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**the
McKERNAN
lectures**

Extended National Fisheries Jurisdiction

palliative or panacea?

Roy Jackson



Donald L. McKernan Lectures in Marine Affairs

**Extended
National Fisheries
Jurisdiction**
palliative or panacea?

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May 26-28, 1981

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The McKernan Lectures:

Pacific Salmon
Scenarios for the Future
By Peter Larkin

Should We Cut Our LOSes?
U.S. Foreign Policy and International Regimes
By Joseph S. Nye

Extended National Fisheries Jurisdiction
Palliative or Panacea?
by Roy I. Jackson

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Foreword

The McKernan Lecture Series was established in memory of Donald L. McKernan, first Director of the University of Washington's Institute for Marine Studies.

Previous lectures concerned future scenarios for management of Pacific salmon (Peter Larkin, University of British Columbia) and law of the sea policy questions (Joseph S. Nye, Harvard University). These lectures have been published and are available through the Washington Sea Grant Program.

The third lectures in the series were presented by Roy I. Jackson, a man of extensive experience with international fishery problems and institutions, and most recently Deputy Director General of the Food and Agriculture Organization of the United Nations. That organization has long been concerned with fisheries as important sources of high-quality food, and with the interests of the developing countries in learning how to utilize these resources most effectively.

In recent years, coastal nations have extended their control over nearby living marine resources; and as a consequence of the continuing law of the sea negotiations, most countries have now claimed fishery jurisdiction out to 200 miles offshore. Nearly all fish are now caught within these national zones. Thus the problem of international management of these resources has been dramatically transformed, and countries with little experience or technical competence in fisheries management find themselves responsible for vast resources.

These are the questions addressed by Roy Jackson as he considers whether extended national fisheries jurisdiction is a palliative or a panacea.

Warren S. Wooster

May 26, 1981

Preface

When Professors Warren Wooster and Edward Miles of the Institute for Marine Studies at the University of Washington asked me to give two lectures as part of a continuing memorial to Don McKernan, my first reaction was one of profound and distressed regret—regret that it was necessary to speak in the past tense about anybody so vigorous, so dynamic, so totally involved, and so totally alive as Don. We had been friends since our days as undergraduates in the College of Fisheries at the University of Washington many years ago. Although we had never worked in direct association, Don's large and numerous orbits had intersected mine at many places and times over the years. Indeed, when I left Rome in 1979, a year after retiring from the Food and Agriculture Organization (FAO), my decision to return to Seattle was based in large part on the anticipation of working with Don in new ventures in the field of fisheries. During the 35 years that my wife and I lived outside of the United States, we were in constant and frequent contact with Don and his family, and we still number the members of his family among our close and continuing friends.

Since my whole professional life from undergraduate employment through to my retirement from the Food and Agriculture Organization in 1978 was spent in the field of international fisheries, it is possible that I knew Don from a somewhat different perspective than many of you. I know that he played a large, dedicated, and effective role in national fisheries. Let me add that he was equally visible, audible, and influential on the international stage.

As a matter of fact, my appointment in 1964 to head the fisheries activities of the Food and Agriculture Organization of the United Nations came about because of a recommendation by Don that arose from discussions we held in a Tokyo hotel room the year before, while we were relaxing between sessions of the International North Pacific Fisheries Commission. As Peter Larkin said in last year's McKernan Lectures, Don spoke well and convincingly. He was never in doubt about the cause for which he was an advocate nor about the greatness of the country he represented. Over the many years that I knew him, first in the North Pacific arena and then in the world framework of FAO, he was a relentless proponent of what he knew to be right and an unfailing friend, even in the midst of what he always intended as constructive criticism.

As I undertake these lectures, to give you my personal interpretation and reflections on the transition to extended fisheries jurisdiction, I feel a deep regret that Don is not here to take part and to continue to play his role in this changing scene he knew and loved so well.

Although the opinions, interpretations, and reflections in these lectures are my own responsibility, I am grateful to the following friends and colleagues who have generously supplied current documents and information: Kenneth C. Lucas, Jean Carroz, and Erdogan Akyüz of the Department of Fisheries, FAO, Rome; Professor Edward Miles, Institute for Marine Studies, and Professor William T. Burke, School of Law, both of the University of Washington; and J. Carl Mundt of Seattle, lawyer and legal consultant.

**Extended
National Fisheries
Jurisdiction**
palliative or panacea?

Introduction

In recent years, and particularly in the last decade, nearly all countries fronting on the sea have pushed their jurisdiction seaward. Most have gone to 200 miles, some to a median line, a few have established only a 12-mile territorial sea jurisdiction. In addition a very few, to my surprise, remain at 3 miles of total jurisdiction.

I do not intend to go far into the details of variations of extended jurisdiction over the sea and seabed. The process is still going on, but the significant changes have already been made—significant because, according to various experts, 99 percent of the marine fish caught today are taken *inside* the jurisdiction of one country or another. A new area equal to the total land area of the earth has come under a greater or lesser degree of national sovereignty. The consequences of that almost incomprehensible increase cannot yet be seen clearly, but they will be profound and they may even be the forerunner of further extensions. What I do intend is to look at the consequences of extended fisheries jurisdiction in a general way, to see how and where it happened, where it seems to be going, and then to look at a few specific cases before drawing some personal conclusions.

I remember hearing Ambassador Arvid Pardo of Malta speaking just a few years ago to an early session of the still-continuing Third United Nations Conference on the Law of the Sea (UNCLOS 3). The Ambassador spoke movingly and at length, advocating common property ownership and international responsibility for the sea and the seabed and their resources. He described them always as “the common heritage of mankind.” It is ironic that one of the most tangible results of the Third Conference to date has been to create an awareness that has led nearly every country to extend its national sea boundaries before they could be set by international convention.

Of course, the Third Conference continues. Although it seemed close to reaching the signature stage earlier this year, it now waits while the United States reexamines its position on seabed mining. However, no one foresees much change in the position on extended fisheries jurisdiction, which is now established in the national laws of nearly every coastal state. Some countries have opted for 200 miles of territorial sea, some for 200 miles of exclusive economic zone (EEZ), some for 200 miles of extended fishery jurisdiction (EFZ), and a small number of states have chosen other variations of jurisdiction and sovereignty. There seems to be general agreement that whether or not a comprehensive Law of the Sea Agreement is ever completed, signed, and ratified, the great change in fisheries jurisdiction is already an accomplished fact.

In this discussion, I will first look at the state of world fisheries. I will then look at a few case histories and at what extended limits mean to selected countries at this early stage of change. Next, I will look at the changes that are taking place in an area with which I have been concerned as a partner in a consulting firm for the past year—the 200-mile North Pacific fishery conservation and management zone established by the United States. Finally, I will see what conclusions can be drawn so soon after the

Table 1
World catch of marine fish
1970-1979

Year	Catch in metric tons
1970	59,485,000
1971	59,825,500
1972	55,631,000
1973	56,035,800
1974	59,741,300
1975	59,293,800
1976	62,756,300
1977	61,806,200
1978	63,421,100
1979	63,806,500
Average	60,181,250

Source: *Yearbook of Fishery Statistics* (Rome: Food and Agriculture Organization, United Nations, 1979)

Table 2
Catches of marine fish
by top twenty countries
1979

Rank/Country	Catch in metric tons
1. Japan	9,736,090
2. USSR	8,308,375
3. Peru	3,667,237
4. United States	3,445,170
5. China	2,938,420
6. Norway	2,651,561
7. Chile	2,632,615
8. South Korea	2,121,252
9. Denmark	1,721,392
10. Iceland	1,644,340
11. Thailand	1,566,441
12. India	1,494,855
13. Indonesia	1,299,231
14. Canada	1,282,398
15. North Korea	1,264,000
16. Spain	1,180,090
17. Philippines	1,132,374
18. Mexico	846,233
19. Vietnam	837,200
20. France	732,154
Total of above	50,501,448 (79.15%)
Total all others	13,305,052 (20.85%)
World total	63,806,500 (100.00%)

Source: *Yearbook of Fishery Statistics* (Rome: Food and Agriculture Organization, United Nations, 1979), Table A-4.

great change in the regime of the oceans. Is extended jurisdiction really a panacea—a universal cure—or is it a palliative—relieving the symptoms without actually curing?

Where Are We Today?

Before looking at what extended jurisdiction has meant to a variety of countries, it will be useful as background to look at a few facts regarding the world catch of fish. For all practical purposes, that catch—or 99 percent of it (the exceptions being a few tunas and tuna-like species)—is caught within one or another national jurisdiction. Some statistics from FAO show a relatively stable world catch of *marine* fish in recent years. In recent years, the rate of increase has slowed markedly. The average marine catch for the

Table 3

**Fishing vessels, floating factories, and fish carriers
of over 100 gross registered tons for the twenty leading countries.
(Arranged by 1980 ranking in thousands of GRT)**

Rank/Country	1969	1974	1979	1980	Ratio 1980/1969	Percent of world total 1980
1. USSR	3,405	5,610	6,514	6,678	1.96	52.0
2. Japan	389	1,256	1,061	1,107	2.35	8.6
3. Spain	409	510	569	558	1.36	4.3
4. United States	61	358	464	524	8.59	4.1
5. S. Korea	45	147	327	361	8.02	2.8
6. Poland	221	271	355	354	1.60	2.7
7. Norway	179	204	243	240	1.34	1.9
8. Romania	18	96	170	182	10.11	1.4
9. E. Germany	138	147	173	173	1.25	1.3
10. Cuba	45	70	167	172	3.82	1.3
11. France	198	196	171	170	0.86	1.3
12. United Kingdom	240	243	170	168	0.70	1.3
13. Panama	10	60	166	161	16.10	1.2
14. Canada	126	133	145	152	1.21	1.2
15. Peru	49	125	130	138	2.82	1.1
16. Portugal	105	123	130	127	1.21	0.9
17. W. Germany	163	156	128	117	0.72	0.9
18. Netherlands	54	81	89	94	1.74	0.7
19. Iceland	63	82	91	93	1.46	0.7
20. Italy	75	90	86	86	1.15	0.7
Total of above	5,933	9,960	11,369	11,655	1.94	90.4
Total all others	941	723	1,075	1,188	1.32	9.6
World total	6,934	10,683	12,444	12,843	1.85	100.0

Source: *Lloyds' Register of Shipping*, Statistical Tables (London: Wyman and Sons, 1969, 1974, 1979, 1980).

10 years shown in Table 1 is 60,181,250 metric tons per year. For the sake of comparison, the nominal catches of marine fish for 1979 by countries, listed in declining order, are shown in Table 2.

The eleven *developing* countries¹ in Table 2 took 19,799,858 metric tons (39.21 percent) of the marine catch of 1979's top twenty. On a world basis, all developing countries combined took 46.32 percent of *all* fish (marine and inland) in 1979. Their share is increasing steadily. Most of the developing countries fish almost exclusively within their own or neighboring jurisdictions, although some—South Korea, for example—operate in distant waters. The marine catches by Japan and the Soviet Union continue to lead the world, as they have for many years. In addition to heavily fishing the productive and extensive waters off their own shores, these countries epitomize distant-water fishing. In this connection, Table 3 which shows the total tonnage of fishing vessels, floating factories, and fish carriers for the twenty leading countries in 1969, 1974, 1979, and 1980, is of interest.

These data show that more than half (52.0 percent) of the world's tonnage of fishing vessels of 100 gross registered tons (GRT) or over belonged to the Soviet Union in 1980. The Soviet fleet of this size category in 1980 comprised 3,963 fishing vessels (including factory trawlers), averaging 931 GRT and totalling 3,688,674 GRT. In addition, the fish factories and carriers in the Soviet fleet in 1980 totalled 601 vessels, averaging 4,974 GRT with a total tonnage of 2,989,166 GRT. In numbers of fishing and support vessels of 100 GRT or over, the USSR had 4,564 in 1980, which was 21.2 percent of the world total number of vessels above 100 GRT (21,541).² A statistic of particular significance, useful in obtaining an overview of distant-water fishing effort by the USSR, can be obtained from looking at Lloyds' figures for floating fish factories and carriers for 1980. In that year the USSR had 601 or 69.1 percent of the total number of 870 such vessels in the world. In tonnage the USSR had 2,989,166 out of 3,647,806 GRT (81.9 percent) of the world fleet of floating factories and carriers.

Looking at a similar breakdown of data for Japan from the same source, we find that country a distant second to the USSR. The Japanese fleet of fishing vessels, factory trawlers, floating factories, and carriers of over 100 GRT each numbered 2,989 vessels in 1980, which was 13.9 percent of the world total of 21,541 such vessels. The Japanese fleet in 1980 consisted of 122 floating factories and carriers, which was 14.0 percent of the world total number of 870 such vessels. In tonnage these vessels averaged 1,580 GRT. For comparison, the 601 factories and carriers owned by the USSR in 1980 averaged 4,974 GRT, over three times larger than those of Japan. Japan's fishing vessels of over 100 GRT, including factory trawlers, numbered 2,867 in 1980. This was 13.87 percent of the world's total of 20,671 such vessels in 1980.³ In size, the Japanese fishing vessels of over 100 GRT averaged 319 GRT in 1980. This is appreciably smaller than the world average of 445 GRT for such vessels and much smaller than the USSR average of 931 GRT for its fishing vessels and factory trawlers of the over 100 GRT size.

A variety of tentative or speculative conclusions can be drawn from data such as these. For the purpose of this examination, however, it will be enough to look at the information in the light of the worldwide establishment of extended jurisdiction over fisheries. First of all, the world catch of marine fish has been stable in recent years—the trend is slowly upward, but is certainly not climbing in proportion to increases in effort and efficiency of capture. Second, the share of developing countries in the total world catch is rising slowly, from 41.2 percent in 1973 to 46.3 percent in 1979.⁴ Third, by 1980, virtually all the world's supply of fish (with some exception for the tunas) was taken inside fishing zones under single national jurisdiction. Fourth, judging from the statistics on world fishing fleets and related catches, the extension of jurisdiction has yet to reduce the distant-water fishing activities of some nations, even if the fleets and catches of several Western European nations are declining.

If one combines data for three well-known distant-water fishing nations—the USSR, Japan, and South Korea—one finds some interesting information.⁵ These countries combined took 31.6 percent of the world marine catch or 20,165,717 metric tons in 1979. To do so, they utilized 7,363 vessels

of over 100 GRT, or 34.2 percent in number of vessels, or 63.2 percent of the world total tonnage of such vessels. A tentative conclusion may be that fishing in other nations' jurisdictions is alive and well. Other data, not discussed here—mainly the increase of joint ventures, foreign fishing allocations and the like—support this conclusion.

It can be said that vessels of 100 GRT or over are being used in the coastal fisheries. Certainly this is true to some extent; but vessels of the size, range, power, and sea-keeping ability of those listed for Japan, the USSR, and South Korea are obviously intended largely for fishing far away from home ports. Remembering that 99 percent of marine fish now being caught are taken within one or another national jurisdiction, it seems a reasonable conclusion that fishing within the extended fisheries jurisdiction zones of distant countries continued at least for the immediate past, and that such access must be of major importance to the great fishing nations.

Next, I will discuss the present stage in the evolution of extended jurisdiction over fisheries, noting the historical basis and the current status of the Law of the Sea. I will make some comments on trends and then look at some examples of what extended jurisdiction has done, or not done, for the present or potential fisheries of several countries.

The Current Status of Extended Fisheries Jurisdiction

Extension of national jurisdiction over offshore fisheries began long before the First Conference on the Law of the Sea was convened. In fact, or at least in some opinions, including mine, the First Conference (Geneva, 1958), the Second Conference (Geneva, 1960), and the Third Conference (peripatetic, 1974-?) were convened largely to halt, and if possible to reverse, the steady drift seaward of territorial sovereignty that began in Latin America in the 1940s. The first LOS Conference did not reach any agreement on the extent of the territorial sea, which, as we all know, had been kept at 3 miles (with a few exceptions) for several centuries by the great maritime powers. The Second Conference (Geneva, 1960) failed by one vote to adopt a so-called 6+6 (6 miles of territorial sea plus an outer 6-mile band of fisheries jurisdiction). A story current at the time has the delegate of a country friendly to the United States committed to support the then-U.S. 6+6 position; however he became confused and voted the wrong way by mistake! Who knows where we might be now if 6+6 had passed. In my opinion, we would be about where we are today; extended jurisdiction was an idea whose time had come. But if 6+6 had passed and gained some ratifications, it would have impeded the world rush to extend limits.

Some tabular material here will be both illustrative and time-saving and will form the basis for some general statements and conclusions.

First of all, Table 4 indicates that of the fourteen countries claiming a 200-mile territorial sea, ten took the action in 1972 or earlier, before there was an opportunity for a lesser limit to find support at UNCLOS 3, which

Table 4
The fourteen countries
claiming a 200-mile
territorial sea

Country and Year of Entry into Force	
Peru	1947
El Salvador	1950
Guinea	1965
Ecuador	1966
Argentina	1967
Panama	1967
Uruguay	1969
Brazil	1970
Sierra Leone	1971
Somalia	1972
Benin	1976
Liberia	1976
Congo	1977
Ghana	1977

Source: Gerald Moore, *Legislation on Coastal State Requirements for Foreign Fishing* (Rome: Food and Agriculture Organization, United Nations, Legislative Study No. 21, 1981), Table A.

Table 5
Numbers of countries
claiming various limits
of territorial sea April 1981

Countries	Limit Claim
22	3 nautical miles
3	4 nautical miles
5	6 nautical miles
80	12 nautical miles
1	15 nautical miles
1	20 nautical miles
1	30 nautical miles
3	50 nautical miles
1	70 nautical miles
1	100 nautical miles
1	150 nautical miles
14	200 nautical miles
5	Miscellaneous (geographical coordinates, etc.)

138* Total number of countries

*Dependent territories of New Zealand (3 at 12 miles) and of the United Kingdom (11 at 3 miles) omitted.

Source: Gerald Moore, *Legislation on Coastal State Requirements for Foreign Fishing* (Rome: Food and Agriculture Organization, United Nations, Legislative Study No. 21, 1981).

held its first session in 1973. To this list might be added Gabon, which asserted a 100-nautical-mile territorial sea in 1972, and Tanzania, which established 50 miles in 1973. In fact, it might be said that all territorial sea limits beyond 3 miles preempt decisions of UNCLOS 3 which have not yet been voted or signed, let alone ratified.

As of April 1981, data from FAO indicate the situation shown in Table 5 regarding the limits of the territorial sea for 138 countries. A large majority of countries (111) claimed a territorial sea of more than 3 miles; 5 countries claimed miscellaneous limits, leaving only 22 still claiming the traditional 3 miles.⁶

The fourteen countries listed in Table 4 as claiming more or less absolute sovereignty over a 200-mile territorial sea include total jurisdiction over fisheries in their national legislation. But in addition, countries claiming extended fisheries or economic zones, even though they have territorial seas of 3 miles or 12 miles or some other small distance, are a major subject of interest. For my purposes, it does not matter very much if a country claims exclusive jurisdiction only over fisheries or if it has declared an exclusive economic zone (EEZ) along the lines set out in the Informal Composite Negotiating Text⁷ that forms the current basis and draft output of UNCLOS 3. In the latter case, a state usually asserts sovereign rights to all resources,

Table 6
Numbers of nations having various jurisdictions over fisheries
April 1981

Kind of Jurisdiction	Number of Countries
200-mile territorial sea	14
200-mile exclusive economic zone	49
200-mile extended fishery zone	26
100-mile territorial sea	1
Median line	4
Outer edge of continental shelf	2
50-mile territorial sea	3
24-mile extended fishery zone	1
15-mile territorial sea	1
12-mile territorial sea	23
12-mile extended fishery zone	3
6-mile territorial sea	2
6-mile extended fishery zone	1
3-mile territorial sea	6
Geographical coordinates	2
Total number of countries	138

Note: Countries are classified by their maximum extension of jurisdiction.

Source: Gerald Moore, *Legislation on Coastal State Requirements for Foreign Fishing* (Rome: Food and Agriculture Organization, United Nations, Legislative Study No. 21, 1981).

whether living or nonliving, of the seabed and subsoil and superjacent waters. The point to be considered is national control over fisheries in an extended area. It is true that an EEZ would allow a state to charge the heavy costs (about which more later) of surveillance, monitoring, and control in vast sea areas to more accounts than fisheries alone. Oil, gas, minerals, environmental protection, research, and other activities would bear their share of costs, but in very many cases this has little practical significance at this point in history, since fisheries is the only significant economic activity (except for peaceful navigation) in most offshore jurisdictions.

Information on the current (April 1981) status of national legislation establishing exclusive fishing limits, exclusive economic zones, extended territorial sea claims, and similar information has been provided through the courtesy of the Department of Fisheries of FAO. The Food and Agriculture Organization has played an expert supporting role on fisheries matters throughout the UN Conferences on the Law of the Sea.

Again it is useful to present a table from which an overview of the current situation can be obtained. This will lend support to the statement made earlier that nations collectively have brought under their separate jurisdictions sea areas roughly equal to the land area of the earth, within which 99 percent of the world's marine fish are taken (Table 6).

Table 7
**Nations with fisheries jurisdiction
of 12 nautical miles or less**

3-mile limit	6-mile limit	12-mile limit	
Bahrain	Greece	Algeria	Monaco
Dominica	Israel	Bulgaria	Namibia
Jordan	Lebanon	China	Romania
St. Lucia		Cyprus	Sudan
St. Vincent		Egypt	Syria
Singapore		Eq. Guinea	Thailand
		Ethiopia	Trinidad and Tobago
		Finland	Tunisia
		Iraq	Turkey
		Italy	United Arab Emirates
		Jamaica	Yemen Arab Republic
		Kuwait	Yugoslavia
		Libya	Zaire

Source: Gerald Moore, *Legislation on Coastal State Requirements for Foreign Fishing* (Rome: Food and Agriculture Organization, United Nations, Legislative Study No. 21, 1981).

In order to make the point that nearly every nation with significant fisheries resources off its shores has extended its jurisdiction, it is of interest to look over the list of names of nations with fishery jurisdictions of 12 miles or less (Table 7).

It should also be borne in mind that these states, as well as others, may increase the extent of their jurisdiction at any time in the future. There is more than ample precedent, not only in the LOS draft text, but more significantly, in the legislation of the large majority of nations already claiming 200 miles. It seems a valid conclusion that every nation desiring to do so will have no significant difficulty in extending its fisheries jurisdiction to 200 miles or to a median line where this is appropriate.

Where, then, does the matter stand at this moment, 3 to 5 years after most nations have claimed jurisdiction over vast new sea areas, in many cases far exceeding their land areas? Nearly all marine fishery resources are now under one or more national jurisdictions. What is the significance of these lines drawn on maps so recently that not all disputes have even surfaced as yet? I will next discuss some case histories presenting information from various sources, nearly all of it unpublished and some of it personal. From these cases, I believe that some general observations and conclusions may be drawn, remembering always that the transition is only beginning and that lines drawn on water may signify little or nothing at all.

What Extended Fisheries Jurisdiction Means to Selected Countries

At this point in world fisheries transition, we find that 99 percent of the world's commercial marine fish catch is taken in waters under national sovereignty. Table 6 shows us that 93 nations, as of April 1981, had established limits of 50 miles or more through an extended territorial sea, a 200-mile exclusive economic zone (EEZ) or a 200-mile extended fishery zone (EFZ). Those nations that have not yet extended their fisheries jurisdiction have overwhelming precedent for doing so.

A quotation from a recent speech by K.S. Lucas, Assistant Director General in charge of FAO's worldwide fisheries program, sums up the present situation succinctly:⁸

Phase one has been accomplished. That was the transfer of the fish stocks from the cold anarchy of common property status to national ownership. Phase two, the setting up of the national management systems, has still to be tackled.

We're in a time of transition, and what happens to world fish supply in the future will depend very greatly on the calibre of our response to the challenges of this period.

The immediate problem is that most of the developing countries that control so much of the total world fish supply are not yet equipped to undertake the complex job of fisheries management. And this is perfectly understandable. Yesterday their ownership and, in most cases, their fishing activities were confined to narrow territorial seas. Now they own it all, out to 200 miles. There has been for many of the countries a quantum leap in responsibility and opportunity. Mauritania, for example, with 1.3 million people and a per capita annual income of \$163, now owns some of the richest fishing grounds in the world.

Mauritania

Mauritania, on the center of the westward bulge of Africa, lying between 16° and 2° north latitude, about the same as the southwest coast of Mexico, deserves a brief look to see what a 200-mile limit means.

A part of French West Africa until it became independent in 1960, Mauritania has 1.6 million people occupying a country that at first impression seems to be a sand beach 450 miles long and extending nearly 1,000 miles inland. Many of its nomadic desert-dwelling people are moving toward the fishing center of Nouadhibou or the capital Nouakchott. Subsistence agriculture along the Senegal River valley, which forms the southern boundary of the country, supports the bulk of the population of one of the world's least developed countries.

In 1978 Mauritania established both a 70-mile territorial sea and a 200-mile exclusive economic zone. The Atlantic waters off its shores, enriched by upwelling, are estimated by FAO to have a potential annual yield of 600,000 metric tons (MT) of fish, of which about 450,000 MT would be pelagic—mostly sardinella, horse mackerel, and mackerel. The demersal

fish potential is around 100,000 MT annually, and cephalopods have a potential of around 40,000 MT. Artisanal fishermen—using paddles, sails, motorized canoes, and man-powered beach seines—number about 1,000 and catch an estimated 40,000 tons of fish per year. The rest of the catch in Mauritania waters is even more difficult to ascertain. The FAO's statistical area 34⁹ covers an enormous expanse from Gibraltar to the mouth of the Congo River, much too large for our purpose. The 1979 catch statistics from FAO show a marine catch of 21,170 MT by Mauritania, but the figure, as explained in the standard note that applies to many countries, is an estimate by FAO—a calculation “based on specific assumptions and/or very limited information.” It has been unchanged since 1974. (No criticism of FAO is intended—it depends on nations to supply data. For that matter, no criticism of Mauritania is intended; it has higher priorities and greater needs than measuring landings of fish along an extensive, roadless, and sparsely populated shore.)

In addition to the artisanal fishing activities, Mauritania has a small “semi-industrial” fleet consisting of three small purse seiners and three trawlers operating from Nouadhibou, the only deep-water harbor in the country. However, the bulk of the catch in Mauritanian waters is taken by foreign vessels under Mauritanian license or by foreign vessels forming part of joint venture arrangements. The joint ventures include meal plants in Nouadhibou having about 265,000 metric tons of raw fish capacity per annum. These plants have been markedly short of fish for the last decade, apparently because the foreign partners have not chosen to bring sufficient fish from their catches to port.

According to FAO's Fishery Country Profile for Mauritania (June 1980), fish are one of the major economic resources of the country, although at present foreign vessels operating under license take some 85–90 percent of the total catch in Mauritania's EEZ, most of which is not landed in Mauritania.

Those who have followed this all-too-brief view of the Mauritanian fisheries situation will perhaps agree that, to date, extended jurisdiction has defined rights, raised hopes, and brought in some revenue from exports. It has also brought in substantial revenues (about \$30,000,000 annually) from licensing and fines on foreign vessels.¹⁰ Perhaps one should realistically expect no more in a country so undeveloped, so poor, so new to self-government, and so beset with political problems.

Some of the many problems in the Mauritanian fisheries sector include: lack of good knowledge of the resource base; lack of data on the catches except in the most approximate way; lack of facilities for surveillance, monitoring, and control; lack of trained and experienced people through the whole administrative, technical, and scientific structure or, for that matter, in the political structure. More general problems are those of the new nation as a whole—acute poverty, illiteracy, poor-to-abysmal communications, and other conditions leading at least to inefficiency if not to favoritism and corruption. It is true that the basic conditions exist for asserting effective ownership, management, and control—at least for those stocks not also shared with neighboring jurisdictions. But almost everything

else remains to be done. In the interim, until help arrives and jurisdiction can be meaningful, conditions are ripe for overfishing, underreporting, underpayment, and underdevelopment of national fishing. The old disease of underdevelopment is manifesting a new set of symptoms.

Mauritania's situation is representative of a number of other countries, even if somewhat exaggerated—a poorly developed, lightly populated country, richer in fisheries resources than most, with a primitive national fisheries sector, and with a multinational fishery offshore practically impossible at this stage of history to adequately understand, monitor, or control.

From here I will turn to a very different case, that of the tuna fisheries of the Western Pacific and the many island states concerned. For much of what follows, I am indebted to Professor Edward Miles. The interpretations are my own.

The Western Pacific and Its Tuna Fisheries

From the rather simple and straightforward EEZ off Mauritania, it is a long jump in every sense to the complex community of island states of the West Central and Southwest Pacific. Again some background information will help to provide a frame in which to see the fisheries picture. The Pacific Islands region extends from about 122° west to 132° east longitude and from 42° south to 22° north latitude. Its 11 million square miles cover an area more than three times as large as the United States or about as large as all Africa. It contains twenty-three island states and territories plus Australia and New Zealand. Twenty-two of the island states (all except Papua New Guinea) are small in both population and land area.

It is a characteristic of the extended economic zone phenomenon that small islands, if fortunately situated, gain proportionately much greater areas of jurisdiction than coastal states forming part of a continental land mass. For example, a circular island, 20 miles in diameter, with an area of 314 square miles, can claim, if well situated, an EEZ which, when combined with the territorial sea, would cover more than 138,000 square miles, about 440 times the land area of the hypothetical island state. (Whether so small a tail can wag so big a dog is the crux of the problem.)

A map of the huge South Pacific region shows that when the intended establishment of EEZ's is completed, the whole area on a map will look rather like a great cumulus cloud. It will be made up of many overlapping national jurisdictions with a few windows or open areas and a few circular satellite zones around isolated outer islands. Within this superficially simple overview lie at least twenty-five national jurisdictions. Except for Australia, New Zealand, and Papua New Guinea, all are small, lightly populated, new to independence and, if not poor, not rich. Their situation in fisheries is further complicated by great distances, poor communications and, above all by the fact that, other than the nearshore reef fisheries, their resources consist of highly migratory stocks of skip-jack, yellowfin, and big-eye tuna plus various billfishes and sharks.

Considering the great extent of the area, the estimated catches may seem rather small. Kearney (1979),¹¹ as quoted by Miles (1981),¹² estimated the local reef fish catch in waters of the South Pacific Commission (about

which more later) at about 56,900 metric tons per annum, using data from the years 1974 to 1979. The local tuna catch, using data for the same span of years, is placed at 41,800 MT per annum. In addition the foreign longline tuna catch in the same area was 57,160 metric tons in 1976. The Japanese fleet caught 90,280 MT of tuna by pole and line, and Japanese purse seining took an estimated 20,000 MT of tuna in 1977. If we combine the tuna figures and eliminate the shore-oriented reef fisheries from consideration, the annual catch in the South Pacific Commission area seems to be on the order of 210,000 MT per year. There are signs that the catch may be increasing, but the figure is adequate for the purpose of this discussion.

Looking at the situation in what may be simplistic terms, the area and annual catch figures yield an annual catch figure of just 7.25 kilograms of tuna per square kilometer per year (8.5 pounds per square mile per year). Obviously tuna stratify and aggregate in time and space or no fishery would exist. But it is also true that both the fish and the fishermen pursuing them are highly migratory.

Fleet size is another factor to be put into the equation for considering management implications of the EEZ in the West Central and Southwest Pacific. Such figures are not easily obtainable, being part of the problem rather than the solution. Recent figures (Miles, 1981)¹³ suggest a guess of about 1,000–1,500 vessels derived from a total fleet of about 3,000 Japanese longliners and pole and line vessels, plus an available Taiwanese fleet of about 680 longliners and a Korean fleet of about 570 vessels. In addition, a few U.S. tuna seiners are entering the area, and USSR vessels appeared in 1981. Seasonality of effort varies with species, but, according to Miles (1981),¹⁴ longline fishing effort, targeting on yellowfin and bigeye which represented 80 percent of the catch, tends to be distributed continuously throughout the year.

In summary, some of the factors that face the many small emerging island nations in their desire to manage rationally their fishery resources include: great distances and huge areas; highly migratory stocks of fish moving through many national jurisdictions; highly mobile fishing vessels searching and fishing over great areas; and limited, very limited, resources of money, trained men, ships, planes, and everything else needed to construct a sufficient monitoring, surveillance, and control system, if and when one can be planned. In addition, from a fragmented and inadequate knowledge base, the island nations face annual negotiations with representatives of foreign fishing enterprises to try to agree on annual fees and other conditions for fishing rights. Because foreign fishing is a near monopoly and because the same stock may be fished in several jurisdictions, the island states find themselves disadvantaged and, understandably, played off one against the other at successive negotiations.

Those familiar with fishery operations and control measures may raise many questions about the sketchy information given here. But two conclusions pertinent to the subject may be drawn. First, the establishment of a meshed field of extended economic zones created an environment in which the problems of management of the tuna resources of the West Central and Southwest Pacific can be tackled. Second, however, the establishment of

these areas does nothing else to actually solve the myriad of problems involved in the rational management of the fisheries of the area.

It is obvious that this complex political, scientific, and economic problem cries out for an "appropriate international organization," as contemplated in Article 64 of the Informal Composite Negotiating Text of UNCLOS 3. The language is directly pertinent: "The coastal State and other states whose nationals fish in the region for the highly migratory species listed in Annex I, shall cooperate directly or through appropriate international organizations with a view to ensuring conservation and promoting the objective of optimum utilization of such species throughout the region, both within and beyond the exclusive economic zone."

It should be recorded that the nations concerned with the problem have acted together on common problems through the South Pacific Commission and that since 1979 they have maintained the South Pacific Forum Fisheries Agency. One of the Forum Agency's major activities must be to build a common system consisting of knowledge, policy, negotiation, decision, and control to take advantage of the opportunity given by the meshing of extended fisheries jurisdictions. This opportunity is no more than the essential first step in a long, difficult, costly—and as I shall argue later, often unsuccessful—attempt to manage collectively fisheries that can in no way be managed individually.

Oman

The next country to receive our attention is the Sultanate of Oman. Forming the southeast tip of the Arabian Peninsula, Oman is a desert, mountain, and sea country, fronting on the Gulf of Oman and the Arabian Sea. Its population of 850,000 people comprising 300 tribes, occupies a land area of 120,000 square miles with a coastline of 800–1,000 miles. For 1979, FAO estimates its catch of fish at 197,984 metric tons and ranks Oman 46th in the world in that year. For reasons that will be discussed below, catch data are rudimentary to date and the annual catch has been estimated by FAO at 180,000 to 200,000 metric tons annually for the last decade. There is no reason to feel that these figures are overestimates, given the long coastline, the richness of the Arabian Sea, the extensive shelf and upwelling areas, the large number of artisanal fishermen, and the direct observations of widespread and abundant catches of numerous demersal and pelagic species. The country lacks a statistical system, but it does not lack fish.

We could well envy the simplicity and directness of decision-making in Oman, especially if we were in agreement with the decisions taken. Prior to the ascent of the present Sultan in 1970, Oman had essentially no national government. There were no ministries, no formal law, no administration, and no bureaucracy. Today all laws stem directly from the Sultan; there is no legislature, and decrees of the Sultan are not subject to a vote by the people. Ministers may make regulations which have the force of law.

Before the discovery of large oil resources and the increased oil prices brought the current prosperity to Oman, fishing had been an important source of food, employment, and income for Oman's coastal people. Fishing was carried out in the Arabian (Persian) Gulf, the Gulf of Oman, and

the Arabian Sea (northwest Indian Ocean). Exports of fish products from Oman enjoy good demand in the region.

All those who profess to know anything about the fisheries resources of the area believe them to be highly productive but very largely unused, particularly the pelagic stocks. (The late W. B. Chapman was so impressed by the potential for fisheries in the area and so insistent on their further exploration and development that in FAO's Department of Fisheries the area was known as the "Chapman Sea.")

Although the advent of oil diminished the relative importance of the fisheries sector and effort declined as fishermen took other jobs, the government of Oman looks ahead to the need for sources of income and employment other than oil. In 1972 the Sultan established a territorial sea of 12 miles, defined the continental shelf as the ocean floor to a distance of 200 miles or beyond to the depth of exploitability, and established a fishing zone of 50 nautical miles, including the territorial sea. In 1977 the Omani fishing zone was extended to measure 200 miles from the baseline from which the territorial sea is measured. The continental shelf connecting Oman and Iran is divided by agreement on a more-or-less median line.

A sultanic decree (1975) sets out the purposes of the Ministry of Agriculture, Fisheries, Petroleum, and Minerals—which preceded the present Ministry of Agriculture and Fisheries. I am indebted to J. Carl Mundt for the following paraphrase of Oman's fisheries objectives:¹⁵

- To achieve the highest and best use of fisheries
- To develop fisheries so that the economy of Oman increases and becomes free from dependence on petroleum
- To encourage local production
- To achieve economic self-sufficiency
- To conduct surveys of the fisheries resources of Oman
- To conduct development projects in fisheries
- To rely on economic and technical information and to follow up on such projects
- To encourage cooperatives in fisheries
- To manage and follow up the sultanate's interest in contracts with companies dealing with the development of fisheries resources
- To train the Omani staff that works at the Ministry

From this distance, it is fascinating and appealing to see the fisheries sector of Oman. Rich in resources, with clear, quick uninhibited systems of decision-making; with an oil resource to provide funds and to cushion the transition; without precedents, laws, voters, elections; without a congress or parliament or lobbyists or pressure groups—Oman sounds like a great place to take action and take it right. Of course it is not all that simple. The need for wisdom and good objectives is as great as anywhere else. Tribal precedents are as binding as law and may be harder to change.

However, there is no doubt that need, means, opportunity, resources, and action have converged for Omani fisheries at the same point in time.

Oman, emerging rapidly from the 12th to the 20th century and guided by a benevolent monarch, has found in the universal move to extend fisheries jurisdiction a means of safeguarding most of the resources off its shores. It has gained time. Unlike its wasting oil assets, its fisheries resources can be preserved and possibly increased. The extension of jurisdiction, toward which Oman moved promptly, creates a situation in which Oman can control events and build rational and profitable systems of exploitation and management. Whether it will succeed or not is entirely another matter. The world is full of bad examples to avoid and a few good ones to follow. All of us would welcome the chance to go back to square one. From my perspective, it looks as if this is where Oman is today.

Canada

Turning now to a developed country, a big gainer in the seaward extension of jurisdiction, Canada provides another example of the significance of the 200-mile zone to fisheries. Canada established a 12-mile territorial sea in 1970 and a 200-nautical-mile fishing zone on January 1, 1977. Within the 200-mile fishery zone, all the laws of Canada covering fishing within the territorial sea apply.

In fisheries production Canada ranked 15th in the world in 1979, with a catch of 1,331,898 metric tons, of which 1,282,398 MT were marine fish. Its production has been relatively consistent over the past decade. With about 12,800 miles (20,600 km) of coastline and 360,000 square miles (935,000 sq km) of continental shelf on three oceans, Canada is one of the world's most richly endowed maritime states.

On the Atlantic coast of Canada, groundfish are of major importance. Cod, redfish, pollock, haddock, and other species are pursued by 29,000 Canadian vessels, including approximately 300 stern and side trawlers. All Atlantic catches by Canadians are processed ashore in plants in 23 major and many smaller ports. In terms of value, Canada is the number one fish exporter in the world.

The importance of the role played by extension of jurisdiction in Canada's Atlantic fishery is described in the following quotation from FAO's Fishery Country Profile for Canada (1979):

The early seventies were characterized by consistently declining landings. This situation reached crisis proportions for the Canadian Atlantic groundfish industry in 1974, which at that time faced not only severely depleted fish stocks but the concurrent problems of a price decline for frozen products in the U.S. wholesale market and a sudden escalation of catching costs. A substantial infusion of special government assistance was required to prevent the collapse of major segments of the industry. This assistance, along with the declaration of a 200-mile fishing zone and strong growth in the market for Canadian fish abroad, have permitted a successful rehabilitation of the groundfishery. Growth in the pelagic and shellfish fisheries have also contributed to improving the industry's overall position.

The strict control and/or exclusion of foreign fishermen made it possible for Canada, with its strong and experienced institutions for fisheries re-

search and management, to begin the task of rebuilding the stocks of groundfish on its extensive Atlantic grounds. These have for centuries been heavily fished by fleets of many nations.

Several elements of the recent Canadian experience in managing its Atlantic fisheries are helpful in assessing the results that flow from the act of extending fisheries jurisdiction. For this brief assessment I am indebted to an unpublished manuscript by A.W. May, Assistant Deputy Minister, Atlantic Fisheries, Department of Fisheries and Oceans, Canada, entitled "The Management of Large Vessel Fishing Operations in the Canadian Atlantic Zone of the Extended Fisheries Jurisdiction" (April 1981).¹⁶

In his introduction May states:

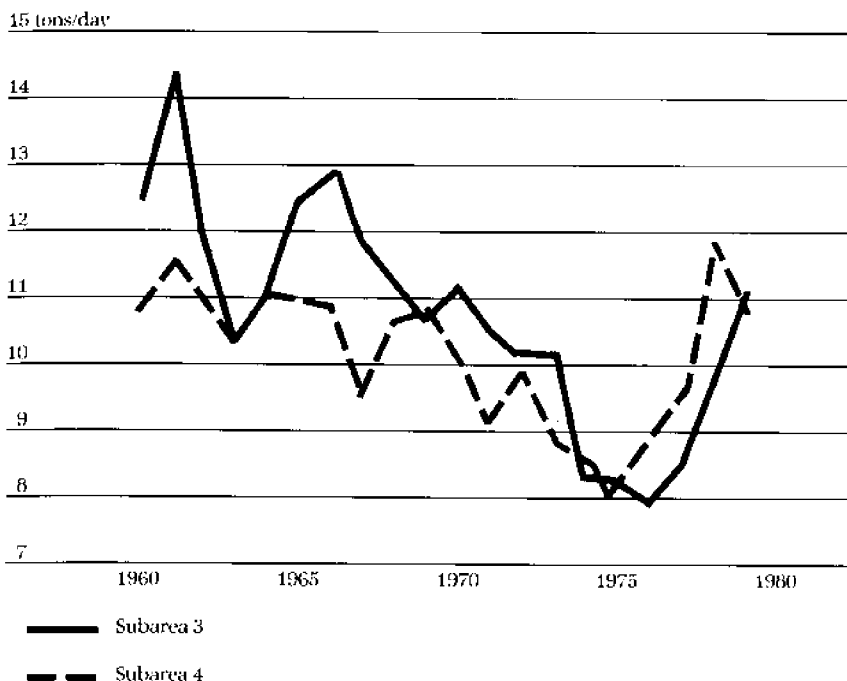
From 1950 to 1976 inclusive, fishing off the Atlantic Coast of Canada was managed by the International Commission for the Northwest Atlantic Fisheries (ICNAF). The initial management goal was to permit the maximum sustained catch by the application of open and closed seasons, closed areas, size limits for some species, limitations on fishing gear, and since the early 1970's, prescription of an overall catch limit for various species and stocks. The ICNAF convention was amended in 1969 (coming into force in Dec. 1971) to permit "appropriate proposals, for joint action by Contracting Governments, designed to achieve the optimum utilization of the stocks" which made possible the adoption of national catch quotas in 1972 and revision of the maximum sustained catch objective.

During the period of management by ICNAF, Canada observed a steady decline in abundance of groundfish stocks traditionally fished by her fishermen. Figure 1 illustrates the decline in catch rates by Canadian otter trawlers from 1960-1976. Declining catch rates meant increased costs of catching fish, which, in combination with a weakening of fish prices in the international market, led to a financial crisis in the Canadian Atlantic groundfish industry in 1974. This crisis underlined the urgency of instituting an effective marine fishery management regime. The early 1970's saw an evolution of international views that coastal state management was necessary for fish resources on the continental shelves. This consensus is expressed in the Informal Composite Negotiating Text developed by the United Nations Conference on the Law of the Sea (UNCLOS).

May's Figure 1, reproduced here, shows clearly that recovery in catch rates began in 1976 and must be presumed to be the result of conservation measures taken on the basis of earlier ICNAF recommendations. A point I shall be making in my conclusions is illustrated here for the years 1960-76. It is that, by and large, most multilateral international fisheries bodies have not yielded good conservation and management results—not because they cannot formulate good advice, but because member states, for many reasons, have been unwilling or have refused to accept such advice or to implement it.

Within its extended Atlantic jurisdiction, Canada has been ready and able to mount vigorous, production-oriented new programs of research, management, surveillance, and control. More than most countries, Canada has the resources, the trained men and women, the institutions, and the policy motivation to carry out such a program. Without the extended fish-

Figure 1
**Annual Average Catch Rates of Canadian Otter Trawlers
 of 150-999 tons in Northwest Atlantic Fisheries Organization
 Subareas 3 and 4*, 1960-1979**
 (adapted from May ¹⁶)



*Subareas 3 and 4 cover the main fishing grounds of the Maritime Provinces of Canada.

eries zone (EFZ), such programs would be futile. Without such programs, the EFZ would be meaningless.

In the Atlantic, Canada allows foreign vessels to take fish surplus to Canadian requirements and reserves. In addition Canada reserves, in some years, amounts of fish to be caught by foreign vessels for delivery to Canadian plants. This avoids the necessity of added overcapacity in the Canadian fleet by, in effect, using foreign vessels for "peaking" purposes.

Canadian control measures on foreign fishing include catch quotas, area restrictions, mesh size limits, total fishing days, beginning and ending dates, etc. These conditions are negotiated with each country involved. With regard to enforcement of Canadian rules, May states:¹⁷

Within the areas of extended jurisdiction, all foreign vessels are subject to Canadian regulations and any violators are tried in Canadian courts and are subject to fines and possible expulsion from the Canadian zone. Regulatory measures include:

(a) licensing by Canada of every foreign vessel active in fishing or support operations in Canadian waters, based on a fishing plan submitted in advance and the subsequent control of the number, type, time and location of these vessels;

(b) reporting by each foreign vessel where and when they intend to enter a Canadian area, their intended fishery, and where and when they intend to leave the Canadian area;

(c) weekly reporting of location, catches, and fishing effort of each foreign vessel while in the Canadian area;

(d) the right to direct a foreign vessel into a Canadian port for inspection or to rendezvous with a Canadian patrol vessel for inspection;

(e) the right to place a Canadian observer on board a foreign vessel at sea, or to have the observer picked up and returned to port;

(f) the requirement for foreign vessels to display specific markings for easier identification.

Canadian measures to deter violation of its regulations, whether by Canadian or foreign nationals, are said by May to be based on justifying the slogan "crime doesn't pay." Higher penalties are associated with lower need for detection of violations. Elements of the Atlantic surveillance system include aircraft patrols, sea patrols, and observers on fishing vessels reporting data into a computerized information system. Mathematical models are used to elaborate the deterrence concept and to plan the composition and strategic deployment of surveillance. Observers on foreign vessels are said to be an effective deterrent to violations of regulations and a valuable source of data on catches, in addition to being cost-effective. The cost of the observer program is recovered through license fees (it does not appear that the total cost of the surveillance and enforcement program is so recovered).

One can conclude from Canadian Atlantic experience to date: 1) multinational management had not produced satisfactory results, at least for Canada; 2) the establishment of an extended fisheries zone has created a setting in which Canadian research, management, conservation policies, and enforcement measures can be effective; 3) without such measures, carried out in a comprehensive, experienced, and costly way, controlling domestic as well as foreign fishing vessels, the EFZ would not be of much lasting value.

The Northeast Pacific

Among the areas examined to estimate the effects of extended fisheries jurisdiction, the last is the closest to home—that part of the Northeast Pacific Ocean off the shore of Alaska and the states of Washington, Oregon, and California. The Fishery Conservation and Management Act of 1976 (FCMA) became Public Law 94-265 of the United States on April 13, 1976. Its effective date was March 1, 1977. It has since been amended in various details without changing its basic structure or objectives and is now named the Magnuson Fishery Conservation and Management Act (MFCMA). In the Act's "findings" the Congress declares, *inter alia*:

... Many coastal areas are dependent upon fishing and related activities and their economies have been 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.

(7) A national program for the development of fisheries which are underutilized or not utilized by the United States fishing industry, 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.

The FCMA lists among its purposes:

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

Policy declarations in the FCMA relevant to the subject of these lectures include:

(1) to maintain without change the existing territorial¹⁶ or other ocean jurisdiction of the United States for all purposes other than the conservation and management of fishery resources as provided in this Act:

(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.

In Section 101, the FCMA establishes a Fishery Conservation Zone (FCZ), in the following words:

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 coterminus 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 of it is 200 nautical miles from the baseline from which the territorial sea is measured.

This description was later changed slightly to provide that the FCZ would be modified where necessary to accommodate international boundaries.

The Eastern Bering Sea-Aleutian Islands-Gulf of Alaska areas now under the exclusive jurisdiction of the United States are already one of the world's great fishing grounds. They have been fished heavily by man for several decades and far more heavily by great numbers of marine mam-

mals for unrecorded centuries. This is not the time or place to go deeply into the present or potential production of the Northeast Pacific fisheries. However a few comments and tables will illustrate what extended jurisdiction has meant and what it implies in this rich area. We will discuss the Eastern Bering Sea only, omitting much attention to the still-rich but lesser fishery resources of the Aleutian Islands and Gulf of Alaska.

The Eastern Bering Sea, with its extensive continental shelf and slope, has many species of commercially valuable fishes including five species of Pacific salmon; king, Tanner, Dungeness, and other crabs; herring, halibut, and widespread stocks of Alaska pollock; Pacific cod, rockfishes, sablefish, soles, flounders and other groundfishes; as well as quantities of squids and other pelagic forms. In addition, the area is frequented by great numbers of marine mammals of many species. Laevastu, Livingston, and Niggol (1980)¹⁹ list twenty-six species of marine mammals present in the Eastern Bering Sea during part or all of each year, including fourteen species of baleen, sperm, and toothed whales; three species of porpoises and dolphins; sea otters; and eight species of seals, sea lions, and walruses.

I have chosen to look at the effect of the extension of U.S. jurisdiction on the groundfish fisheries of the Eastern Bering Sea for several reasons: first, they were heavily fished by non-U.S. fleets; second, they were almost totally unfished by U.S. fishermen; third, they were singled out for special mention in the FCMA which established extended jurisdiction; fourth, other fisheries in the area are exploited and of greater immediate commercial significance; fifth, the absolute size of the groundfish resource is very large.

The record of total foreign catches of groundfish in the Eastern Bering Sea from 1954 to 1980, based on the best available data, is shown in Table 8. It is notable that in the years 1970-1976 catches ranged between a minimum of 1.5 million metric tons to a maximum of 2.2 million metric tons annually. The dominant species was pollock averaging 82.2 percent of the combined catch 1970-76, followed by yellowfin sole, 4.4 percent. Beginning in 1977, foreign catches have been under quotas recommended by the North Pacific Fisheries Management Council using procedures established under the FCMA.

For all practical purposes, the catch of groundfish by U.S. fishermen in the Eastern Bering Sea for many years and until recently was zero. There had been a U.S. fishery for cod for salting in the early years of the century, but it ceased years ago. The amounts of halibut taken by U.S. and Canadian fishermen in the Eastern Bering Sea were insignificant in comparison with the annual foreign catches of other species of groundfish averaging 1,865,335 MT, as shown for 1970-76 inclusive in Table 8. During the same years, the combined U.S.-Canadian halibut catch in the Bering Sea averaged 292 MT per year.²⁰

Why were U.S. fishermen not fishing for pollock, cod, and other groundfish species in the Eastern Bering Sea? The fish were there—their presence had been demonstrated for several decades by the operations of fleets of foreign trawlers, motherships, and factory trawlers. In fact, some of the frozen pollock blocks and fillets produced on those vessels have long been sold on U.S. markets (and continue to be sold). It was not lack of tech-

nology, know-how, familiarity with the area, or lack of capital. United States fishermen had access to all those ingredients. Construction and fuel costs and interest on borrowed money were factors then, but not to an unusual extent as they are today. Foreign competition on the fishing grounds was a factor, but the area is vast and the quantities of fish available are great and, with the exception of rockfish, have shown no alarming signs of depletion.

The basic reason for the failure of U.S. fishermen to utilize groundfish stocks in the Eastern Bering Sea, the Gulf of Alaska, and even to some extent off Washington and Oregon, is price—a price too low to cover their costs. The price for groundfish blocks and fillets is set in the U.S. markets to a great extent by foreign imports. As we all know, the U.S. is the world's greatest importer of fish. But the price is set not only by the price of imported blocks and fillets, it is fixed by the price of poultry, of pork, of beef, of other food products, and by the level of demand versus supply.

Quality is an important determinant of price. Foreign processing ships working at sea can have fish in their freezers within a few hours of capture. (Today, on the Soviet motherships freezing hake for the US-USSR joint venture operation off the coast of this state, any fish more than 4 hours out of the water is routed to the fish meal factory.) For U.S. fishermen and for processors and retailers, higher quality costs more, and the low value in the marketplace will not pay the costs.

What, then, has happened to the U.S. groundfish fishery in the Bering Sea and the Gulf since 1977, the year the EEZ took effect? The short answer might be "not much." But it is early times and there are some promising developments. Among them: foreign nations that meet the FCMA criteria are allocated rights to take fish that are surplus to predetermined requirements for U.S. fishermen, plus conservation and rebuilding needs. Thus resources for U.S. fishermen are assured up to the maximums the stock will support. Furthermore, U.S. fishermen are selling substantial and rapidly increasing quantities of U.S.-caught fish, on the fishing grounds, to foreign floating processors.

Preliminary requests for allocations for those joint venture fisheries for 1981 total 312,730 metric tons. Of this total, preliminary requests for hake off Washington and Oregon total 105,000 metric tons. Known requests for joint venture allocations in the Bering Sea, Aleutian Islands, Gulf of Alaska areas total 201,730 metric tons, of which 115,600 metric tons are for pollock, 36,250 are for Pacific cod, 36,900 metric tons are for yellowfin sole, and the remainder for a miscellany of other species. If all these requests are formally made, granted, and materialize as operations, there will be sea-going processors from the USSR, South Korea, Japan, Poland, the Federal Republic of Germany, Greece, and Bulgaria taking delivery at sea from U.S. fishing vessels.

One U.S. factory trawler has completed three cod fishing expeditions in the Bering Sea, returning from each trip of approximately 4 months with about one million pounds of frozen cod fillets of the highest quality. Four U.S. vessels equipped for trawling as well as king crabbing are now trawling for cod along the Aleutians, splitting and salting cod for sale to Norwe-

Table 8
Foreign catches in metric tons of groundfish
from eastern Bering Sea (east of 180°)
1954-1980

Year	Alaska Pollock	Pacific Cod	Rockfish	Sablefish	Yellowfin Sole	Rock Sole
1954	0	0	0	0	12,562	0
1955	0	0	0	0	14,690	0
1956	0	0	0	0	24,697	0
1957	0	0	0	0	24,145	0
1958	6,924	171	0	32	44,153	0
1959	32,793	2,864	0	393	185,321	0
1960	26,097	5,679	6,100	1,861	456,103	0
1961	24,216	2,448	47,000	26,183	553,742	0
1962	58,765	6,054	19,900	28,521	420,703	0
1963	103,353	3,879	24,500	18,404	85,810	5,002
1964	171,957	13,408	20,588	6,165	111,177	3,238
1965	229,275	14,722	17,723	5,001	53,810	3,678
1966	261,694	18,200	25,786	9,502	102,353	9,104
1967	550,152	31,982	20,598	11,567	162,228	4,762
1968	702,324	57,915	29,301	14,399	84,189	5,250
1969	869,096	50,487	16,150	16,033	167,134	9,240
1970	1,271,937	70,078	10,392	11,771	133,079	20,123
1971	1,757,541	43,041	10,369	15,134	160,399	40,419
1972	1,839,627	42,905	5,967	12,780	47,856	60,824
1973	1,754,294	53,386	3,622	5,961	78,240	23,835
1974	1,586,267	62,462	38,688	4,266	42,235	19,975
1975	1,285,083	51,551	20,181	2,814	65,775	11,145
1976	1,247,222	50,481	16,002	2,959	56,236	10,033
1977	879,061	33,320	8,339	2,863	58,473	5,290
1978	967,322	42,574	4,859	1,087	139,106	7,038
1979	913,881	32,981	6,353	1,276	99,017	5,010
1980	1,006,129	37,319	8,468	2,438	77,768	

Notes: 1980 figures include catches from Aleutian Island region.
 Provisional catches from a blend of estimates by U.S. observers and
 reported foreign catches.

Zeros indicate data not available

Source: National Marine Fisheries Service,
 Northwest and Alaska Fisheries Center, Seattle.

Flathead Sole	Alaska Plaice	Pacific Halibut	Arrowtooth Flounder	Greenland Turbot	Other	Total
0	0	0	0	0	0	12,562
0	0	0	0	0	0	14,690
0	0	0	0	0	0	24,697
0	0	0	0	0	0	24,145
0	0	196	0	0	147	51,623
0	0	674	0	0	380	222,425
0	0	6,931	36,843		10,260	549,874
0	0	3,480	57,348		554	714,971
0	0	7,865	58,226		5,931	605,965
29,625	975	7,452	31,565		1,102	311,667
25,286	1,838	1,271	33,729		736	389,395
6,713	979	1,369	9,747		2,218	345,235
11,020	4,633	2,199	13,042		2,239	459,772
23,437	3,853	3,756	23,869		4,378	840,582
21,575	2,619	2,775	35,232		22,058	977,637
18,563	6,942	2,764	36,029		10,459	1,202,897
41,152	3,402	1,735	12,598	19,691	15,295	1,611,253
51,024	992	4,861	18,792	40,464	33,496	2,176,532
15,690	290	1,445	13,124	64,510	110,893	2,215,931
18,141	1,117	940	9,217	55,280	55,826	2,059,859
14,917	2,388	204	21,473	69,654	60,261	1,922,790
5,545	2,614	274	20,832	64,819	54,845	1,585,475
8,264	3,665	146	17,851	60,969	26,143	1,499,971
7,588	3,119	2	11,507	30,287	35,902	1,075,751
14,618	9,474	4	10,151	42,261	61,537	1,270,031
6,507	15,569	0	7,921	34,998	49,514	1,173,027
	88,529				67,207	1,287,858

gian dryers. Two shore plants in Kodiak are trying to purchase groundfish (pollock) and process them for domestic or overseas markets. Several others have already tried and failed.

It is a fact that in Alaska, harbors, towns, support systems, and markets increase to the south and east, while fish stocks increase to the north and west. The fishing grounds of the Bering Sea lie closer to Kamchatka than they do to Seattle. It is also true that U.S. investors looking at these well-known resources with new interest because of the establishment of the U.S. fishery conservation zone are daunted by limited markets and rather low prices, combined with high construction costs, high interest rates, high labor costs, and high and rising fuel costs. Other nations with lower costs and vessels long amortized and without alternatives have a distinct advantage. A line drawn on the ocean does not guarantee a profitable operation. However, these are early times—fishermen, processors, investors, and state and federal legislative bodies are all engaged in continuing efforts to find a favorable answer to a cost-benefit calculation. The resources are large, perhaps much larger than the conservation-oriented levels of maximum sustainable yield set by the North Pacific Fisheries Management Council and the Secretary of Commerce would indicate. Laevastu, Livingston, and Niggol²¹ state:

The total consumption of finfish by marine mammals in the Eastern Bering Sea and the Aleutian region is about 3 million tonnes [sic] annually, of which about two-thirds are commercial species. The total consumption of fish by marine mammals is about twice the present catch by domestic and foreign fisheries.

Other evidence also can be adduced to indicate that the Bering Sea fishery resources are much greater than the present level of catch and present estimates of maximum sustainable yield (MSY) indicate. While seasonality and weather are factors, it is *not* lack of fish that inhibits development of a U.S. groundfish fishery.

Of course there are problems other than the cost-price squeeze already mentioned. These include: lack of processing capability afloat or ashore near the fishing grounds, lack of harbors, supply and repair facilities, cold storages, docks or much of anything else near the fishing grounds. (However, these factors have not prevented the establishment of the salmon, crab and other high-value, short season fisheries.) Because groundfish fishing is a long-season, high-volume, low-price operation and because a trawl is more or less omnivorous, there are problems with incidental catches of other species already heavily fished or overfished and certainly overcapitalized. Those already making a difficult living fishing salmon, halibut, crab, and even herring have either already begun attempts to constrain domestic as well as foreign trawlers by area, time, gear type, etc. or predictably will do so in the future. The Regional Councils established under the FCMA already face the difficult task of deciding to what extent some species should be prohibited to trawls or allocated in controlled numbers as incidental catches. The problems are aggravated because many of the high-value fisheries already endure an excess of entrants and constantly shortening seasons.

For these and other reasons, the establishment of extended fisheries jurisdiction by the United States has not yet meant a dramatic turnaround in developing groundfish fisheries that were available earlier and are still fenced off by other barricades old and new, but primarily of an economic nature.

Reflections

When I was asked to give these lectures in honor of Don McKernan, there was some discussion of the subject matter. Professor Miles suggested that I should draw from my lifelong involvement with international fisheries activities and offer some "reflections" on world fisheries. What follows are reflections, based on what I have seen in this period of transition, as we move rapidly from narrow national limits and open fishing to a new condition marked by almost universal extension of national jurisdiction.

Why did it happen? Why did we move so rapidly from narrow limits to 200 miles—limits so broad that 99 percent of the world's marine catch now comes from within one or another national jurisdiction—an area more or less equal to the land surface of the earth now under a substantial degree of national sovereignty? It seems to me that extended jurisdiction came about for two complementary reasons: first, the rapid expansion of distant-water fishing using vessels, technology, manpower, and gear that hopelessly outclass the fishermen of most coastal states; second, the failure of most regional international management bodies which, even when they existed, almost without exception have presided over overexploited and declining fisheries because of:

- lack of authority;
- lack of resources;
- lack of integrated and independent research resulting in poor data bases;
- time-consuming processes of study and recommendation inadequate to the pace at which problems developed;
- awkward and slow processes for turning conservation recommendations into action decisions;
- the absolute difficulty of the problems encountered, which perhaps defy solutions at this time;
- the basic difficulties in the process of international negotiation and agreement, which tend to produce the lowest common denominator of action.

Extension of jurisdiction has not lessened significantly the need for regional international arrangements. It seems to me that this point is vividly illustrated in the brief description I gave of the highly migratory tuna stocks moving continually in complex patterns through the jurisdictions of the

many island states in the South Pacific galaxy. While this is an extreme example of the problem of shared stocks, similar problems exist wherever stocks of fish move from one national jurisdiction to another. We have only to look at the failure of the U.S. and Canada to solve the salmon interception problem in more than 10 years of trying, to see how difficult the question of managing shared stocks can be. In such circumstances, extension of jurisdiction contributes little to the solution of the problem. It does, of course, (at least theoretically) bring fishermen from other jurisdictions under control. The tragedy of the commons has been simplified and in some cases eliminated. In other cases, principal roles in the game have been passed to new players from neighboring countries. But the problems of research, of data collection, of rational management decisions, of timeliness, of monitoring, surveillance, enforcement, allocations, and of basic economic and sociological aspects remain. Lack of jurisdiction is now not an excuse for failure to solve them.

Following this line of thought, extension of jurisdiction does not *in itself* make life easier for the developing countries, who for the most part have extended their jurisdiction over fisheries. Their progress and development continue to be impeded by poverty, political instability, lack of trained people, lack of institutions, inefficiency and worse, all of which continue to plague their fisheries development. (As an aside, I estimate that there are more professionals engaged in fisheries teaching, research, and management in this small corner of North America than there are in all of Africa.)

This leads me to a further reflection, which is that the game may not be worth the candle in all cases. The costs of an efficient research and data-collection program, plus the establishment of a fisheries administration—including the monitoring, surveillance and control systems needed—may far exceed the net profits available from the fishery, whether it is utilized by national fishermen or rented to others. Last year, when I traveled to Palau, a small emerging island nation in the Marianas, to assist in their annual negotiation with foreign fishermen for tuna fishing rights in their EEZ, the best we could achieve was an annual payment of slightly more than \$400,000. While I have no reason to believe that this was an unreasonably small fee, the fact remains that it would pay only a small part of the costs of monitoring, surveillance, and control that would be necessary if the fishery were to be kept in rational limits. Under such circumstances, one can only hope that the enlightened self-interest of those wishing to fish the stocks on a continuing basis will lead them to do self-policing on a user basis. Nothing makes me think it will happen that way.

This leads to a further thought—that fisheries for many countries is a small matter. It seems unlikely that fisheries alone will be able to pay the heavy costs of research, management, surveillance, and enforcement, particularly in countries faced both with poverty and many more pressing problems closer at hand. Perhaps for such reasons, many nations find it the best solution to rent to others the use of their fishing grounds until such time as their own nationals can take over. This would be an explanation for the increasing size, as recently as 1980, of the distant-water fleets of several nations. The fact remains that good management of an exclusive fishing

zone may entail more costs than its owner or its users or its resources can support. The costs and benefits of extended jurisdiction are not distributed in equal proportions and not on the basis of national ability to pay or to implement.

There is in my mind a persistent and nagging thought that a single-species approach to fisheries research and regulation may be far too simplistic for the realities of interaction and interdependence in the marine biosphere. Jacob Needleman said it well in the periodical *Science* 81:²²

Suddenly the ecological crisis was telling us that everywhere in nature, beneath appearances, there exists an integrity far more powerful than any law that modern science had yet envisioned.

To take a simple example close to home, the great marine mammal populations of the Eastern Bering Sea cannot long be ignored, allowing us to treat the fisheries as if mammals and their interactions with the fish stocks were not an important factor in direct competition with human fishermen for several species.

In further reflection, seaward extensions of national jurisdiction have given us a new situation, somewhat simpler, at least in theory. If other things were equal, there would be a winner (the national owner) for every loser (the fleet from another country, whether near or far). But, the movements of fish being as they are, everything is not that equal. Multinational conservation systems have been weak, slow, and tardy in nearly all cases. The early successes of the simple two-nation International Pacific Halibut Commission and International Pacific Salmon Fisheries Commission by and large have not been repeated elsewhere. The increased relative cost of energy, high interest rates, and high construction costs have had, and will continue to have, devastating effects on many newly established as well as old fisheries. Most distant-water fisheries might have eventually succumbed to such economic realities with or without extension of jurisdiction.

We must also keep always in mind that the regimes of men and the regimes of fishes are not yet the same. In many places, single stocks of fish move through many political and industrial regimes, often not particularly well coordinated, always competitive.

Looking more broadly at where we are today, in my judgment the Law of the Sea Conference represents a brave, imaginative attempt to codify laws governing the 70 percent of the earth's surface that is covered by the sea. Perhaps it was fear that their coastal fisheries would be swallowed up by a massive new international bureaucracy and authority that led practically all of the world's nations to claim authority to 200 miles. But, having asserted their authority, many states are no better prepared to implement it than they are to deal with all of their land-based problems. Or even less so. Costs and benefits have not been distributed proportionately or rationally. However, the experiment has only just begun, and since mankind has lived under a 3-mile limit for the last 400 years, the whole of our modern era, it is far too soon to say where this transition will take us.

To return to my title, extended fisheries jurisdiction is more than a palliative but less than a panacea. It is a new beginning and a correct one. It has removed one unknown from the complex and difficult equation of fisheries development, which remains to be solved.

No one would have been a keener observer or a more vigorous participant in this process than Don McKernan.

Endnotes

1. The eleven developing countries are: Peru, China, Chile, South Korea, Thailand, India, Indonesia, North Korea, Philippines, Mexico, and Vietnam.
2. Numbers of vessels given in this paragraph are from *Lloyds' Register of Shipping*, Statistical Tables (London: Wyman and Sons, 1980).
3. This total is for fishing vessels only—i.e., excluding carriers and floating factories.
4. From *Yearbook of Fishery Statistics* (Rome: Food and Agriculture Organization, United Nations, 1979), Table A-5.
5. Catch data from Table 2. Vessel data from *Lloyds' Register of Shipping* (London: Wyman and Sons, 1979).
6. The dependent territories of New Zealand (3 at 12 miles) and of the United Kingdom (11 at 3 miles) are omitted. Source: Gerald Moore, *Legislation on Coastal State Requirements for Foreign Fishing* (Rome: Food and Agriculture Organization, United Nations, Legislative Study No. 21, 1981).
7. United Nations, 28 April 1979, A/Conf. 62/W.P. 10/Rev. 1.
8. K.S. Lucas, Text of address to the International Seafood Conference, Rome, 12 November 1980.
9. FAO divides major fishing areas into numbered sectors for statistical purposes.
10. *Fishery Country Profile, Mauritania* (Rome: Food and Agriculture Organization, United Nations, June 1980), F10CP/Mau. Rev. 3.
11. R.E. Kearney, *Some Problems of Developing and Managing Fisheries in Small Island States* (South Pacific Commission, October 1979), Occasional Paper No. 16.
12. Edward L. Miles, *The Management of Tuna Fisheries in the West Central and Southwest Pacific* (Rome: Food and Agriculture Organization, United Nations. Prepared for Expert Consultation on Monitoring, Control, and Surveillance Systems for the Management of Fisheries, 27-30 April 1981).
13. Ibid.
14. Ibid.
15. J. Carl Mundt, *Legal and Institutional Aspects of Fisheries Management in Oman* (Rome: Food and Agriculture Organization, United Nations, 1980).
16. A.W. May, "The Management of Large Vessel Fishing Operations in the Canadian Atlantic Zone of the Extended Fisheries Jurisdiction" (Unpublished manuscript, April 1981).
17. Ibid.
18. Author's note: 3 miles since 1793.
19. T. Laevastu, P. Livingston, and K. Niggol, *Marine Mammals in Fisheries Ecosystem in the Eastern Bering Sea and in the Northeastern Pacific Ocean. Part 2. Consumption of Fish and Other Marine Biota by Mammals in the Eastern Bering Sea and Aleutian Region* (Seattle: National Marine Fisheries Service, Northwest and Alaska Fisheries Center, April 1980), Processed Report No. 80-10, p. 1.
20. Data from International Pacific Halibut Commission Annual Reports, 1970-1976.
21. Laevastu et al., 1980, p. 1.
22. Jacob Needleman, "An Awkward Question," *Science* 81, June 1981, pp. 58-59.

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A native of Alaska, Jackson received a bachelor's degree in fisheries from the University of Washington in 1939 and a bachelor's degree in civil engineering from the University of British Columbia in 1948. He joined the International Pacific Salmon Fisheries Commission in 1943 and served in various engineering and biological capacities, as well as its Assistant Director. In 1955 he left to become Director of the International North Pacific Fisheries Commission, a post he held until 1964, when he left to join FAO as Assistant Director General (Fisheries). He is presently a partner in Natural Resources Consultants of Seattle.

