The agreements,

which were consistent with the consensus emerging from the LOS, provided for Canada's management of the living resources off its coasts, and for access to the future Canadian zone for vessels of its bilateral partners to take portions of TACs in excess of the harvesting capacity of Canadian fishermen. The agreements also provided for consultations on allocations of surpluses, for future economic cooperation, and for guarantees of access to Canadian ports. The agreements did not touch on the "how and when" of Canadian extension of jurisdiction--in essence they provided a de facto and not de jure acceptance of Canada's intentions to extend its fisheries limits seaward.

In June, 1976, immediately before the 1976 annual meeting of ICNAF, Canadian Minister of Fisheries Romeo LeBlanc announced Canada's intention to extend its fisheries jurisdiction to 200 miles for 1977. Earlier, the US and Mexico had made similar announcements. The 1976 ICNAF meeting therefore was held against a background of certainty with respect to Canada's intentions. At the June meeting and at a follow-up meeting in Tenerife in December, ICNAF agreed to much more stringent conservation regulations and to increased proportional shares for Canadian fishermen for the 1977 season.

During the latter half of 1976, Canada made intensive preparations for extension of jurisdiction. Based on allocations agreed to in ICNAF, bilateral consultations were held with every nation fishing off Canada's coasts with respect to their fishing plans. On the basis of these consultations, each country was informed of the numbers of its vessels that would be granted access to the Canadian zone and the regulations that would be applied to them (e.g., seasons, areas, and catch reporting requirements).

A sophisticated computer system ("FLASH") was developed for monitoring foreign catches and licensing data. All foreign vessels would be required to carry licenses; to report on entering or leaving the zone; to make regular reports on vessel position, fishing effort, and catches; and to collect biological information on catches. Cross-referencing between data collected and the terms of licenses in the computer would provide immediate intelligence on whether or not each vessel was fishing in conformity with the conditions set forth in its license.

Through cooperation between the Department of Fisheries and Environment and the Canadian Armed Forces, arrangements were made to increase the surveillance of foreign fleets in 1977 so that it would be possible

for aircraft to check all major fisheries approximately once a week and for surface vessels to inspect approximately one-third of all foreign vessels in the Canadian zone each month. Such coverage required a doubling of surveillance activity over that applied in 1976. During the year of transition, Canada indicated that it would levy no fees, although it also indicated that fees would be imposed in 1978 and succeeding years.

Foreign fishing vessels began entering Canadian ports near the end of 1976 to obtain licenses. To facilitate issuance of licenses and compliance of foreign vessels to Canadian regulations, nations fishing on a substantial scale off the Canadian coast were required to appoint designated officials in Canada who could act as liaison between the Canadian administration and the foreign fleets at sea.

On January 1, 1977, Canada took the final step by promulgating an Order-in-Council that extended Canada's existing fisheries waters from 12 miles (plus such special bodies of water as the Gulf of St. Lawrence on the Atlantic and Queen Charlotte Sound on the Pacific) to 200 miles. Unlike the situation prevailing in a number of other countries (e.g., the US), Canada required no special legislation to extend its limits. The Canadian Coastal Fisheries Protection Act (CCFPA) already provided for establishment of fishing zones; all that was needed was an order to change the limits of the zone. Under Canada's basic Fisheries Act, a series of regulations were promulgated for foreign fishing vessels to give effect to quota allocations and other control measures. The authority for issuing licenses was provided by the CCFPA.

On January 1, 1977, a special communications link was established between Ottawa and regional enforcement operations to deal with special problems that might arise on the first day of the new regime. It is worthy of note that not a single call was made--all foreign vessels observed were operating in conformity with Canadian law.

At time of writing, the 1977 fishing season is approaching its end. The year of transition was a smooth one, with all nations cooperating fully with Canadian authorities. Canada applied its regulations and licensing system with flexibility, making changes when unexpected events altered fishing plans. The designated officials of other countries in Canada worked hard to minimize difficulties and to iron out problems. Only 10 vessels out of the total of over 600 licenses were charged with violations. Canadian fishermen already are begin-

ning to benefit from the new regime. To provide for more effective conservation, TACs of such traditional species as cod and flounder were reduced by approximately 30 percent.

Almost all of the reduction was borne by the foreign fleets. Canada reserved for its own fishermen virtually all of the TACs of such species on grounds traditionally fished by Canadian fishermen, leaving the foreign fleets fishing stocks in more remote areas or species not of traditional interest to Canada. Canada increased its share of the TAC from approximately 25 percent to over 40 percent.

For 1978, further improvements are expected. In connection with the 1977 annual meeting of ICNAF (which established regulatory measures for stocks beyond 200 miles in 1978), Canada convened an intergovernmental meeting to consult with nations fishing off its coasts. Following the consultations, Canada indicated to the meeting the TACs and allocations that would apply within the Canadian zone in 1978. Again, TACs were decreased for a number of stocks to accelerate their rebuilding. The combined total of fish reserved by Canada for stocks of its 200-mile zone, plus Canadian allocations for stocks beyond the 200-mile zone, will give Canadian fishermen 80,000 more tons of catch than they have in 1977. This total includes an additional 50,000 tons of groundfish, mainly cod and redfish which are species of special importance to Canadian fishermen. This figure represents an increase of 23 percent over the 1977 level. To accommodate the need for more stringent conservation measures and increased Canadian requirements, allocations to other nations for groundfish stocks dropped by 24 percent.

An important feature of the 1977 season was the interest shown by overseas nations in cooperative fishing arrangements with Canadian firms. In the past Canada prohibited landings of foreign-caught fish except in a few cases where such landings were conducted in conjunction with exploratory fishing operations in which Canadian fishermen participated to learn new techniques. Current Canadian government policy is still "go slow," and still is limited to cases where such combined operations would contribute to the eventual development of Canadian fishing capacity.

No joint capital investments are permitted and all arrangements are limited to one year. Despite these restrictions, at least six such experiments have proceeded in 1977, including operations on shrimp, capelin, cod in remote waters of Labrador, squid, and silver hake--

species or stocks hitherto not extensively utilized by Canadian fishermen. Catches made under such arrangements come from the portions of TACs reserved by Canada. The experiments are providing valuable information that will contribute significantly to planning Canada's future fishing fleet development.

Whereas the basics of Canada's new fishing scheme are in place, important negotiations still lie ahead. In 1976 both Canada and the US focused their attention on the seaward extension of their fishing zones and negotiations with third countries, leaving the question of lateral demarcation between Canadian and US fishing aside. The two countries negotiated an interim agreement for 1977 that permitted access for fishermen of each country to the zone of the other to engage in fisheries of traditional interest. The interim agreement also provided for special arrangements in boundary areas where the declared zones of the two countries overlap. During 1977, the two countries are finally approaching the problem of negotiation of the lateral boundaries separating their respective fishing zones and of complementary fisheries arrangements. Such arrangements must take into account the fact that many stocks extend between the zones of the two countries, which creates a need for cooperative management. The negotiations also are addressing the question of access to be provided for fishermen of one country fishing in the zone of the other. Four boundary areas are involved (the Gulf of Maine, the Beaufort Sea, Juan de Fuca Strait, and Dixon Entrance). Negotiations are extremely complicated, but are proceeding with a sense of urgency to provide a basis for fisheries relations between the two countries in 1978. Negotiations also are underway with respect to a new multilateral arrangement to replace ICNAF, taking into account the continuing need for management cooperation beyond 200 miles and for continued scientific cooperation throughout the northwest Atlantic.

Summary

Faced with increasingly rapid declines in stocks off its coast, which had particularly severe effects on coastal fishermen, Canada announced in 1976 that it would extend its fisheries jurisdiction to 200 miles in 1977. This announcement was preceeded by bilateral negotiations leading to agreements with the major nations fishing off the Canadian coast. The agreements anticipated extension of Canadian jurisdiction and outlined the management responsibilities of the coastal nation and the general terms and conditions for access of Canada's bilateral partners to fish for portions of TACs surplus to Canadian

harvesting capacity. The terms of these agreements were consistent with the consensus developing within the Third LOS Conference. Within ICNAF, with the background of Canada's announcement of its intention to extend its fisheries jurisdiction, Canada negotiated marked improvements in the conservation regime for stocks off Canada's Atlantic coast and reserved increased proportions of TACs for Canadian fishermen in 1977. The negotiations led to a series of allocations to each country fishing off Canada's coast for 1977.

Implementation of the new jurisdiction has gone smoothly as the result of intensive consultations on fishing plans with overseas nations, a flexible licensing system, and facilitation of licensing and control through the presence of designated officials of major distant-water fishing nations in Canadian ports. Canada looks forward to gradual improvement in the stocks over the next decade, with Canada taking an increasing share as its harvesting capacity expands. Currently, Canada takes approximately one-half the groundfish catch off its Atlantic coast--this compares with less than 25 percent two years ago. In spite of the anticipated expansion of Canadian activities, surpluses likely will continue to be available for some years to come, especially for species not fished traditionally by Canada. And for such stocks, Canada is gaining experience through cooperative developmental arrangements that utilize foreign vessels on a charter basis, and expects to develop new fisheries of its own for such hitherto underutilized species.

MEXICO'S NEW FISHING DEPARTMENT, THE EXCLUSIVE ECONOMIC ZONE, AND THE ESTABLISHMENT OF A WORLD FISHING BANK[1]

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Government of Mexico

I would like to convey to you a cordial greeting from Fernando Rafful Miguel, head of the Fishing Department of Mexico, who had to decline the invitation to be

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[1]This paper was prepared for the conference; however, due to unforeseen circumstances the author was unable to attend.

with you today, because he is accompanying the President of Mexico, José López Portillo, on his official visit to Spain. I also would like to emphasize that, although I am an official of the Mexican Fishing Department, my participation here today is strictly on a personal basis. Therefore, my comments do not have an official character and do not necessarily reflect the position of Mexico's Fishing Department or of the Mexican government.

Mexico's New Fishing Department

The Fishing Department is a new organ of Mexico's public administration. Created in December, 1976, in compliance with the Organic Act of the Federal Public Administration, its establishment responds to a double purpose marked by the President of Mexico. Under his administration, an important administrative reform has been undertaken to organize the administrative apparatus of Mexico, injecting into it higher efficiency and a profound restructuring of its functions. So, the administration now can respond to the new challenges, needs, and interests of Mexico--which, along with most countries in the world, is faced with financial problems of an international nature.

Regarding the utilization of its marine resources, one of the most acute problems from which Mexico suffered during the past two decades was the fragmentation of ocean issues among a very large number of government offices. This bureaucratic dispersion resulted in a limited budget, a duplication of effort and programs, and institutional rivalries. The new Fishing Department now centralizes all the functions directed to the utilization of the living resources of the sea, with only one budget designed to take into account the specific objectives and goals in each program. The Mexican Fishing Department has 16 offices, including Aquaculture, Fishing Regions, Infrastructure, Fishing Technology, Cooperatives and Training, and the National Fishing Institute, and has the legal category of a Secretariat of State--that is, a ministerial level. The Fishing Department encompasses the functions that formerly were distributed among the Ministry of Water Resources, the Ministry of Industry and Commerce, the Ministry of Agrarian Reform, as well as a number of autonomous secondary institutions (known as fideicomisos) created to implement a diversity of specific programs regarding aquatic fauna.

Mexico's Exclusive Economic Zone

Establishment of the new Fishing Department underlines the importance that President López Portillo gives to Mexico's abundant marine resources. As is well known, Mexico has 10,000 kilometers of coastline, situated in one of the most productive fishing areas of the world. It also has over 1 million hectares of coastal lagoons and estuarine areas that are ideally suited for aquaculture activities. Mexico's continental shelf has an area of approximately 0.5 million square kilometers where important commercial fisheries--such as shrimp, lobster, abalone, red snapper, oyster, squid, shark, and octopus--can be found, not to mention large oil deposits that have aroused the interest of both the government and the oil industry of this country.

To the previously mentioned maritime spaces one must add 2.5 million square kilometers, which is the oceanic area covered by Mexico's exclusive economic zone (EEZ) along its coastlines in the Pacific Ocean, the Gulf of California, the Gulf of Mexico, and the Caribbean Sea.

All of this indicates clearly that Mexico, because of its geography and privileged location, is naturally an oceanic country. Or, rather, that Mexico should be a marine country--a country of fishermen. However, until now, it has not been. The creation of the Fishing Department, establishment of the 200 nautical mile EEZ, and the recent publication of Mexico's National Fishery Development Plan: 1977-1982 make evident that the rational utilization of marine resources constitutes one of the highest priorities of Mexico's current administration. It is parallel in importance to the energy program and the program to fight unemployment.

On September 1, 1977, in his first presidential message, President López Portillo asserted before the Mexican Congress that "the sea has not been sufficiently utilized and, for that reason, has not been authentically ours. To the extent that we exploit and conserve this source of wealth, we shall be ensuring food for the Mexican people, in addition to generating jobs and obtaining exports. We are determined to achieve an increase of 7.5 percent in this year's catches, to reach a total of over half a million tons of fish."

Among the most important goals contained in the National Fishing Development Plan, to be accomplished by 1982, are:

--The total production volume will be increased by 361 percent to expand from 525,000 tons to 2.4 million tons, representing an annual average increase of 29 percent. The value of this production, at current prices, would be 39 billion pesos (23 pesos = 1 American dollar), more than triple the current figure.

--Catches for human consumption in Mexico's internal market will grow from 229,000 tons to 894,000 tons, for an overall increase of 291 percent. This will allow a per capita consumption of 12 kilograms (which is close to the current world average) in comparison with the current less than 4 kilograms.

--The export production, including production for industrial uses, will increase from 98,000 tons to 842,000 tons, representing a 760 percent overall increase and a 43 percent annual increase. In other words, fishing activities in Mexico will produce about $1 billion (US dollars) by 1982, compared with the current $350 million.

--Catches for industrial uses in the internal market will grow from 198,000 tons to 684,000 tons. Production value will be 1.55 billion pesos, thus replacing imports and satisfying the fish meal demand.

--The development of aquaculture activities will be of great significance, with a production of 666,000 tons. To achieve this goal, in addition to commercial activities, 24 aquaculture centers will be established, as well as 42 intensive cultivation farms of high-value species. One hundred pilot projects will be promoted in all the different states of Mexico.

--Direct employment generated by fishing activities will double, with the opening of 113,000 jobs. Aquaculture will be the major contributing activity, with almost 56,000 jobs.

--Finally, the National Fishing Development Plan will require a minimum overall investment on the order of 29.4 billion pesos, divided into the following areas: fleet, 11.9; aquaculture, 5.4; infrastructure, 4.0; industrialization, 3.3; transport and commercialization, 3.2; and the rest for scientific research and training.

The government of Mexico in general and the Fishing Department in particular realize that the goals established for 1982 are indeed ambitious; however, the strategies to reach those goals are clearly articulated in the National Fishing Development Plan. Furthermore, Mexico is not alone in this undertaking. We enjoy the support of all the countries to whom Mexico offers its friendship, as well as the backing of a number of international organizations.

Up to now Mexico has signed two fishing agreements--one with Cuba on July 26, 1976; the other with the United States (US) on November 24, 1976. These agreements allow the participating countries to fish for certain species within Mexico's 200-mile EEZ in the Gulf of Mexico. These bilateral agreements maintain a close relation with the results that have been produced so far by the Third United Nations Conference on the Law of the Sea (LOS), especially regarding the principle of optimum utilization of living resources. This principle states that if a coastal nation does not have sufficient or adequate means to manage the totality of the living resources offshore and to utilize the available catch, it should allow the fishing fleets of friendly foreign countries to do so. Otherwise, those living resources would be wasted. On the other hand, this same principle includes the coastal nation's right to utilize, for the benefit of its nationals, the allowable catch of the living resources offshore, when such nation has the human resources, the programs, and the financial and technological means for that purpose.

Following this philosophy, the two bilateral agreements signed by Mexico have expressly stipulated that, with respect to the shrimp in the Gulf of Mexico, Mexico will allow Cuba and the US to continue fishing for shrimp until December 31, 1979. After that date (namely, January 1, 1980) Mexico will take the available catch of shrimp production off the Mexican coasts in both the Gulf of Mexico and the Pacific Ocean. I would like to emphasize that this is one of the firmest objectives in the current foreign policy of President López Portillo, which also is shared by Fernando Rafful Miguel, head of the Fishing Department, and Santiago Roel, Secretary for Foreign Affairs.

Given the high priority the Mexican government places on the development of all the fishing activities, I am pleased to point out that on August 26, 1977, Mexico and the US signed a bilateral agreement. For the first time in its history Mexican vessels will undertake fishing activities within the US fishery conservation zone

(FCZ) for certain species, such as squid, hake, cod, and pollock. So this fishing agreement--which we expect to be approved very soon by the Congress of this country--establishes a new era of friendship and cooperation in the long diplomatic relations between Mexico and the US.

Any fishing development policy must be founded on very solid financial bases. Therefore, it would be pertinent to mention that only for the implementation of the fleet program, Mexico's public and private sectors already have agreed to invest close to 1.4 billion pesos to increase, diversify, and modernize Mexico's fishing fleet. In addition, the Mexican government already has invested over 1.5 billion pesos in fishing infrastructure works. This should give some idea of the enormous economic potential which the variety of activities and industries connected with the utilization of the living marine resources has in Mexico.

To accelerate our industrial fishing development, Mexico is considering receiving external financing, especially from those countries with which Mexico has maintained close commercial relations, or with those other countries which have made outstanding achievements in the fishing industrial or technological areas. As is known, Mexico has one of the most explicit laws on this continent regarding foreign investments and, given the high priority recognized for the fishing sector, I personally believe that the establishment of joint ventures with our friends offers one of the most suitable means to achieve the goals established.

Need to Create an International Organization to Finance Fishing Projects in Developing Countries ("World Fishing Bank")

Currently, the world is having very serious economic and financial problems. Although this crisis is affecting both rich and poor countries, the poor ones obviously are suffering the most negative effect. On the other hand, the Third United Nations LOS Conference presented the concept of a 200-mile EEZ. Unilateral implementation of this concept by many nations already is causing a profound impact in the world's fishing industry. It would seem that on one side one can find all the major fishing powers--powerful from the point of view of their industrial complexes and advanced technology, with large, modern, and efficient fishing fleets. And on the other side one finds the poor countries, without fleets or technology, but with abundant marine resources along their coasts.

One might ask this question: What is the use for a country whose oceanic area could cover millions of square kilometers to establish a 200-mile fishing zone or EEZ if that country does not have adequate means to exploit the marine resources in that vast maritime area? In other words, the developing countries should have adequate financial means so that the vast economic zones established along their coasts will not be a mere juridical concept that will serve only to enrich the legal dictionaries. Therefore, it is indispensable for those developing countries to have available sufficient capital and other financial means that will allow them to utilize--not in a theoretical, but in a real way--those new oceanic spaces.

For this capital and other financial means to be effective, a number of essential prerequisites must exist, such as the formulation of a national fishing development plan, adequate infrastructure, incentives and guarantees for the foreign investor, and sufficient numbers of human resources, among others. In general terms, such financial means can be divided into three categories--national financial means, foreign capital, and support from international organizations.

Since I personally think this is a new topic, the last part of this presentation will be devoted to evaluating--even in a very cursory manner--the role that international financial organizations have played in the past 15 years in promoting the development of fishing projects in developing countries. Although it may sound a little drastic, I am obliged to assert that financial support to stimulate the development of fishing projects in the countries of the Third World has been nil from the International Bank for Reconstruction and Development (IBRD) and the Inter-American Development Bank (IDB)--the two major international financial organizations in the world today. Apparently, both the IBRD and the IDB do not recognize the high priority that should and must be given to all programs directly connected with the utilization of marine resources. This institutional attitude, which in part denotes a divorce between the interests and needs that prevail in most developing countries and the rigid institutional policies followed by those financial organizations, should be corrected.

Based on statistical information, until now the IBRD has financed projects totaling approximately $37.9 billion. Of this figure, a relatively insignificant part--namely, $110 million, has gone to marine development projects. This $110 million is equivalent to only 0.29 percent of the total figure. During the past 15 years, the IDB

financed projects totaling approximately $10.2 billion. Out of this figure, a minimal part--$91 million, equivalent to 0.9 percent of the total--was devoted to marine projects. As the statistics show, during the past 15 years, out of the total figure used for financing hundreds of projects, the IBRD and the IDB allocated less than 1 percent to marine development projects. It should be added--even if it is a little disappointing or painful--that, of the minimum number of projects financed by those two banks, not all were successful, if one takes into account the small amounts involved or the fragmentary or isolated character of each project.

I believe that this situation must be changed. To do this, we propose three alternatives: (1) establishment of an international financial organization to encourage and finance marine development projects only; (2) adoption of a more aggressive policy by both the IBRD and the IDB that should give priority to those projects associated with the development of marine resources; or (3) the creation of International Research Centers for the Utilization of Marine Resources.

1. Establishment of an international financial organization to encourage and finance marine development projects only.

In general, these projects could be directed to the development and utilization of marine resources or, more specifically, to the development of fishing activities. In other words, this institution would be like a World Fishing Bank.

2. Adoption of a more aggressive policy by both the IBRD and the IDB that should give priority to those projects associated with the development of marine resources.

I think that under the category of "Agriculture and Livestock," both the IBRD and the IDB should devote around 30 percent of the financing given to the support of projects directed to the utilization of marine resources. By the way, I would also like to suggest to those banks that they should establish a special category--under the title of "Marine Development Projects" or "Fishing Projects"--to enlist precisely those projects. Now, a researcher has to devote a lot of time and and effort to find out if any of those international organizations financed a marine project, because such projects are thrown into the very large category of "Agriculture and Livestock" without any further detail.

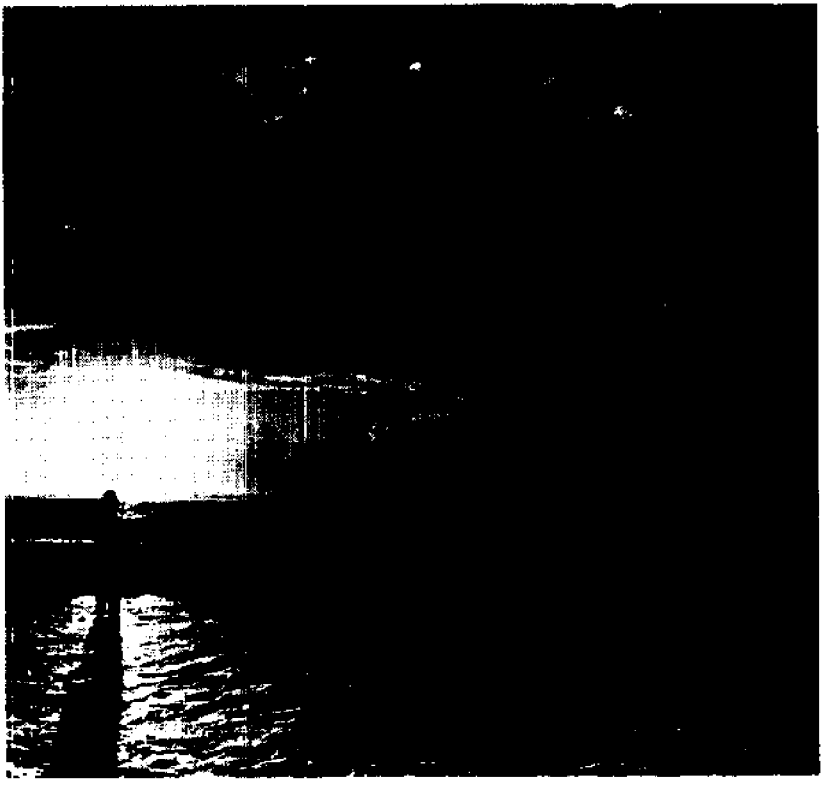
3. We should think about the creation of International Research Centers for the Utilization of Marine Resources.

The proposed International Research Centers for the Utilization of Marine Resources should be located in strategic places around the world. At the centers experts and well-known scientists from different countries would undertake research activities (especially of an applied nature) directed to the utilization of certain marine species. These centers should parallel examples given mostly in the agricultural sector, e.g., the International Center for the Improvement of Maize and Wheat, the International Center on Rice, etc. Furthermore, these International Marine Centers should be established under the aegis of the United Nations, particularly the Food and Agriculture Organization. The centers should have the financial support of other international organizations, such as the IBRD and the IDB, including participation by the official sector of the interested countries, as well as financial backing from certain foundations, such as the Rockefeller Foundation, the Ford Foundation, and the International Science Foundation. I am convinced that one of these International Marine Centers--where man may find a more brilliant path into his future--could be ideally located in the Gulf of California.

I have dedicated the past 10 years of my life to emphasizing the importance of the oceans and their resources to the future of mankind, since I am convinced that the marine environment offers viable solutions to man's most dramatic problems, i.e., food, space, energy, and pollution. I sincerely believe that Mexico is called upon to take a decisive step in the direction of utilizing in a rational way its marine resources, since it is by nature an oceanic country.

Summary and Outlook

Spencer Apollonio



SUMMARY REMARKS

Spencer Apollonio
Executive Director
New England Fishery Management Council

While listening to the papers that have been delivered over these two days, I was struck by a number of impressions--perhaps somewhat random impressions--that I might share with you before making summary comments. I was impressed, first, by the fact that North Carolina's Governor James B. Hunt is himself a resource economist. It seems to me that is largely the "name of the game" in the new fisheries management regime under the name of optimum yield (OY). It was pointed out on a number of occasions that OY is no longer a question of biological management--pure and simple--as perhaps it was at some distant time in the past. We now are much concerned with management of people and with the impact of management on people. From many aspects--socially, economically, locally, regionally, nationally, internationally--economic research will play a most significant role in management activities. It is therefore particularly appropriate that this is, in fact, The Governor's Conference on Fishery Management Under Extended Jurisdiction.

I was struck by the priorities that two Regional Fishery Management Councils (RFMCs) have established in developing fishery management plans (FMPs). The North Pacific Fishery Management Council, not surprisingly perhaps, undertook a plan for a fishery--the Gulf of Alaska groundfish fishery--which has had a great deal of foreign fishing pressure in recent years, but which also has been increasingly fished in the past few years by United States (US) fishermen. In striking contrast to that, the Mid-Atlantic Fishery Management Council (MAFMC) chose as its highest priority a species--the surf clam--which, as Dr. Laurence McHugh pointed out, was and is exclusively a domestic fishery. It is a fishery that coincidentally passed the currently recommended maximum sustainable yield (MSY) of roughly 300 million pounds a year at just about the same time--perhaps almost the same year--that the foreign fishing fleet first appeared in significant numbers off the northeastern coast of the US. And during this period of the past 13 or 14 years, which culminated in passage of the Fishery Conservation and Management Act (FCMA), the domestic surf clam fishery arrived at its present depleted and overcapitalized circumstances. While our attention was focused on foreigners, we found ourselves in the position that the domestic surf clam fishery de-

manded the highest priority for immediate remedial action by the MAFMC.

I was struck by a possibly outrageous suggestion that the RFMCs might be nothing more than a rubber stamp of the Department of Commerce--outrageous, with the presence of people like Harold Lokken and Laurence McHugh speaking before this conference and being leaders of two of the RFMCs.

I was struck by rather common, widespread agreement among the speakers concerning the issues that we are faced with: agreement on the question of resource allocation, for example, which I will go into in greater detail a little later; allocation among various user groups--how to share finite resources equitably among users who are increasing in numbers and increasing in demands; agreement on the need for better data of all kinds, not only biological data--which we traditionally have supplied with rather good ability--but also economic data--of which we are quite short--and for sociological data--which in many cases is practically nonexistent; agreement upon the need for a definition of OY that can serve as a relatively standard guide to the development of FMPs and to the effective implementation of the FCMA. And quite optimistically, there was generally common agreement that the FCMA, implemented through the RFMCs, will work. I did not detect, and I suspect it does not exist at this time, any serious concern that the FCMA will not accomplish its purpose in one way or another.

I was struck by some of the things that were not said during this conference. Specifically, as I recall the FCMA after several readings, nowhere does it say the US owns the fish in the Fishery Conservation Zone (FCZ). I think that is an important point. It is important to bear in mind. It has many significant ramifications.

The discussions seemed to cover nearly every conceivable aspect of both the consequences and the complications of extended jurisdiction. That being the case, I am somewhat at a loss whether it is possible to summarize in a few minutes the scope and implications of those discussions. I am sure that there were aspects of the presentations that impressed you differently from me. Possibly this is a result of different perspectives, different personal experiences, and different prejudices that we each may bring to this conference; thus your summary might be quite different from mine. But, in spite of these random impressions, in spite of the broad range of the topics covered, in spite of the different perceptions or impressions you may have, it is my job to try to summarize it. I am sustained in the undertaking of this obligation by the observation of the eminent Dr. Jonson who noted, pos-

sibly 200 years ago, that the prospect of being hanged imminently focuses one's mind wonderfully.

The FCMA is indeed radical. It has been pointed out several times that it is a "new" form of government. Nowhere else have we been able to identify a comparable form of government or a comparable form of fisheries management. We enter, in fact, into an entirely new regime with entirely new, untried systems and tests. We might ask what brought us to the condition that invoked such a radical innovation in the management of any kind of natural resource. I will put the burden on our neighbors to the north (and I am not referring to Virginia) to try to explain how we got to the position we are in now:

> All vicissitudes with which the fishing industry has had to contend might well be summarized under the rubric of . . . "fish or no fish." The circumstance is one that will not surprise anyone who is even remotely aware of what has been happening in the Northwest Atlantic in the past three decades. The profligate, if not actually criminal, manner in which we have permitted depletion of what ought to be an infinitely renewable resource will probably rank as one of the great asininities of the twentieth century. While such intemporate language might be considered inappropriate to a dispassionate and sober board of conciliation, it is difficult to be restrained in the face of potential ecological disaster which is not only predictable but which is preventable.

That is from the Report of the Canadian Conciliation Board for 1974. I find it particularly appropriate that it is in the language of the Conciliation Board.

One thing that is often overlooked in trying to assess what has happened to fisheries management is how rapidly change has occurred. I am continually impressed with the fact that it is less than 15 years that we have had any significant foreign fisheries problem off the US coast, and probably off Canada also. That problem developed, peaked, and has gone away, for all practical purposes, in 15 years. In the same time, the problem invoked and we are now implementing a totally new approach to the international policy of management of the resources of the sea and to management of domestic resources. All within 15 years! This is truly an amazing situation. I think that the rapidity and magnitude of the change have caused us to lose sight of what was happening prior to the arrival of foreign fishing fleets off the US coast. We have very short memories, perhaps, and do not easily recall the state of fisheries resources at that time.

Many people are still not aware of what actually happened with foreign fishing off this coast, and many are still not aware of the RFMCs themselves nor of the responsibilities of the RFMCs, nor what the legal requirements of the FCMA may be. The rapidity of change of actual circumstances has outstripped comprehension of why these things came about or the circumstances that led to this new regime. There is clearly an information gap in many areas that may alter both the effectiveness of the FCMA and the operations of the RFMCs. A great deal of work is yet to be done to overcome that gap, which is serious enough to influence the full implementation of the FCMA. And I would repeat, one of the things that is not generally appreciated: the FCMA neither says anywhere nor does it imply that the US owns the fish in the FCZ.

Clearly, what is implied within the FCMA is the concept of a trusteeship. We have the right to harvest the fish preferentially, and also the obligation to conserve and manage those fish--but not exclusively for our own use. We have a relation of trusteeship to all possible users or to those who may need the resources. We are guided in this trusteeship by the concept of OY--a concept that is still undefined in spite of the best efforts of many people who have given it a great deal of thought and effort.

That being the case--that being the indefinite status of the concept of OY which underlies the entire approach to management of these resources--we should not be surprised that the FCMA may be less than perfect. We should perhaps not expect perfection in an act that is less than 18 months old and that, for all practical purposes, is less than 6 months old. In that expectation we can be reasonably confident. Perfection at this point does not exist. The job is to try to make the FCMA, with all its imperfections and which must cover such a divergent range of fisheries interests and fisheries problems, work in such a way as to meet the intent of the Congress and US obligations on the international scene. These discussions clearly were designed to help make it work. The papers that have been presented are, if I may stretch an analogy a bit, somewhat like deep-sea minerals--there is great wealth down there. At this point it may be somewhat buried by a sea of paper, but wealth is undeniably contained in those papers. Like minerals, we are not quite sure how to harvest them--to make them work--for the benefit of all mankind. I would urge that you read the papers because there are many points in them that bear reflection and contemplation. I urge you to read

them all. With that comment I somewhat avoid my responsibility to summarize them all.

The FCMA very clearly does one thing--it focuses attention upon and forces the RFMCs and other responsible agencies to deal with problems that until now have been avoided. Many problems have been avoided or ignored simply for lack of authority of jurisdiction to deal with them. The authority, the jurisdiction, the responsibility to deal with these problems are now in hand. One of the obligations is, at last, to define the objectives of fisheries management. This is probably the single most important responsibility for any of the RFMCs. Clearly, when a finite resource exists that is subject to demands by probably more users than can be accommodated by the resource, it becomes important to define the objectives of the management of that resource. This probably will be a most difficult task for the RFMCs to assume. We are not used to thinking in terms of objectives for the management of resources as large, for example, as the cod resource of the Northwest Atlantic. It will be difficult for RFMCs to do this effectively, but it must be done for a number of reasons. One is because management objectives underly the whole concept of allocation of resources. Another is that those objectives really define data needs. The data required for a plan cannot be determined until one has identified what the plan is to accomplish.

The question of data needs is a broad one that has many ramifications. It seems to me in listening to the speakers for the past two days that we must try to understand better the full impact of the FCMA throughout the world. Clearly, the extension of fisheries jurisdiction is now changing, and will continue to change for a considerable time, the way the world as a whole does business in fish--whether it is in harvesting, marketing, selling, or trading fish. I am not sure it is possible to predict the outcome of all of these adjustments, but it is clear that adjustments of profound magnitude are going to take place. These adjustments, as they occur, must be understood by the RFMCs if they are to do their work properly for the US fishing industry as a whole. We must understand how the fish trade works in particular countries. This was brought out very clearly in the discussions on joint ventures and on the possibility of developing fisheries for low-value species of fish. Without understanding how the fish business actually works throughout the world, we are handicapped in trying to define OY and to predict the impacts--as we must by

law predict the impacts--of FMPs. We must identify adequately the impacts on domestic user groups, as well as on those beyond the sea. These are all requirements for better data than are readily available and data in forms that are readily understood by those who now have to make management decisions.

Associated with data needs is a great need to explain the nature, the objectives, and the limitations of scientific data and research to the fisheries industry, particularly to fishermen on boats. It was mentioned that there is a credibility gap between scientists and fishermen. Obviously, plans of the magnitude and the significance of the type being discussed simply will not be accepted unless the underlying scientific premises are both understood and accepted by the people who are affected by recommendations derived from research. We have a great deal of educating to do if the industry is to have confidence in the advice provided by the scientists and if limitations on that advice are to be recognized and incorporated in FMPs.

Another aspect of scientific data that should be kept in mind is that obviously the best available must be used, recognizing that in many cases the best is neither very good nor very adequate--but still it must be used. And the RFMCs must anticipate an argument that has merit; namely, if the data are not very good, "if you don't know much about my industry, then leave my industry alone."

The comment has been made that a conservative approach should be taken to management of fisheries resources in the absence of, or in the case of inadequate scientific data. Exactly the opposite argument has been and will be made that if the data are not very good, you do not have to be conservative--you can go right up to the upper limit of whatever the data suggest. I am not saying that is a legitimate argument, but I am saying that the argument is being made, will be made, and must be anticipated; and the RFMCs must have an effective response to it.

Joint ventures were implicit and explicit in several of the papers presented here. Generally speaking, joint ventures are held in disrepute in the US. We have heard enough discussion in these two days to suggest that possibly we should look very carefully, very critically, at the possibility of joint ventures. It may very well be that our hopes, our expectations of developing low-value fisheries that the US has not traditionally used will not be possible without some kind of cooperative venture.

There is clearly a need for better definition of key concepts. There is a need to define OY, capacity, surplus, in order to meet the intent of the law and to meet US foreign policy obligations. Capacity would seem to be a straightforward concept to define. Last April, just prior to hearings before the Department of Commerce concerning herring allocations in the Northwest Atlantic, The Wall Street Journal contained a long article explaining in detail how difficult it is to define and measure capacity for such a seemingly straightforward industry as, for example, the US steel industry. That article in fact was introduced into the record in arguing for more liberal interpretation of the US capacity for the herring fishery. Not only is capacity inherently difficult to define, but whatever the definition may be it may change very rapidly now under the stimulus of extended jurisdiction. Again in the Northeast, we know that this is occurring--that very surprising changes in capacity are taking place. Perhaps these are unwise expansions of capacity, given the state of resources. Nevertheless, capacity however defined is changing rapidly. How we come to a clear understanding of fundamental and key concepts like capacity, which clearly affect not only US fishing allocations but also surpluses to be allocated to foreign nations, perhaps can only evolve in the course of time and in the course of experience. But we cannot lose sight of the fact that sooner or later we are going to have to define them adequately.

We have been subjected in the last 18 months to a great many initials--FCMA, EJ, FCZ, MMA, OY, EIS. Yesterday the initials OIS were introduced--perhaps inadvertently, perhaps unintentionally. They mean objective international scrutiny. It is clear that there is going to be objective international scrutiny. The US does have through its Law of the Sea (LOS) position international obligations. It has been pointed out that the entire structure and philosophy of the FCMA was oriented toward, was influenced by, the US position in the LOS proceedings at the United Nations. We must constantly bear in mind that OIS, in fact, will always be with us.

This brings us again to allocations. It is an intriguing question that involves not only allocations of limited, finite stocks between domestic and foreign fishermen. Allocation will probably be a much more difficult task among commercial and recreational fishermen and conservation interests in this country. As each of these legitimate interests puts in its request for its share, it must also assume at the same time the obligation to accept all of the limitations which necessarily

go with sharing finite resources. Commercial fishermen are being seriously limited in the Northeast by the New England Fishery Management Council. It is clear also that recreational fishermen are going to have to accept similar kinds of limitations--whether limited entry, fishing quotas, or some of the other management limitations that may come along.

I was struck by the number of allocation problems that came up in the discussions; in the surf clam fishery, for example, among different classes of vessels; in the Gulf shrimp fishery, among inshore bait fishermen, inshore juvenile shrimp fishermen, inshore recreational fishermen, and offshore commercial fishermen.

There is another kind of allocation problem: not only are the foreign vessels going home as a result of FCMA, but so are a very significant number of US vessels coming home as a result of FCMA--the hundreds of shrimp boats, for example, fishing off the coasts of Yucatan, off French Guiana. They are the victims of an act for which they had no need, for which they did not ask, and which they probably did not want. And now they have to come home. Are they entitled to a share of that part of the stock which traditionally has been fished by US fishermen within US waters?

This brings me to a point that was raised during discussion of the surf clam fishery. Is there in fact an obligation on the part of the RFMCs for the protection, if you will, of the veterans of the industry--those who pioneered the industry as opposed to the newcomers who may be coming along with more efficient equipment and who may be better able to survive under new circumstances? The point has been made that perhaps, indeed, there is. There is an obligation to the people who pioneered the development of the fisheries or who have been in them many years and are not individually responsible for the circumstances of the fisheries. But it strikes me that this is one of the contradictions we inevitably run into when we try to interpret and implement the FCMA--namely, that it may be contrary to the requirement that the RFMCs shall manage the fisheries efficiently. I am not sure what efficiency means. You can get into an extended discussion about the definition of efficiency just as you can in the definition of capacity.

There are other serious allocation problems. There are going to have to be trade-offs of many kinds. It is clear that in the Northeast we may not be able to have all the herring we want and all the mackerel we want. There now seems to be emerging from biological studies

the appreciation that in fact either we have mackerel or we have herring, but we cannot have both. In the Gulf of Alaska it appears that you either have ocean perch or you have pollock, but you do not have both.

Other kinds of trade-offs between species are going to have to be faced up to. Traditionally we have used the single-species management approach in almost all fisheries. Very successful management efforts have been based on the single-species approach of taking one species at a time, without regard to its position in the ecosystem, setting quotas, and attempting to restore, maintain, and rehabilitate that particular species. If we attempt to do that for all the species, we are going to get into a very difficult if not impossible situation. I do not believe that the concept of single-species management can be applied to the range of species that we are going to have to deal with. If we do and are successful at it from the fishes' point of view, we are going to create an impossible situation from the fishermen's point of view. Fishermen traditionally have been extremely adaptable, extremely flexible, ready to move from one resource to another, depending upon availability, markets, weather, economics, whatever. Carrying the single-species approach to its inevitable conclusion is going to restrict or prohibit the kind of traditional flexibility that is essential for healthy fisheries. Instead we are going to have to consider an ecosystem approach--a biomass approach, if you will--which is multispecies in nature. The International Commission for North Atlantic Fisheries (ICNAF) was working toward that. Possibly it was the only management regime in the world working toward a multispecies or biomass approach. If carried on for a number of years, the ICNAF two-tier system toward biomass management probably would have been successful. We have retreated from that position now. There is, to the best of my knowledge, no commitment, no planning within the regional management plans at this moment toward the biomass, or the ecosystem, or the multispecies management approach. A specific example comes to mind, again from Harold C. Lokken's paper in which he indicated that even with the strictest conservation measures it is unlikely that ocean perch in the Gulf of Alaska can be restored to the point of previous abundance. The fishing pressure on the entire ecosystem is too heavy to permit that, and in fact it was creating an unstable situation for all the groundfish in the Gulf of Alaska. This is clearly one of the most important areas for new approaches to management, for new data needs, and for new biological management concepts. We also are going to require a multispecies <u>economic</u> approach as well as a multispecies <u>biological</u> approach.

I suspect that if the consumer had been the only consideration in fisheries management, as consumer interests are included under the FMCA, we might not have had the FCMA at all. Clearly the consumers in this country were benefiting from the large volume of imports of cheap, subsidized, foreign fish. The impact of the various possible user groups--commercial fishermen, recreational fishermen, environmentalists, and conservationists--each in their own way could work adversely against the best interest of the consumer. If we considered nothing but the interest of each of those three user groups, it is conceivable that the consumer would not benefit. The commercial fisherman obviously is out to fish for price; it is in his interest to make sure that the price is maintained. It is not to his interest to harvest a large volume of fish and dump them on the market, thereby depressing the price and benefiting the consumer. The recreational fishermen, if we took it at the extreme, clearly would prefer nothing but trophy fish with no fish going to the consumer. I admit that this is probably an extreme and an unfair characterization of the situation, but it is sometimes constructive to look at extreme examples. Similarly, if the environmentalists were allowed free rein, there would be no fish landed under extreme circumstance. All fish would be preserved in their natural state.

The FCMA is going to come under constant and increasing scrutiny from environmentalists. They, after all, do have an interest in successful implementation of the FCMA. They can claim considerable credit for the passage of the FCMA. They intend to see that the intent of the FCMA is carried out. This cannot be forgotten as the development of plans proceeds.

On the other hand, we can safely say that there is a great lack of attention by nearly all state legislatures. The FCMA is forcing the resolution of some long-standing problems of fisheries management and of fisheries jurisdiction. We no longer can ignore the problems. We now have the authority; we now have the responsibility; and we now have the obligation to get on with the resolution of those problems. The state legislatures are in the middle of that difficulty--and I suspect that most of them are not aware of the problem at all; they are not aware of the fact that they are going to be presented rather soon with some tough decisions. It will be interesting to see how that works out. It is not only a question of inshore versus offshore jurisdiction across the three-mile line, but it is also a question of those species which migrate the length of the coast. It has been proposed that additional management bodies may

be needed to provide adequate management for such species as bluefish, menhaden, and striped bass, which migrate great distances along the coastline within state waters. It very well may be that additional regulatory or management bodies will be required. I am apprehensive, however, that a proliferation of management bodies may leave the fishermen totally confused as to who is running the show. At the moment, the concept of the RFMCs themselves is not clear, although in New England at least, by the closure of the commercial cod fishery, we have their attention. To add other regulatory bodies has the potential for substantially confusing the situation.

There is the issue of enforcement. My personal feeling is that the enforcement of regulations on foreign fishing vessels is well under control. We have not had the problems that were anticipated. There are obvious efforts at international cooperation. Foreign fishing in my mind is not a problem.

The question of enforcement with US fishermen--both commercial and recreational--is a problem. One need that is not addressed in the FCMA seems to be clear--a provision for observers on US fishing vessels. Another need is the evolution of enforceable fishing regulations. The New England Fishery Management Council has talked at great length about certain regulations that would clearly benefit various species. But the Coast Guard, sometimes at the point of despair, has reminded us of the fact that regulations are worthless unless they can be enforced effectively at sea. It is a continuing problem and, in spite of a great deal of thought and effort and attention, it is going to remain a continuing problem. How do we write regulations which in fact can be enforced and therefore can be effective?

Finally, I would like to mention the possible impact of the LOS negotiations. As Ambassador Thomas A. Clingan, Jr., mentioned, it is up to Jimmy the Greek at this point, I guess, to forecast what is going to happen. I have an imperfect understanding at best of what the negotiating text says, but clearly the emphasis within the text is on a concept closer to maximum sustainable yield than it is on optimum yield. Although provision is made for consideration of social and economic factors within FCZs, or economic zones of the nations of the world, the thrust of the international negotiations is toward protein production. And, if the LOS negotiations are successful and if the US is a party to the treaty, then the question is--Does the apparent shift away from our present management objective of optimum yield to a possible management objective of maximum sustainable yield significantly change

the thrust of the RFMC activities? It very well may be, if that is the case. Clearly our recreational friends will not be happy with that possibility, but it is a possibility that we must keep in mind and it may have to be reconciled with the present thrust of the FCMA.

Those are some of the points that struck me in the course of the discussions. I am supposed to comment on the future. Let us say that the FCMA is going to work--there is common agreement here that it is going to work. But, it is not going to work very well for quite some time. A great many problems are to be resolved. Some of those problems are going to be resolved by deliberate action, some by insight, some by innovation, and some will be resolved by a certain amount of wisdom being brought to bear on the problems. Some of the problems are going to be resolved simply by default--they are going to be resolved by the rush of events that may proceed too rapidly for RFMCs or anybody else to respond to. Thus circumstances, the course of events, are going to set the solution to particular problems. Some of them are going to be resolved by court action. I do not think we have anything to fear from that--I think it is inevitable. That is what courts are for, after all. We can clearly perceive that court action is going to happen. We may assume, also, that the FCMA itself is going to accelerate, or expedite to a degree, the implementation of the LOS treaty.

In any case, the consequences of the FCMA are going to be with us for a long time. The management of the world's fisheries will never be the same again. The FCMA is clearly shaping management practices, trade practices, fishing practices throughout the world. Exactly what those consequences will be in the long distance you know as well as I; you can predict as well as I. So at this time that is probably enough talk. Now we should go back to work trying to make the FCMA work properly. We can go back to work, certainly with no fear of doing nothing at all. Recalling the admonition of Phil Quidley, our host, the only thing we have to fear is failure to learn from the mistakes that we inevitably are going to make.

A P P E N D I X

LIST OF ACRONYMS

CCFPA	Canadian Coastal Fisheries Protection Act
CEQ	Council on Environmental Quality
CF	commercial fisheries
CG	Coast Guard
CZMA	Coastal Zone Management Act
EC	European Community
EEZ	exclusive economic zone
ESA	Endangered Species Act
FAO	Food and Agriculture Organization (United Nations)
FCMA	Fishery Conservation and Management Act
FCZ	fishery conservation zone
FMP	fishery management plan
FOB	free on board
GAGMP	Gulf of Alaska Groundfish Management Plan
GAO	General Accounting Office
GFMC	Gulf Fishery Management Council
GIFA	Governing International Fisheries Agreement
IATTC	Inter-American Tropical Tuna Commission
IBRD	International Bank for Reconstruction and Development
ICNAF	International Commission for North Atlantic Fisheries
ICNT	Informal Composite Negotiating Text
IDB	Inter-American Development Bank
INPFC	International North Pacific Fisheries Commission
ISA	International Seabeds Authority
LOS	Law of the Sea
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MRF	marine recreational fisheries
MSY	maximum sustainable yield
NCMSC	North Carolina Marine Science Council
NEFMC	New England Fishery Management Council
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OTA	Office of Technology Assessment
OY	optimum yield
PFMC	Pacific Fishery Management Council
PMP	preliminary management plan
RFMC	Regional Fishery Management Council
RSW	refrigerated seawater
SSC	Scientific and Statistical Committee
TAC	total allowable catch
UN	United Nations
US	United States
USSR	Soviet Union

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Public Law 94-265
94th Congress, H. R. 200
April 13, 1976

An Act

To provide for the conservation and management of the fisheries, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act, with the following table of contents, may be cited as the "Fishery Conservation and Management Act of 1976". Fishery Conservation and Management Act of 1976, 16 USC 1801 note.

TABLE OF CONTENTS

SEC. 2. FINDINGS, PURPOSES AND POLICY

(a) FINDINGS.—The Congress finds and declares the following: 16 USC 1801.

(1) The fish off the coasts of the United States, the highly migratory species of the high seas, the species which dwell on or in the Continental Shelf appertaining to the United States, and the anadromous species which spawn in United States rivers or estuaries, constitute valuable and renewable natural resources.

These fishery resources contribute to the food supply, economy, and health of the Nation and provide recreational opportunities.

(2) As a consequence of increased fishing pressure and because of the inadequacy of fishery conservation and management practices and controls (A) certain stocks of such fish have been overfished to the point where their survival is threatened, and (B) other such stocks have been so substantially reduced in number that they could become similarly threatened.

(3) Commercial and recreational fishing constitutes a major source of employment and contributes significantly to the economy of the Nation. Many coastal areas are dependent upon fishing and related activities, and their economies have been badly damaged by the overfishing of fishery resources at an ever-increasing rate over the past decade. The activities of massive foreign fishing fleets in waters adjacent to such coastal areas have contributed to such damage, interfered with domestic fishing efforts, and caused destruction of the fishing gear of United States fishermen.

(4) International fishery agreements have not been effective in preventing or terminating the overfishing of these valuable fishery resources. There is danger that irreversible effects from overfishing will take place before an effective international agreement on fishery management jurisdiction can be negotiated, signed, ratified, and implemented.

(5) Fishery resources are finite but renewable. If placed under sound management before overfishing has caused irreversible effects, the fisheries can be conserved and maintained so as to provide optimum yields on a continuing basis.

(6) A national program for the conservation and management of the fishery resources of the United States is necessary to prevent overfishing, to rebuild overfished stocks, to insure conservation, and to realize the full potential of the Nation's fishery resources.

(7) A national program for the development of fisheries which are underutilized or not utilized by United States fishermen, including bottom fish off Alaska, is necessary to assure that our citizens benefit from the employment, food supply, and revenue which could be generated thereby.

(b) PURPOSES.—It is therefore declared to be the purposes of the Congress in this Act—

(1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States, and the anadromous species and Continental Shelf fishery resources of the United States, by establishing (A) a fishery conservation zone within which the United States will assume exclusive fishery management authority over all fish, except highly migratory species, and (B) exclusive fishery management authority beyond such zone over such anadromous species and Continental Shelf fishery resources;

(2) to support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species, and to encourage the negotiation and implementation of additional such agreements as necessary;

(3) to promote domestic commercial and recreational fishing under sound conservation and management principles;

(4) to provide for the preparation and implementation, in accordance with national standards, of fishery management plans

which will achieve and maintain, on a continuing basis, the optimum yield from each fishery;

(5) to establish Regional Fishery Management Councils to prepare, monitor, and revise such plans under circumstances (A) which will enable the States, the fishing industry, consumer and environmental organizations, and other interested persons to participate in, and advise on, the establishment and administration of such plans, and (B) which take into account the social and economic needs of the States; and

(6) to encourage the development of fisheries which are currently underutilized or not utilized by United States fishermen, including bottom fish off Alaska.

(c) POLICY.—It is further declared to be the policy of the Congress in this Act—

(1) to maintain without change the existing territorial or other ocean jurisdiction of the United States for all purposes other than the conservation and management of fishery resources, as provided for in this Act;

(2) to authorize no impediment to, or interference with, recognized legitimate uses of the high seas, except as necessary for the conservation and management of fishery resources, as provided for in this Act;

(3) to assure that the national fishery conservation and management program utilizes, and is based upon, the best scientific information available; involves, and is responsive to the needs of, interested and affected States and citizens; promotes efficiency; draws upon Federal, State, and academic capabilities in carrying out research, administration, management, and enforcement; and is workable and effective;

(4) to permit foreign fishing consistent with the provisions of this Act; and

(5) to support and encourage continued active United States efforts to obtain an internationally acceptable treaty, at the Third United Nations Conference on the Law of the Sea, which provides for effective conservation and management of fishery resources.

SEC. 3. DEFINITIONS. 16 USC 1802.

As used in this Act, unless the context otherwise requires—

(1) The term "anadromous species" means species of fish which spawn in fresh or estuarine waters of the United States and which migrate to ocean waters.

(2) The term "conservation and management" refers to all of the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment; and (B) which are designed to assure that—

(i) a supply of food and other products may be taken, and that recreational benefits may be obtained, on a continuing basis;

(ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and

(iii) there will be a multiplicity of options available with respect to future uses of these resources.

(3) The term "Continental Shelf" means the seabed and subsoil of the submarine areas adjacent to the coast, but outside the area of the territorial sea, of the United States, to a depth of 200 meters or, beyond that limit, to where the depth of the super-

jacent waters admits of the exploitation of the natural resources of such areas.

(4) The term "Continental Shelf fishery resources" means the following:

COELENTERATA

Bamboo Coral—Acanella spp.;
Black Coral—Antipathes spp.;
Gold Coral—Callogorgia spp.;
Precious Red Coral—Corallium spp.;
Bamboo Coral—Keratoisis spp.; and
Gold Coral—Parazoanthus spp.

CRUSTACEA

Tanner Crab—Chionoecetes tanneri;
Tanner Crab—Chionoecetes opilio;
Tanner Crab—Chionoecetes angulatus;
Tanner Crab—Chionoecetes bairdi;
King Crab—Paralithodes camtschatica;
King Crab—Paralithodes platypus;
King Crab—Paralithodes brevipes;
Lobster—Homarus americanus;
Dungeness Crab—Cancer magister;
California King Crab—Paralithodes californiensis;
California King Crab—Paralithodes rathbuni;
Golden King Crab—Lithodes aequispinus;
Northern Stone Crab—Lithodes maja;
Stone Crab—Menippe mercenaria; and
Deep-sea Red Crab—Geryon quinquedens.

MOLLUSKS

Red Abalone—Haliotis rufescens;
Pink Abalone—Haliotis corrugata;
Japanese Abalone—Haliotis kamtschatkana;
Queen Conch—Strombus gigas;
Surf Clam—Spisula solidissima; and
Ocean Quahog—Artica islandica.

SPONGES

Glove Sponge—Hippiospongia canaliculata;
Sheepswool Sponge—Hippiospongia lachne;
Grass Sponge—Spongia graminea; and
Yellow Sponge—Spongia barbera.

Publication in Federal Register.

If the Secretary determines, after consultation with the Secretary of State, that living organisms of any other sedentary species are, at the harvestable stage, either—

(A) immobile on or under the seabed, or

(B) unable to move except in constant physical contact with the seabed or subsoil,

of the Continental Shelf which appertains to the United States, and publishes notice of such determination in the Federal Register, such sedentary species shall be considered to be added to the foregoing list and included in such term for purposes of this Act.

(5) The term "Council" means any Regional Fishery Management Council established under section 302.

(6) The term "fish" means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals, birds, and highly migratory species.

(7) The term "fishery" means—

(A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and

(B) any fishing for such stocks.

(8) The term "fishery conservation zone" means the fishery conservation zone established by section 101.

(9) The term "fishery resource" means any fishery, any stock of fish, any species of fish, and any habitat of fish.

(10) The term "fishing" means—

(A) the catching, taking, or harvesting of fish;

(B) the attempted catching, taking, or harvesting of fish;

(C) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or

(D) any operations at sea in support of, or in preparation for, any activity described in subparagraphs (A) through (C).

Such term does not include any scientific research activity which is conducted by a scientific research vessel.

(11) The term "fishing vessel" means any vessel, boat, ship, or other craft which is used for, equipped to be used for, or of a type which is normally used for—

(A) fishing; or

(B) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.

(12) The term "foreign fishing" means fishing by a vessel other than a vessel of the United States.

(13) The term "high seas" means all waters beyond the territorial sea of the United States and beyond any foreign nation's territorial sea, to the extent that such sea is recognized by the United States.

(14) The term "highly migratory species" means species of tuna which, in the course of their life cycle, spawn and migrate over great distances in waters of the ocean.

(15) The term "international fishery agreement" means any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party.

(16) The term "Marine Fisheries Commission" means the Atlantic States Marine Fisheries Commission, the Gulf States Marine Fisheries Commission, or the Pacific Marine Fisheries Commission.

(17) The term "national standards" means the national standards for fishery conservation and management set forth in section 301.

(18) The term "optimum", with respect to the yield from a fishery, means the amount of fish—

(A) which will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities; and

(B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor.

(19) The term "person" means any individual (whether or not a citizen or national of the United States), any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local, or foreign government or any entity of any such government.

(20) The term "Secretary" means the Secretary of Commerce or his designee.

(21) The term "State" means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, Guam, and any other Commonwealth, territory, or possession of the United States.

(22) The term "stock of fish" means a species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

(23) The term "treaty" means any international fishery agreement which is a treaty within the meaning of section 2 of article II of the Constitution.

USC prec. title 1.

(24) The term "United States", when used in a geographical context, means all the States thereof.

(25) The term "vessel of the United States" means any vessel documented under the laws of the United States or registered under the laws of any State.

TITLE I—FISHERY MANAGEMENT AUTHORITY OF THE UNITED STATES

16 USC 1811.

SEC. 101. FISHERY CONSERVATION ZONE.

There is established a zone contiguous to the territorial sea of the United States to be known as the fishery conservation zone. The inner boundary of the fishery conservation zone is a line coterminous with the seaward boundary of each of the coastal States, and the outer boundary of such zone is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured.

16 USC 1812.

SEC. 102. EXCLUSIVE FISHERY MANAGEMENT AUTHORITY

The United States shall exercise exclusive fishery management authority, in the manner provided for in this Act, over the following:

(1) All fish within the fishery conservation zone.

(2) All anadromous species throughout the migratory range of each such species beyond the fishery conservation zone; except that such management authority shall not extend to such species during the time they are found within any foreign nation's territorial sea or fishery conservation zone (or the equivalent), to the extent that such sea or zone is recognized by the United States.

(3) All Continental Shelf fishery resources beyond the fishery conservation zone.

16 USC 1813.

SEC. 103. HIGHLY MIGRATORY SPECIES.

The exclusive fishery management authority of the United States shall not include, nor shall it be construed to extend to, highly migratory species of fish.

16 USC 1811 note.

SEC. 104. EFFECTIVE DATE.

This title shall take effect March 1, 1977.

TITLE II—FOREIGN FISHING AND INTERNATIONAL FISHERY AGREEMENTS

SEC. 201. FOREIGN FISHING. 16 USC 1821.

(a) IN GENERAL.—After February 28, 1977, no foreign fishing is authorized within the fishery conservation zone, or for anadromous species or Continental Shelf fishery resources beyond the fishery conservation zone, unless such foreign fishing—

(1) is authorized under subsection (b) or (c);

(2) is not prohibited by subsection (f); and

(3) is conducted under, and in accordance with, a valid and applicable permit issued pursuant to section 204.

(b) EXISTING INTERNATIONAL FISHERY AGREEMENTS.—Foreign fishing described in subsection (a) may be conducted pursuant to an international fishery agreement (subject to the provisions of section 202(b) or (c)), if such agreement—

(1) was in effect on the date of enactment of this Act; and

(2) has not expired, been renegotiated, or otherwise ceased to be of force and effect with respect to the United States.

(c) GOVERNING INTERNATIONAL FISHERY AGREEMENTS.—Foreign fishing described in subsection (a) may be conducted pursuant to an international fishery agreement (other than a treaty) which meets the requirements of this subsection if such agreement becomes effective after application of section 203. Any such international fishery agreement shall hereafter in this Act be referred to as a "governing international fishery agreement". Each governing international fishery agreement shall acknowledge the exclusive fishery management authority of the United States, as set forth in this Act. It is the sense of the Congress that each such agreement shall include a binding commitment, on the part of such foreign nation and its fishing vessels, to comply with the following terms and conditions: Terms and conditions.

(1) The foreign nation, and the owner or operator of any fishing vessel fishing pursuant to such agreement, will abide by all regulations promulgated by the Secretary pursuant to this Act, including any regulations promulgated to implement any applicable fishery management plan or any preliminary fishery management plan.

(2) The foreign nation, and the owner or operator of any fishing vessel fishing pursuant to such agreement, will abide by the requirement that—

(A) any officer authorized to enforce the provisions of this Act (as provided for in section 311) be permitted— Post, p. 358.

(i) to board, and search or inspect, any such vessel at any time,

(ii) to make arrests and seizures provided for in section 311(b) whenever such officer has reasonable cause to believe, as a result of such a search or inspection, that any such vessel or any person has committed an act prohibited by section 307, and Post, p. 355.

(iii) to examine and make notations on the permit issued pursuant to section 204 for such vessel;

(B) the permit issued for any such vessel pursuant to section 204 be prominently displayed in the wheelhouse of such vessel;

(C) transponders, or such other appropriate position-fixing and identification equipment as the Secretary of the department in which the Coast Guard is operating determines

to be appropriate, be installed and maintained in working order on each such vessel;

(D) duly authorized United States observers be permitted on board any such vessel and that the United States be reimbursed for the cost of such observers;

(E) any fees required under section 204(b)(10) be paid in advance;

(F) agents be appointed and maintained within the United States who are authorized to receive and respond to any legal process issued in the United States with respect to such owner or operator; and

(G) responsibility be assumed, in accordance with any requirements prescribed by the Secretary, for the reimbursement of United States citizens for any loss of, or damage to, their fishing vessels, fishing gear, or catch which is caused by any fishing vessel of that nation;

and will abide by any other monitoring, compliance, or enforcement requirement related to fishery conservation and management which is included in such agreement.

(3) The foreign nation and the owners or operators of all of the fishing vessels of such nation shall not, in any year, exceed such nation's allocation of the total allowable level of foreign fishing, as determined under subsection (e).

(4) The foreign nation will—

(A) apply, pursuant to section 204, for any required permits;

(B) deliver promptly to the owner or operator of the appropriate fishing vessel any permit which is issued under that section for such vessel; and

(C) abide by, and take appropriate steps under its own laws to assure that all such owners and operators comply with, section 204(a) and the applicable conditions and restrictions established under section 204(b)(7).

(d) TOTAL ALLOWABLE LEVEL OF FOREIGN FISHING.—The total allowable level of foreign fishing, if any, with respect to any fishery subject to the exclusive fishery management authority of the United States, shall be that portion of the optimum yield of such fishery which will not be harvested by vessels of the United States, as determined in accordance with the provisions of this Act.

(e) ALLOCATION OF ALLOWABLE LEVEL.—The Secretary of State, in cooperation with the Secretary, shall determine the allocation among foreign nations of the total allowable level of foreign fishing which is permitted with respect to any fishery subject to the exclusive fishery management authority of the United States. In making any such determination, the Secretary of State and the Secretary shall consider—

(1) whether, and to what extent, the fishing vessels of such nations have traditionally engaged in fishing in such fishery;

(2) whether such nations have cooperated with the United States in, and made substantial contributions to, fishery research and the identification of fishery resources;

(3) whether such nations have cooperated with the United States in enforcement and with respect to the conservation and management of fishery resources; and

(4) such other matters as the Secretary of State, in cooperation with the Secretary, deems appropriate.

(f) RECIPROCITY.—Foreign fishing shall not be authorized for the fishing vessels of any foreign nation unless such nation satisfies the

Secretary and the Secretary of State that such nation extends substantially the same fishing privileges to fishing vessels of the United States, if any, as the United States extends to foreign fishing vessels.

(g) PRELIMINARY FISHERY MANAGEMENT PLANS.—The Secretary, when notified by the Secretary of State that any foreign nation has submitted an application under section 204(b), shall prepare a preliminary fishery management plan for any fishery covered by such application if the Secretary determines that no fishery management plan for that fishery will be prepared and implemented, pursuant to title III, before March 1, 1977. To the extent practicable, each such plan— Post, p. 346.

(1) shall contain a preliminary description of the fishery and a preliminary determination as to the optimum yield from such fishery and the total allowable level of foreign fishing with respect to such fishery;

(2) shall require each foreign fishing vessel engaged or wishing to engage in such fishery to obtain a permit from the Secretary;

(3) shall require the submission of pertinent data to the Secretary, with respect to such fishery, as described in section 303(a)(5); and

(4) may, to the extent necessary to prevent irreversible effects from overfishing, with respect to such fishery, contain conservation and management measures applicable to foreign fishing which—

(A) are determined to be necessary and appropriate for the conservation and management of such fishery,

(B) are consistent with the national standards, the other provisions of this Act, and other applicable law, and

(C) are described in section 303(b)(2), (3), (4), (5), and (7).

Each preliminary fishery management plan shall be in effect with respect to foreign fishing for which permits have been issued until a fishery management plan is prepared and implemented, pursuant to title III, with respect to such fishery. The Secretary may, in accordance with section 553 of title 5, United States Code, also prepare and promulgate interim regulations with respect to any such preliminary plan. Such regulations shall be in effect until regulations implementing the applicable fishery management plan are promulgated pursuant to section 305. Regulations.

SEC. 202. INTERNATIONAL FISHERY AGREEMENTS. 16 USC 1822.

(a) NEGOTIATIONS.—The Secretary of State—

(1) shall renegotiate treaties as provided for in subsection (b);

(2) shall negotiate governing international fishery agreements described in section 201(c);

(3) may negotiate boundary agreements as provided for in subsection (d);

(4) shall, upon the request of and in cooperation with the Secretary, initiate and conduct negotiations for the purpose of entering into international fishery agreements—

(A) which allow fishing vessels of the United States equitable access to fish over which foreign nations assert exclusive fishery management authority, and

(B) which provide for the conservation and management of anadromous species and highly migratory species; and

(5) may enter into such other negotiations, not prohibited by subsection (c), as may be necessary and appropriate to further the purposes, policy, and provisions of this Act.

(b) TREATY RENEGOTIATION.—The Secretary of State, in cooperation with the Secretary, shall initiate, promptly after the date of enactment of this Act, the renegotiation of any treaty which pertains to fishing within the fishery conservation zone (or within the area that will constitute such zone after February 28, 1977), or for anadromous species or Continental Shelf fishery resources beyond such zone or area, and which is in any manner inconsistent with the purposes, policy, or provisions of this Act, in order to conform such treaty to such purposes, policy, and provisions. It is the sense of Congress that the United States shall withdraw from any such treaty, in accordance with its provisions, if such treaty is not so renegotiated within a reasonable period of time after such date of enactment.

(c) INTERNATIONAL FISHERY AGREEMENTS.—No international fishery agreement (other than a treaty) which pertains to foreign fishing within the fishery conservation zone (or within the area that will constitute such zone after February 28, 1977), or for anadromous species or Continental Shelf fishery resources beyond such zone or area—

(1) which is in effect on June 1, 1976, may thereafter be renewed, extended, or amended; or

(2) may be entered into after May 31, 1976;

by the United States unless it is in accordance with the provisions of section 201(e).

(d) BOUNDARY NEGOTIATIONS.—The Secretary of State, in cooperation with the Secretary, may initiate and conduct negotiations with any adjacent or opposite foreign nation to establish the boundaries of the fishery conservation zone of the United States in relation to any such nation.

(e) NONRECOGNITION.—It is the sense of the Congress that the United States Government shall not recognize the claim of any foreign nation to a fishery conservation zone (or the equivalent) beyond such nation's territorial sea, to the extent that such sea is recognized by the United States, if such nation—

(1) fails to consider and take into account traditional fishing activity of fishing vessels of the United States;

(2) fails to recognize and accept that highly migratory species are to be managed by applicable international fishery agreements, whether or not such nation is a party to any such agreement; or

(3) imposes on fishing vessels of the United States any conditions or restrictions which are unrelated to fishery conservation and management.

16 USC 1823.

SEC. 203. CONGRESSIONAL OVERSIGHT OF GOVERNING INTERNATIONAL FISHERY AGREEMENTS.

Transmittal to Congress.

(a) IN GENERAL.—No governing international fishery agreement shall become effective with respect to the United States before the close of the first 60 calendar days of continuous session of the Congress after the date on which the President transmits to the House of Representatives and to the Senate a document setting forth the text of such governing international fishery agreement. A copy of the document shall be delivered to each House of Congress on the same day and shall be delivered to the Clerk of the House of Representatives, if the House is not in session, and to the Secretary of the Senate, if the Senate is not in session.

(b) REFERRAL TO COMMITTEES.—Any document described in subsection (a) shall be immediately referred in the House of Representatives to the Committee on Merchant Marine and Fisheries, and in the Senate to the Committees on Commerce and Foreign Relations.

(c) COMPUTATION OF 60-DAY PERIOD.—For purposes of subsection (a)—

(1) continuity of session is broken only by an adjournment of Congress sine die; and

(2) the days on which either House is not in session because of an adjournment of more than 3 days to a day certain are excluded in the computation of the 60-day period.

(d) CONGRESSIONAL PROCEDURES.—

(1) RULES OF THE HOUSE OF REPRESENTATIVES AND SENATE.—The provisions of this section are enacted by the Congress—

(A) as an exercise of the rulemaking power of the House of Representatives and the Senate, respectively, and they are deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of fishery agreement resolutions described in paragraph (2), and they supersede other rules only to the extent that they are inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as they relate to the procedure of that House) at any time, and in the same manner and to the same extent as in the case of any other rule of that House.

(2) DEFINITION.—For purposes of this subsection, the term "fishery agreement resolution" refers to a joint resolution of either House of Congress—

(A) the effect of which is to prohibit the entering into force and effect of any governing international fishery agreement the text of which is transmitted to the Congress pursuant to subsection (a); and

(B) which is reported from the Committee on Merchant Marine and Fisheries of the House of Representatives or the Committee on Commerce or the Committee on Foreign Relations of the Senate, not later than 45 days after the date on which the document described in subsection (a) relating to that agreement is transmitted to the Congress.

(3) PLACEMENT ON CALENDAR.—Any fishery agreement resolution upon being reported shall immediately be placed on the appropriate calendar.

(4) FLOOR CONSIDERATION IN THE HOUSE.—

(A) A motion in the House of Representatives to proceed to the consideration of any fishery agreement resolution shall be highly privileged and not debatable. An amendment to the motion shall not be in order, nor shall it be in order to move to reconsider the vote by which the motion is agreed to or disagreed to.

(B) Debate in the House of Representatives on any fishery agreement resolution shall be limited to not more than 10 hours, which shall be divided equally between those favoring and those opposing the resolution. A motion further to limit debate shall not be debatable. It shall not be in order to move to recommit any fishery agreement resolution or to move to reconsider the vote by which any fishery agreement resolution is agreed to or disagreed to. Debate limitation.

(C) Motions to postpone, made in the House of Representatives with respect to the consideration of any fishery agreement resolution, and motions to proceed to the consideration of other business, shall be decided without debate.

(D) All appeals from the decisions of the Chair relating to the application of the Rules of the House of Representatives to the procedure relating to any fishery agreement resolution shall be decided without debate.

(E) Except to the extent specifically provided in the preceding provisions of this subsection, consideration of any fishery agreement resolution shall be governed by the Rules of the House of Representatives applicable to other bills and resolutions in similar circumstances.

(5) FLOOR CONSIDERATION IN THE SENATE.—

(A) A motion in the Senate to proceed to the consideration of any fishery agreement resolution shall be privileged and not debatable. An amendment to the motion shall not be in order, nor shall it be in order to move to reconsider the vote by which the motion is agreed to or disagreed to.

Debate limitation.

(B) Debate in the Senate on any fishery agreement resolution and on all debatable motions and appeals in connection therewith shall be limited to not more than 10 hours. The time shall be equally divided between, and controlled by, the majority leader and the minority leader or their designees.

(C) Debate in the Senate on any debatable motion or appeal in connection with any fishery agreement resolution shall be limited to not more than 1 hour, to be equally divided between, and controlled by, the mover of the motion or appeal and the manager of the resolution, except that if the manager of the resolution is in favor of any such motion or appeal, the time in opposition thereto shall be controlled by the minority leader or his designee. The majority leader and the minority leader, or either of them, may allot additional time to any Senator during the consideration of any debatable motion or appeal, from time under their control with respect to the applicable fishery agreement resolution.

(D) A motion in the Senate to further limit debate is not debatable. A motion to recommit any fishery agreement resolution is not in order.

16 USC 1824.

SEC. 204. PERMITS FOR FOREIGN FISHING.

(a) IN GENERAL.—After February 28, 1977, no foreign fishing vessel shall engage in fishing within the fishery conservation zone, or for anadromous species or Continental Shelf fishery resources beyond such zone, unless such vessel has on board a valid permit issued under this section for such vessel.

(b) APPLICATIONS AND PERMITS UNDER GOVERNING INTERNATIONAL FISHERY AGREEMENTS.—

(1) ELIGIBILITY.—Each foreign nation with which the United States has entered into a governing international fishery agreement shall submit an application to the Secretary of State each year for a permit for each of its fishing vessels that wishes to engage in fishing described in subsection (a).

(2) FORMS.—The Secretary, in consultation with the Secretary of State and the Secretary of the department in which the Coast Guard is operating, shall prescribe the forms for permit applications submitted under this subsection and for permits issued pursuant to any such application.

(3) CONTENTS.—Any application made under this subsection shall specify—

(A) the name and official number or other identification of each fishing vessel for which a permit is sought, together with the name and address of the owner thereof;

(B) the tonnage, capacity, speed, processing equipment, type and quantity of fishing gear, and such other pertinent information with respect to characteristics of each such vessel as the Secretary may require;

(C) each fishery in which each such vessel wishes to fish;

(D) the amount of fish or tonnage of catch contemplated for each such vessel during the time such permit is in force; and

(E) the ocean area in which, and the season or period during which, such fishing will be conducted;

and shall include any other pertinent information and material which the Secretary may require.

(4) TRANSMITTAL FOR ACTION.—Upon receipt of any application which complies with the requirements of paragraph (3), the Secretary of State shall publish such application in the Federal Register and shall promptly transmit— Publication in Federal Register.

(A) such application, together with his comments and recommendations thereon, to the Secretary;

(B) a copy of the application to each appropriate Council and to the Secretary of the department in which the Coast Guard is operating; and

(C) a copy of such material to the Committee on Merchant Marine and Fisheries of the House of Representatives and to the Committees on Commerce and Foreign Relations of the Senate. Transmittal to congressional committees.

(5) ACTION BY COUNCIL.—After receipt of an application transmitted under paragraph (4)(B), each appropriate Council shall prepare and submit to the Secretary such written comments on the application as it deems appropriate. Such comments shall be submitted within 45 days after the date on which the application is received by the Council and may include recommendations with respect to approval of the application and, if approval is recommended, with respect to appropriate conditions and restrictions thereon. Any interested person may submit comments to such Council with respect to any such application. The Council shall consider any such comments in formulating its submission to the Secretary. Written comments.

(6) APPROVAL.—After receipt of any application transmitted under paragraph (4)(A), the Secretary shall consult with the Secretary of State and, with respect to enforcement, with the Secretary of the department in which the Coast Guard is operating. The Secretary, after taking into consideration the views and recommendations of such Secretaries, and any comments submitted by any Council under paragraph (5), may approve the application, if he determines that the fishing described in the application will meet the requirements of this Act.

(7) ESTABLISHMENT OF CONDITIONS AND RESTRICTIONS.—The Secretary shall establish conditions and restrictions which shall be included in each permit issued pursuant to any application approved under paragraph (6) and which must be complied with by the owner or operator of the fishing vessel for which the permit is issued. Such conditions and restrictions shall include the following:

(A) All of the requirements of any applicable fishery management plan, or preliminary fishery management plan, and the regulations promulgated to implement any such plan.

(B) The requirement that no permit may be used by any vessel other than the fishing vessel for which it is issued.

(C) The requirements described in section 201(c) (1), (2), and (3).

(D) Any other condition and restriction related to fishery conservation and management which the Secretary prescribes as necessary and appropriate.

(8) NOTICE OF APPROVAL.—The Secretary shall promptly transmit a copy of each application approved under paragraph (6) and the conditions and restrictions established under paragraph (7) to—

(A) the Secretary of State for transmittal to the foreign nation involved;

(B) the Secretary of the department in which the Coast Guard is operating;

(C) any Council which has authority over any fishery specified in such application; and

Transmittal to congressional committees.

(D) the Committee on Merchant Marine and Fisheries of the House of Representatives and the Committees on Commerce and Foreign Relations of the Senate.

(9) DISAPPROVAL OF APPLICATIONS.—If the Secretary does not approve any application submitted by a foreign nation under this subsection, he shall promptly inform the Secretary of State of the disapproval and his reasons therefore. The Secretary of State shall notify such foreign nation of the disapproval and the reasons therefor. Such foreign nation, after taking into consideration the reasons for disapproval, may submit a revised application under this subsection.

(10) FEES.—Reasonable fees shall be paid to the Secretary by the owner or operator of any foreign fishing vessel for which a permit is issued pursuant to this subsection. The Secretary, in consultation with the Secretary of State, shall establish and publish a schedule of such fees, which shall apply nondiscriminatorily to each foreign nation. In determining the level of such fees, the Secretary may take into account the cost of carrying out the provisions of this Act with respect to foreign fishing, including, but not limited to, the cost of fishery conservation and management, fisheries research, administration, and enforcement.

(11) ISSUANCE OF PERMITS.—If a foreign nation notifies the Secretary of State of its acceptance of the conditions and restrictions established by the Secretary under paragraph (7), the Secretary of State shall promptly transmit such notification to the Secretary. Upon payment of the applicable fees established pursuant to paragraph (10), the Secretary shall thereupon issue to such foreign nation, through the Secretary of State, permits for the appropriate fishing vessels of that nation. Each permit shall contain a statement of all conditions and restrictions established under paragraph (7) which apply to the fishing vessel for which the permit is issued.

(12) SANCTIONS.—If any foreign fishing vessel for which a permit has been issued pursuant to this subsection has been used in the commission of any act prohibited by section 307 the Secretary may, or if any civil penalty imposed under section 308 or any criminal fine imposed under section 309 has not been paid and is overdue the Secretary shall—

(A) revoke such permit, with or without prejudice to the right of the foreign nation involved to obtain a permit for such vessel in any subsequent year;

(B) suspend such permit for the period of time deemed appropriate; or

(C) impose additional conditions and restrictions on the approved application of the foreign nation involved and on any permit issued under such application.

Any permit which is suspended under this paragraph for nonpayment of a civil penalty shall be reinstated by the Secretary upon the payment of such civil penalty together with interest thereon at the prevailing rate.

(c) REGISTRATION PERMITS.—The Secretary of State, in cooperation with the Secretary, shall issue annually a registration permit for each fishing vessel of a foreign nation which is a party to an international fishery agreement under which foreign fishing is authorized by section 201(b) and which wishes to engage in fishing described in subsection (a). Each such permit shall set forth the terms and conditions contained in the agreement that apply with respect to such fishing, and shall include the additional requirement that the owner or operator of the fishing vessel for which the permit is issued shall prominently display such permit in the wheelhouse of such vessel and show it, upon request, to any officer authorized to enforce the provisions of this Act (as provided for in section 311). The Secretary of State, after consultation with the Secretary and the Secretary of the department in which the Coast Guard is operating, shall prescribe the form and manner in which applications for registration permits may be made, and the forms of such permits. The Secretary of State may establish, require the payment of, and collect fees for registration permits; except that the level of such fees shall not exceed the administrative costs incurred by him in issuing such permits.

SEC. 205. IMPORT PROHIBITIONS. 16 USC 1825.

(a) DETERMINATIONS BY SECRETARY OF STATE.—If the Secretary of State determines that—

(1) he has been unable, within a reasonable period of time, to conclude with any foreign nation an international fishery agreement allowing fishing vessels of the United States equitable access to fisheries over which that nation asserts exclusive fishery management authority, as recognized by the United States, in accordance with traditional fishing activities of such vessels, if any, and under terms not more restrictive than those established under sections 201 (c) and (d) and 204 (b) (7) and (10), because such nation has (A) refused to commence negotiations, or (B) failed to negotiate in good faith;

(2) any foreign nation is not allowing fishing vessels of the United States to engage in fishing for highly migratory species in accordance with an applicable international fishery agreement, whether or not such nation is a party thereto;

(3) any foreign nation is not complying with its obligations under any existing international fishery agreement concerning fishing by fishing vessels of the United States in any fishery over which that nation asserts exclusive fishery management authority; or

(4) any fishing vessel of the United States, while fishing in waters beyond any foreign nation's territorial sea, to the extent that such sea is recognized by the United States, is seized by any foreign nation—

(A) in violation of an applicable international fishery agreement;

(B) without authorization under an agreement between the United States and such nation; or

(C) as a consequence of a claim of jurisdiction which is not recognized by the United States;

he shall certify such determination to the Secretary of the Treasury.

(b) PROHIBITIONS.—Upon receipt of any certification from the Secretary of State under subsection (a), the Secretary of the Treasury shall immediately take such action as may be necessary and appropriate to prohibit the importation into the United States—

(1) of all fish and fish products from the fishery involved, if any; and

(2) upon recommendation of the Secretary of State, such other fish or fish products, from any fishery of the foreign nation concerned, which the Secretary of State finds to be appropriate to carry out the purposes of this section.

(c) REMOVAL OF PROHIBITION.—If the Secretary of State finds that the reasons for the imposition of any import prohibition under this section no longer prevail, the Secretary of State shall notify the Secretary of the Treasury, who shall promptly remove such import prohibition.

(d) DEFINITIONS.—As used in this section—

(1) The term "fish" includes any highly migratory species.

(2) The term "fish products" means any article which is produced from or composed of (in whole or in part) any fish.

TITLE III—NATIONAL FISHERY MANAGEMENT PROGRAM

16 USC 1851.

SEC. 301. NATIONAL STANDARDS FOR FISHERY CONSERVATION AND MANAGEMENT.

(a) IN GENERAL.—Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the following national standards for fishery conservation and management:

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.

(2) Conservation and management measures shall be based upon the best scientific information available.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

(c) GUIDELINES.—The Secretary shall establish guidelines, based on the national standards, to assist in the development of fishery management plans.

SEC. 302. REGIONAL FISHERY MANAGEMENT COUNCILS. 16 USC 1852.

(a) ESTABLISHMENT.—There shall be established, within 120 days after the date of the enactment of this Act, eight Regional Fishery Management Councils, as follows: Establishment.

(1) NEW ENGLAND COUNCIL.—The New England Fishery Management Council shall consist of the States of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut and shall have authority over the fisheries in the Atlantic Ocean seaward of such States. The New England Council shall have 17 voting members, including 11 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(2) MID-ATLANTIC COUNCIL.—The Mid-Atlantic Fishery Management Council shall consist of the States of New York, New Jersey, Delaware, Pennsylvania, Maryland, and Virginia and shall have authority over the fisheries in the Atlantic Ocean seaward of such States. The Mid-Atlantic Council shall have 19 voting members, including 12 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(3) SOUTH ATLANTIC COUNCIL.—The South Atlantic Fishery Management Council shall consist of the States of North Carolina, South Carolina, Georgia, and Florida and shall have authority over the fisheries in the Atlantic Ocean seaward of such States. The South Atlantic Council shall have 13 voting members, including 8 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(4) CARIBBEAN COUNCIL.—The Caribbean Fishery Management Council shall consist of the Virgin Islands and the Commonwealth of Puerto Rico and shall have authority over the fisheries in the Caribbean Sea and Atlantic Ocean seaward of such States. The Caribbean Council shall have 7 voting members, including 4 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(5) GULF COUNCIL.—The Gulf of Mexico Fishery Management Council shall consist of the States of Texas, Louisiana, Mississippi, Alabama, and Florida and shall have authority over the fisheries in the Gulf of Mexico seaward of such States. The Gulf Council shall have 17 voting members, including 11 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(6) PACIFIC COUNCIL.—The Pacific Fishery Management Council shall consist of the States of California, Oregon, Washington, and Idaho and shall have authority over the fisheries in the Pacific Ocean seaward of such States. The Pacific Council shall have 13 voting members, including 8 appointed by the

Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

(7) NORTH PACIFIC COUNCIL.—The North Pacific Fishery Management Council shall consist of the States of Alaska, Washington, and Oregon and shall have authority over the fisheries in the Arctic Ocean, Bering Sea, and Pacific Ocean seaward of Alaska. The North Pacific Council shall have 11 voting members, including 7 appointed by the Secretary pursuant to subsection (b) (1) (C) (5 of whom shall be appointed from the State of Alaska and 2 of whom shall be appointed from the State of Washington).

(8) WESTERN PACIFIC COUNCIL.—The Western Pacific Fishery Management Council shall consist of the State of Hawaii, American Samoa, and Guam and shall have authority over the fisheries in the Pacific Ocean seaward of such States. The Western Pacific Council shall have 11 voting members, including 7 appointed by the Secretary pursuant to subsection (b)(1)(C) (at least one of whom shall be appointed from each such State).

Each Council shall reflect the expertise and interest of the several constituent States in the ocean area over which such Council is granted authority.

(b) VOTING MEMBERS.—(1) The voting members of each Council shall be:

(A) The principal State official with marine fishery management responsibility and expertise in each constituent State, who is designated as such by the Governor of the State, so long as the official continues to hold such position, or the designee of such official.

(B) The regional director of the National Marine Fisheries Service for the geographic area concerned, or his designee, except that if two such directors are within such geographical area, the Secretary shall designate which of such directors shall be the voting member.

(C) The members required to be appointed by the Secretary shall be appointed by the Secretary from a list of qualified individuals submitted by the Governor of each applicable constituent State. With respect to the initial such appointments, such Governors shall submit such lists to the Secretary as soon as practicable, not later than 45 days after the date of the enactment of this Act. As used in this subparagraph, (i) the term "list of qualified individuals" shall include the names (including pertinent biographical data) of not less than three such individuals for each applicable vacancy, and (ii) the term "qualified individual" means an individual who is knowledgeable or experienced with regard to the management, conservation, or recreational or commercial harvest, of the fishery resources of the geographical area concerned.

"List of qualified individuals."

"Qualified individual."

Term.

(2) Each voting member appointed to a Council pursuant to paragraph (1)(C) shall serve for a term of 3 years; except that, with respect to the members initially so appointed, the Secretary shall designate up to one-third thereof to serve for a term of 1 year, up to one-third thereof to serve for a term of 2 years, and the remaining such members to serve for a term of 3 years.

(3) Successors to the voting members of any Council shall be appointed in the same manner as the original voting members. Any individual appointed to fill a vacancy occurring prior to the expiration of any term of office shall be appointed for the remainder of that term.

(c) NONVOTING MEMBERS.—(1) The nonvoting members of each Council shall be:

(A) The regional or area director of the United States Fish and Wildlife Service for the geographical area concerned, or his designee.

(B) The commander of the Coast Guard district for the geographical area concerned, or his designee; except that, if two Coast Guard districts are within such geographical area, the commander designated for such purpose by the commandant of the Coast Guard.

(C) The executive director of the Marine Fisheries Commission for the geographical area concerned, if any, or his designee.

(D) One representative of the Department of State designated for such purpose by the Secretary of State, or his designee.

(2) The Pacific Council shall have one additional nonvoting member who shall be appointed by, and serve at the pleasure of, the Governor of Alaska.

(d) COMPENSATION AND EXPENSES.—The voting members of each Council, who are not employed by the Federal Government or any State or local government, shall receive compensation at the daily rate for GS-18 of the General Schedule when engaged in the actual performance of duties for such Council. The voting members of each Council, any nonvoting member described in subsection (c)(1)(C), and the nonvoting member appointed pursuant to subsection (c)(2) shall be reimbursed for actual expenses incurred in the performance of such duties. 5 USC 5332 note.

(e) TRANSACTION OF BUSINESS.—

(1) A majority of the voting members of any Council shall constitute a quorum, but one or more such members designated by the Council may hold hearings. All decisions of any Council shall be by majority vote of the voting members present and voting.

(2) The voting members of each Council shall select a Chairman for such Council from among the voting members.

(3) Each Council shall meet in the geographical area concerned at the call of the Chairman or upon the request of a majority of its voting members.

(4) If any voting member of a Council disagrees with respect to any matter which is transmitted to the Secretary by such Council, such member may submit a statement to the Secretary setting forth the reasons for such disagreement.

(f) STAFF AND ADMINISTRATION.—

(1) Each Council may appoint, and assign duties to, an executive director and such other full- and part-time administrative employees as the Secretary determines are necessary to the performance of its functions.

(2) Upon the request of any Council, and after consultation with the Secretary, the head of any Federal agency is authorized to detail to such Council, on a reimbursable basis, any of the personnel of such agency, to assist such Council in the performance of its functions under this Act.

(3) The Secretary shall provide to each Council such administrative and technical support services as are necessary for the effective functioning of such Council.

(4) The Administrator of General Services shall furnish each Council with such offices, equipment, supplies, and services as he is authorized to furnish to any other agency or instrumentality of the United States.

(5) The Secretary and the Secretary of State shall furnish each Council with relevant information concerning foreign fishing and international fishery agreements.

(6) Each Council shall determine its organization, and prescribe its practices and procedures for carrying out its functions under this Act, in accordance with such uniform standards as are prescribed by the Secretary. Each Council shall publish and make available to the public a statement of its organization, practices, and procedures.

(7) The Secretary shall pay—

(A) the compensation and expenses provided for in subsection (d);

(B) appropriate compensation to employees appointed under paragraph (1);

(C) the amounts required for reimbursement of other Federal agencies under paragraphs (2) and (4);

(D) the actual expenses of the members of the committees and panels established under subsection (g); and

(E) such other costs as the Secretary determines are necessary to the performance of the functions of the Councils.

(g) COMMITTEES AND PANELS.—

(1) Each Council shall establish and maintain, and appoint the members of, a scientific and statistical committee to assist it in the development, collection, and evaluation of such statistical, biological, economic, social, and other scientific information as is relevant to such Council's development and amendment of any fishery management plan.

(2) Each Council shall establish such other advisory panels as are necessary or appropriate to assist it in carrying out its functions under this Act.

(h) FUNCTIONS.—Each Council shall, in accordance with the provisions of this Act—

Fishery management plan.

(1) prepare and submit to the Secretary a fishery management plan with respect to each fishery within its geographical area of authority and, from time to time, such amendments to each such plan as are necessary;

Comments.

(2) prepare comments on any application for foreign fishing transmitted to it under section 204(b)(4)(B), and any fishery management plan or amendment transmitted to it under section 304(c)(2);

Public hearings.

(3) conduct public hearings, at appropriate times and in appropriate locations in the geographical area concerned, so as to allow all interested persons an opportunity to be heard in the development of fishery management plans and amendments to such plans, and with respect to the administration and implementation of the provisions of this Act;

Reports.

(4) submit to the Secretary—

(A) a report, before February 1 of each year, on the Council's activities during the immediately preceding calendar year,

(B) such periodic reports as the Council deems appropriate, and

(C) any other relevant report which may be requested by the Secretary;

Review.

(5) review on a continuing basis, and revise as appropriate, the assessments and specifications made pursuant to section 303(a)(3) and (4) with respect to the optimum yield from, and the total allowable level of foreign fishing in, each fishery within its geographical area of authority; and

(6) conduct any other activities which are required by, or provided for in, this Act or which are necessary and appropriate to the foregoing functions.

SEC. 303. CONTENTS OF FISHERY MANAGEMENT PLANS. 16 USC 1853.

(a) REQUIRED PROVISIONS.—Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, shall—

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are—

(A) necessary and appropriate for the conservation and management of the fishery;

(B) described in this subsection or subsection (b), or both; and

(C) consistent with the national standards, the other provisions of this Act, and any other applicable law;

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interests in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

(4) assess and specify—

(A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3), and

(B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and

(5) specify the pertinent data which shall be submitted to the Secretary with respect to the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, and number of hauls.

(b) DISCRETIONARY PROVISIONS.—Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may—

(1) require a permit to be obtained from, and fees to be paid to, the Secretary with respect to any fishing vessel of the United States fishing, or wishing to fish, in the fishery conservation zone, or for anadromous species or Continental Shelf fishery resources beyond such zone;

(2) designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

(3) establish specified limitations on the catch of fish (based on area, species, size, number, weight, sex, incidental catch, total biomass, or other factors), which are necessary and appropriate for the conservation and management of the fishery;

(4) prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement of the provisions of this Act;

(5) incorporate (consistent with the national standards, the other provisions of this Act, and any other applicable law) the relevant fishery conservation and management measures of the coastal States nearest to the fishery;

(6) establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account—

(A) present participation in the fishery,

(B) historical fishing practices in, and dependence on, the fishery,

(C) the economics of the fishery,

(D) the capability of fishing vessels used in the fishery to engage in other fisheries,

(E) the cultural and social framework relevant to the fishery, and

(F) any other relevant considerations; and

(7) prescribe such other measures, requirements, or conditions and restrictions as are determined to be necessary and appropriate for the conservation and management of the fishery.

(c) PROPOSED REGULATIONS.—Any Council may prepare any proposed regulations which it deems necessary and appropriate to carry out any fishery management plan, or any amendment to any fishery management plan, which is prepared by it. Such proposed regulations shall be submitted to the Secretary, together with such plan or amendment, for action by the Secretary pursuant to sections 304 and 305.

(d) CONFIDENTIALITY OF STATISTICS.—Any statistics submitted to the Secretary by any person in compliance with any requirement under subsection (a)(5) shall be confidential and shall not be disclosed except when required under court order. The Secretary shall, by regulation, prescribe such procedures as may be necessary to preserve such confidentiality, except that the Secretary may release or make public any such statistics in any aggregate or summary form which does not directly or indirectly disclose the identity or business of any person who submits such statistics.

16 USC 1854.

SEC. 304. ACTION BY THE SECRETARY.

(a) ACTION BY THE SECRETARY AFTER RECEIPT OF PLAN.—Within 60 days after the Secretary receives any fishery management plan, or any amendment to any such plan, which is prepared by any Council, the Secretary shall—

(1) review such plan or amendment pursuant to subsection (b); and

(2) notify such Council in writing of his approval, disapproval, or partial disapproval of such plan or amendment.

In the case of disapproval or partial disapproval, the Secretary shall include in such notification a statement and explanation of the Secretary's objections and the reasons therefor, suggestions for improvement, a request to such Council to change such plan or amendment to satisfy the objections, and a request to resubmit the plan or amendment, as so modified, to the Secretary within 45 days after the date on which the Council receives such notification.

(b) REVIEW BY THE SECRETARY.—The Secretary shall review any fishery management plan, and any amendment to any such plan, prepared by any Council and submitted to him to determine whether

it is consistent with the national standards, the other provisions of this Act, and any other applicable law. In carrying out such review, the Secretary shall consult with—

(1) the Secretary of State with respect to foreign fishing; and

(2) the Secretary of the department in which the Coast Guard is operating with respect to enforcement at sea.

(c) PREPARATION BY THE SECRETARY.—(1) The Secretary may prepare a fishery management plan, with respect to any fishery, or any amendment to any such plan, in accordance with the national standards, the other provisions of this Act, and any other applicable law, if—

(A) the appropriate Council fails to develop and submit to the Secretary, after a reasonable period of time, a fishery management plan for such fishery, or any necessary amendment to such a plan, if such fishery requires conservation and management; or

(B) the Secretary disapproves or partially disapproves any such plan or amendment, and the Council involved fails to change such plan or amendment in accordance with the notification made under subsection (a)(2).

In preparing any such plan or amendment, the Secretary shall consult with the Secretary of State with respect to foreign fishing and with the Secretary of the department in which the Coast Guard is operating with respect to enforcement at sea.

(2) Whenever, pursuant to paragraph (1), the Secretary prepares a fishery management plan or amendment, the Secretary shall promptly transmit such plan or amendment to the appropriate Council for consideration and comment. Within 45 days after the date of receipt of such plan or amendment, the appropriate Council may recommend, to the Secretary, changes in such plan or amendment, consistent with the national standards, the other provisions of this Act, and any other applicable law. After the expiration of such 45-day period, the Secretary may implement such plan or amendment pursuant to section 305.

(3) Notwithstanding paragraph (1), the Secretary may not include in any fishery management plan, or any amendment to any such plan, prepared by him, a provision establishing a limited access system described in section 303(b)(6), unless such system is first approved by a majority of the voting members, present and voting, of each appropriate Council.

(d) ESTABLISHMENT OF FEES.—The Secretary shall by regulation establish the level of any fees which are authorized to be charged pursuant to section 303(b)(1). Such level shall not exceed the administrative costs incurred by the Secretary in issuing such permits. Regulations.

(e) FISHERIES RESEARCH.—The Secretary shall initiate and maintain a comprehensive program of fishery research to carry out and further the purposes, policy, and provisions of this Act. Such program shall be designed to acquire knowledge and information, including statistics, on fishery conservation and management, including, but not limited to, biological research concerning the interdependence of fisheries or stocks of fish, the impact of pollution on fish, the impact of wetland and estuarine degradation, and other matters bearing upon the abundance and availability of fish.

(f) MISCELLANEOUS DUTIES.—(1) If any fishery extends beyond the geographical area of authority of any one Council, the Secretary may—

(A) designate which Council shall prepare the fishery management plan for such fishery and any amendment to such plan; or

(B) may require that the plan and amendment be prepared jointly by the Councils concerned.

No jointly prepared plan or amendment may be submitted to the Secretary unless it is approved by a majority of the voting members, present and voting, of each Council concerned.

(2) The Secretary shall establish the boundaries between the geographical areas of authority of adjacent Councils.

16 USC 1855.

SEC. 305. IMPLEMENTATION OF FISHERY MANAGEMENT PLANS.

Publication in Federal Register.

(a) IN GENERAL.—As soon as practicable after the Secretary—

(1) approves, pursuant to section 304 (a) and (b), any fishery management plan or amendment; or

(2) prepares, pursuant to section 304(c), any fishery management plan or amendment;

the Secretary shall publish in the Federal Register (A) such plan or amendment, and (B) any regulations which he proposes to promulgate to implement such plan or amendment. Interested persons shall be afforded a period of not less than 45 days after such publication within which to submit in writing data, views, or comments on the plan or amendment, and on the proposed regulations.

Written comments.

(b) HEARING.—The Secretary may schedule a hearing, in accordance with section 553 of title 5, United States Code, on any fishery management plan, any amendment to any such plan, and any regulations to implement any such plan or amendment. If any such hearing is scheduled, the Secretary may, pending its outcome—

(A) postpone the effective date of the regulations proposed to implement such plan or amendment; or

(B) take such other action as he deems appropriate to preserve the rights or status of any person.

Regulations.

(c) IMPLEMENTATION.—The Secretary shall promulgate regulations to implement any fishery management plan or any amendment to any such plan—

(1) after consideration of all relevant matters—

(A) presented to him during the 45-day period referred to in subsection (a), and

(B) produced in any hearing held under subsection (b); and

(2) if he finds that the plan or amendment is consistent with the national standards, the other provisions of this Act, and any other applicable law.

To the extent practicable, such regulations shall be put into effect in a manner which does not disrupt the regular fishing season for any fishery.

(d) JUDICIAL REVIEW.—Regulations promulgated by the Secretary under this Act shall be subject to judicial review to the extent authorized by, and in accordance with, chapter 7 of title 5, United States Code, if a petition for such review is filed within 30 days after the date on which the regulations are promulgated; except that (1) section 705 of such title is not applicable, and (2) the appropriate court shall only set aside any such regulation on a ground specified in section 706(2) (A), (B), (C), or (D) of such title.

5 USC 701 et seq.

Emergency regulations.

(e) EMERGENCY ACTIONS.—If the Secretary finds that an emergency involving any fishery resources exists, he may—

(1) promulgate emergency regulations, without regard to subsections (a) and (c), to implement any fishery management plan, if such emergency so requires; or

(2) promulgate emergency regulations to amend any regulation which implements any existing fishery management plan, to the extent required by such emergency.

Any emergency regulation which changes any existing fishery management plan shall be treated as an amendment to such plan for the period in which such regulation is in effect. Any emergency regulation promulgated under this subsection (A) shall be published in the Federal Register together with the reasons therefor; (B) shall remain in effect for not more than 45 days after the date of such publication, except that any such regulation may be repromulgated for one additional period of not more than 45 days; and (C) may be terminated by the Secretary at any earlier date by publication in the Federal Register of a notice of termination.

Publication in Federal Register.

Publication in Federal Register.

(f) ANNUAL REPORT.—The Secretary shall report to the Congress and the President, not later than March 1 of each year, on all activities of the Councils and the Secretary with respect to fishery management plans, regulations to implement such plans, and all other activities relating to the conservation and management of fishery resources that were undertaken under this Act during the preceding calendar year.

Report to Congress and President.

(g) RESPONSIBILITY OF THE SECRETARY.—The Secretary shall have general responsibility to carry out any fishery management plan or amendment approved or prepared by him, in accordance with the provisions of this Act. The Secretary may promulgate such regulations, in accordance with section 553 of title 5, United States Code, as may be necessary to discharge such responsibility or to carry out any other provision of this Act.

Regulations.

SEC. 306. STATE JURISDICTION.

16 USC 1856.

(a) IN GENERAL.—Except as provided in subsection (b), nothing in this Act shall be construed as extending or diminishing the jurisdiction or authority of any State within its boundaries. No State may directly or indirectly regulate any fishing which is engaged in by any fishing vessel outside its boundaries, unless such vessel is registered under the laws of such State.

(b) EXCEPTION.—(1) If the Secretary finds, after notice and an opportunity for a hearing in accordance with section 554 of title 5, United States Code, that—

Notice, hearing.

(A) the fishing in a fishery, which is covered by a fishery management plan implemented under this Act, is engaged in predominately within the fishery conservation zone and beyond such zone; and

(B) any State has taken any action, or omitted to take any action, the results of which will substantially and adversely affect the carrying out of such fishery management plan;

the Secretary shall promptly notify such State and the appropriate Council of such finding and of his intention to regulate the applicable fishery within the boundaries of such State (other than its internal waters), pursuant to such fishery management plan and the regulations promulgated to implement such plan.

(2) If the Secretary, pursuant to this subsection, assumes responsibility for the regulation of any fishery, the State involved may at any time thereafter apply to the Secretary for reinstatement of its authority over such fishery. If the Secretary finds that the reasons for which he assumed such regulation no longer prevail, he shall promptly terminate such regulation.

SEC. 307. PROHIBITED ACTS.

16 USC 1857.

It is unlawful—

(1) for any person—

(A) to violate any provision of this Act or any regulation or permit issued pursuant to this Act;

(B) to use any fishing vessel to engage in fishing after the revocation, or during the period of suspension, of an applicable permit issued pursuant to this Act;

(C) to violate any provision of, or regulation under, an applicable governing international fishery agreement entered into pursuant to section 201(c);

(D) to refuse to permit any officer authorized to enforce the provisions of this Act (as provided for in section 311) to board a fishing vessel subject to such person's control for purposes of conducting any search or inspection in connection with the enforcement of this Act or any regulation, permit, or agreement referred to in subparagraph (A) or (C);

(E) to forcibly assault, resist, oppose, impede, intimidate, or interfere with any such authorized officer in the conduct of any search or inspection described in subparagraph (D);

(F) to resist a lawful arrest for any act prohibited by this section;

(G) to ship, transport, offer for sale, sell, purchase, import, export, or have custody, control, or possession of, any fish taken or retained in violation of this Act or any regulation, permit, or agreement referred to in subparagraph (A) or (C); or

(H) to interfere with, delay, or prevent, by any means, the apprehension or arrest of another person, knowing that such other person has committed any act prohibited by this section; and

(2) for any vessel other than a vessel of the United States, and for the owner or operator of any vessel other than a vessel of the United States, to engage in fishing—

(A) within the boundaries of any State; or

(B) within the fishery conservation zone, or for any anadromous species or Continental Shelf fishery resources beyond such zone, unless such fishing is authorized by, and conducted in accordance with, a valid and applicable permit issued pursuant to section 204 (b) or (c).

16 USC 1858. **SEC. 308. CIVIL PENALTIES.**

(a) ASSESSMENT OF PENALTY.—Any person who is found by the Secretary, after notice and an opportunity for a hearing in accordance with section 554 of title 5, United States Code, to have committed an act prohibited by section 307 shall be liable to the United States for a civil penalty. The amount of the civil penalty shall not exceed $25,000 for each violation. Each day of a continuing violation shall constitute a separate offense. The amount of such civil penalty shall be assessed by the Secretary, or his designee, by written notice. In determining the amount of such penalty, the Secretary shall take into account the nature, circumstances, extent, and gravity of the prohibited acts committed and, with respect to the violator, the degree of culpability, any history of prior offenses, ability to pay, and such other matters as justice may require.

(b) REVIEW OF CIVIL PENALTY.—Any person against whom a civil penalty is assessed under subsection (a) may obtain review thereof in the appropriate court of the United States by filing a notice of appeal in such court within 30 days from the date of such order and by simultaneously sending a copy of such notice by certified mail to the Secretary. The Secretary shall promptly file in such court a certified copy of the record upon which such violation was found

or such penalty imposed, as provided in section 2112 of title 28, United States Code. The findings and order of the Secretary shall be set aside by such court if they are not found to be supported by substantial evidence, as provided in section 706(2) of title 5, United States Code.

(c) ACTION UPON FAILURE TO PAY ASSESSMENT.—If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order, or after the appropriate court has entered final judgment in favor of the Secretary, the Secretary shall refer the matter to the Attorney General of the United States, who shall recover the amount assessed in any appropriate district court of the United States. In such action, the validity and appropriateness of the final order imposing the civil penalty shall not be subject to review.

(d) COMPROMISE OR OTHER ACTION BY SECRETARY.—The Secretary may compromise, modify, or remit, with or without conditions, any civil penalty which is subject to imposition or which has been imposed under this section.

SEC. 309. CRIMINAL OFFENSES. 16 USC 1859.

(a) OFFENSES.—A person is guilty of an offense if he commits any act prohibited by—

(1) section 307(1) (D), (E), (F), or (H); or

(2) section 307(2).

(b) PUNISHMENT.—Any offense described in subsection (a)(1) is punishable by a fine of not more than $50,000, or imprisonment for not more than 6 months, or both; except that if in the commission of any such offense the person uses a dangerous weapon, engages in conduct that causes bodily injury to any officer authorized to enforce the provisions of this Act (as provided for in section 311), or places any such officer in fear of imminent bodily injury, the offense is punishable by a fine of not more than $100,000, or imprisonment for not more than 10 years, or both. Any offense described in subsection (a)(2) is punishable by a fine of not more than $100,000, or imprisonment for not more than 1 year, or both.

(c) JURISDICTION.—There is Federal jurisdiction over any offense described in this section.

SEC. 310. CIVIL FORFEITURES. 16 USC 1860.

(a) IN GENERAL.—Any fishing vessel (including its fishing gear, furniture, appurtenances, stores, and cargo) used, and any fish taken or retained, in any manner, in connection with or as a result of the commission of any act prohibited by section 307 (other than any act for which the issuance of a citation under section 311(c) is sufficient sanction) shall be subject to forfeiture to the United States. All or part of such vessel may, and all such fish shall, be forfeited to the United States pursuant to a civil proceeding under this section.

(b) JURISDICTION OF COURTS.—Any district court of the United States which has jurisdiction under section 311(d) shall have jurisdiction, upon application by the Attorney General on behalf of the United States, to order any forfeiture authorized under subsection (a) and any action provided for under subsection (d).

(c) JUDGMENT.—If a judgment is entered for the United States in a civil forfeiture proceeding under this section, the Attorney General may seize any property or other interest declared forfeited to the United States, which has not previously been seized pursuant to this Act or for which security has not previously been obtained under subsection (d). The provisions of the customs laws relating to—

(1) the disposition of forfeited property,

(2) the proceeds from the sale of forfeited property,

(3) the remission or mitigation of forfeitures, and

(4) the compromise of claims,

shall apply to any forfeiture ordered, and to any case in which forfeiture is alleged to be authorized, under this section, unless such provisions are inconsistent with the purposes, policy, and provisions of this Act. The duties and powers imposed upon the Commissioner of Customs or other persons under such provisions shall, with respect to this Act, be performed by officers or other persons designated for such purpose by the Secretary.

(d) PROCEDURE.—(1) Any officer authorized to serve any process in rem which is issued by a court having jurisdiction under section 311 (d) shall—

(A) stay the execution of such process; or

(B) discharge any fish seized pursuant to such process;

upon the receipt of a satisfactory bond or other security from any person claiming such property. Such bond or other security shall be conditioned upon such person (i) delivering such property to the appropriate court upon order thereof, without any impairment of its value, or (ii) paying the monetary value of such property pursuant to an order of such court. Judgment shall be recoverable on such bond or other security against both the principal and any sureties in the event that any condition thereof is breached, as determined by such court.

(2) Any fish seized pursuant to this Act may be sold, subject to the approval and direction of the appropriate court, for not less than the fair market value thereof. The proceeds of any such sale shall be deposited with such court pending the disposition of the matter involved.

(e) REBUTTABLE PRESUMPTION.—For purposes of this section, it shall be a rebuttable presumption that all fish found on board a fishing vessel which is seized in connection with an act prohibited by section 307 were taken or retained in violation of this Act.

16 USC 1861.

SEC. 311. ENFORCEMENT.

(a) RESPONSIBILITY.—The provisions of this Act shall be enforced by the Secretary and the Secretary of the department in which the Coast Guard is operating. Such Secretaries may, by agreement, on a reimbursable basis or otherwise, utilize the personnel, services, equipment (including aircraft and vessels), and facilities of any other Federal agency, including all elements of the Department of Defense, and of any State agency, in the performance of such duties. Such Secretaries shall report semiannually, to each committee of the Congress listed in section 203(b) and to the Councils, on the degree and extent of known and estimated compliance with the provisions of this Act.

Reports to congressional committees.

(b) POWERS OF AUTHORIZED OFFICERS.—Any officer who is authorized (by the Secretary, the Secretary of the department in which the Coast Guard is operating, or the head of any Federal or State agency which has entered into an agreement with such Secretaries under subsection (a)) to enforce the provisions of this Act may—

(1) with or without a warrant or other process—

(A) arrest any person, if he has reasonable cause to believe that such person has committed an act prohibited by section 307;

(B) board, and search or inspect, any fishing vessel which is subject to the provisions of this Act;

(C) seize any fishing vessel (together with its fishing gear, furniture, appurtenances, stores, and cargo) used or employed

in, or with respect to which it reasonably appears that such vessel was used or employed in, the violation of any provision of this Act;

(D) seize any fish (wherever found) taken or retained in violation of any provision of this Act; and

(E) seize any other evidence related to any violation of any provision of this Act;

(2) execute any warrant or other process issued by any court of competent jurisdiction; and

(3) exercise any other lawful authority.

(c) ISSUANCE OF CITATIONS.—If any officer authorized to enforce the provisions of this Act (as provided for in this section) finds that a fishing vessel is operating or has been operated in violation of any provision of this Act, such officer may, in accordance with regulations issued jointly by the Secretary and the Secretary of the department in which the Coast Guard is operating, issue a citation to the owner or operator of such vessel in lieu of proceeding under subsection (b). If a permit has been issued pursuant to this Act for such vessel, such officer shall note the issuance of any citation under this subsection, including the date thereof and the reason therefor, on the permit. The Secretary shall maintain a record of all citations issued pursuant to this subsection.

(d) JURISDICTION OF COURTS.—The district courts of the United States shall have exclusive jurisdiction over any case or controversy arising under the provisions of this Act. In the case of Guam, and any Commonwealth, territory, or possession of the United States in the Pacific Ocean, the appropriate court is the United States District Court for the District of Guam, except that in the case of American Samoa, the appropriate court is the United States District Court for the District of Hawaii. Any such court may, at any time—

(1) enter restraining orders or prohibitions;

(2) issue warrants, process in rem, or other process;

(3) prescribe and accept satisfactory bonds or other security; and

(4) take such other actions as are in the interest of justice.

(e) DEFINITION.—For purposes of this section—

(1) The term "provisions of this Act" includes (A) any regulation or permit issued pursuant to this Act, and (B) any provision of, or regulation issued pursuant to, any international fishery agreement under which foreign fishing is authorized by section 201 (b) or (c), with respect to fishing subject to the exclusive fishery management authority of the United States.

(2) The term "violation of any provision of this Act" includes (A) the commission of any act prohibited by section 307, and (B) the violation of any regulation, permit, or agreement referred to in paragraph (1).

SEC. 312. EFFECTIVE DATE OF CERTAIN PROVISIONS. 16 USC 1857 note.

Sections 307, 308, 309, 310, and 311 shall take effect March 1, 1977.

TITLE IV—MISCELLANEOUS PROVISIONS

SEC. 401. EFFECT ON LAW OF THE SEA TREATY. 16 USC 1881.

If the United States ratifies a comprehensive treaty, which includes provisions with respect to fishery conservation and management jurisdiction, resulting from any United Nations Conference on the Law of the Sea, the Secretary, after consultation with the Secretary of State, may promulgate any amendment to the regulations promulgated under this Act if such amendment is necessary and appropriate to

conform such regulations to the provisions of such treaty, in anticipation of the date when such treaty shall come into force and effect for, or otherwise be applicable to, the United States.

SEC. 402. REPEALS.

(a) The Act of October 14, 1966 (16 U.S.C. 1091–1094), is repealed as of March 1, 1977.

(b) The Act of May 20, 1964 (16 U.S.C. 1081–1086), is repealed as of March 1, 1977.

SEC. 403. FISHERMEN'S PROTECTIVE ACT AMENDMENTS.

(a) AMENDMENTS.—The Act of August 27, 1954 (22 U.S.C. 1972), is amended—

(1) by amending section 2 thereof to read as follows:

"SEC. 2. If—

"(1) any vessel of the United States is seized by a foreign country on the basis of claims in territorial waters or the high seas which are not recognized by the United States; or

"(2) any general claim of any foreign country to exclusive fishery management authority is recognized by the United States, and any vessel of the United States is seized by such foreign country on the basis of conditions and restrictions under such claim, if such conditions and restrictions—

"(A) are unrelated to fishery conservation and management,

"(B) fail to consider and take into account traditional fishing practices of vessels of the United States,

"(C) are greater or more onerous than the conditions and restrictions which the United States applies to foreign fishing vessels subject to the exclusive fishery management authority of the United States (as established in title I of the Fishery Conservation and Management Act of 1976), or

"(D) fail to allow fishing vessels of the United States equitable access to fish subject to such country's exclusive fishery management authority;

and there is no dispute as to the material facts with respect to the location or activity of such vessel at the time of such seizure, the Secretary of State shall immediately take such steps as are necessary—

"(i) for the protection of such vessel and for the health and welfare of its crew;

"(ii) to secure the release of such vessel and its crew; and

"(iii) to determine the amount of any fine, license, fee, registration fee, or other direct charge reimbursable under section 3(a) of this Act."; and

Infra.
22 USC 1973.

(2) by amending section 3(a) thereof by inserting immediately before the last sentence thereof the following new sentence: "For purposes of this section, the term 'other direct charge' means any levy, however characterized or computed (including, but not limited to, any computation based on the value of a vessel or the value of fish or other property on board a vessel), which is imposed in addition to any fine, license fee, or registration fee."

22 USC 1972 note.
22 USC 1973 note.

(b) EFFECTIVE DATE.—The amendment made by subsection (a)(1) shall take effect March 1, 1977. The amendment made by subsection (a)(2) shall apply with respect to seizures of vessels of the United States occurring on or after December 31, 1974.

SEC. 404. MARINE MAMMAL PROTECTION ACT AMENDMENT.

(a) AMENDMENT.—Section 3(15)(B) of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1362(15)(B)) is amended by striking

out "the fisheries zone established pursuant to the Act of October 14, 1966." and inserting in lieu thereof "the waters included within a zone, contiguous to the territorial sea of the United States, of which the inner boundary is a line coterminous with the seaward boundary of each coastal State, and the outer boundary is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured.".

(b) EFFECTIVE DATE.—The amendment made by subsection (a) shall take effect March 1, 1977. 16 USC 1362 note.

SEC. 405. ATLANTIC TUNAS CONVENTION ACT AMENDMENT.

(a) AMENDMENT.—Section 2(4) of the Atlantic Tunas Convention Act of 1975 (16 U.S.C. 971(4)) is amended by striking out "the fisheries zone established pursuant to the Act of October 14, 1966 (80 Stat. 908; 16 U.S.C. 1091–1094)," and inserting in lieu thereof "the waters included within a zone, contiguous to the territorial sea of the United States, of which the inner boundary is a line coterminous with the seaward boundary of each coastal State, and the outer boundary is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured,".

(b) EFFECTIVE DATE.—The amendment made by subsection (a) shall take effect March 1, 1977. 16 USC 971 note.

SEC. 406. AUTHORIZATION OF APPROPRIATIONS. 16 USC 1882.

There are authorized to be appropriated to the Secretary, for purposes of carrying out the provisions of this Act, not to exceed the following sums:

(1) $5,000,000 for the fiscal year ending June 30, 1976.

(2) $5,000,000 for the transitional fiscal quarter ending September 30, 1976.

(3) $25,000,000 for the fiscal year ending September 30, 1977.

(4) $30,000,000 for the fiscal year ending September 30, 1978.

Approved April 13, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 94-445 (Comm. on Merchant Marine and Fisheries) and No. 94-948 (Comm. of Conference).
SENATE REPORTS: No. 94-416 (Comm. on Commerce), No. 94-459 (Comm. on Foreign Relations), and No. 94-515 (Comm. on Armed Services) all accompanying S. 961, and No. 94-711 (Comm. of Conference).
CONGRESSIONAL RECORD:
Vol. 121 (1975): Oct. 9, considered and passed House.
Dec. 19, S. 961 considered in Senate.
Vol. 122 (1976): Jan. 19-22, 27, S. 961 considered in Senate.
Jan. 28, considered and passed Senate, amended, in lieu of S. 961.
Mar. 29, Senate agreed to conference report.
Mar. 30, House agreed to conference report.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:
Vol. 12, No. 16 (1976): Apr. 13, Presidential statement.