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COMMITTEE ON THE PEACEFUL USES OF THE SEABED AND THE OCEAN FLOOR BEYOND THE LIMITS OF NATIONAL JURISDICTION

SUBCOMMITTEE II

Statement on Fisheries by Donald L. McKernan
Alternate United States Representative

August 17, 1971

Mr. Chairman:

I wish to express on behalf of my Delegation, my pleasure in participating in this Subcommittee under your Chairmanship. Please be assured of our cooperation in the work of the Subcommittee.

During the past several days a number of Delegations have spoken on the subject of fisheries. These interventions have been enlightening in that they reveal the importance which many countries attribute to this subject and they demonstrate the wide range of views of the Subcommittee. In order for the 1973 Conference on Law of the Sea to be brought to a successful conclusion, this Subcommittee must consider the range of views expressed and formulate a fisheries regime which will insure conservation of the living resources of the sea and provide for greater equity in the opportunity for coastal States to harvest fish and shellfish from the oceans.

Mr. Chairman, we have prepared a background paper on the nutritional importance of fish, their behavorial characteristics and distribution patterns and trends in fish production. This paper will be circulated among the members of the Committee. This

document may be helpful in formulating views concerning resolution of fisheries problems. The background paper is provided to supplement the excellent data and maps prepared by the FAO, included in the report circulated at this meeting (A/AC.138/47).

The world's catch of marine fish has increased rapidly since the end of World War II. Although during the period shortly following the War, increases in fish catches reflected rapid rebuilding and expansion of the traditional fisheries in the Northern Hemisphere, in more recent years the growth has largely reflected increased catches from marine areas off Southeast Asia, South America and Africa. The catch of marine fish in 1948 was reported at about 15 million tons and increased to 57 million tons in 1968. In the last few years, however, catches have levelled off and a report by FAO on fisheries resources (FAO Fish Technological Paper No. 97) implies the rate of growth in world fisheries will probably decline over this decade.

It would appear that the world fish catch is levelling off not only because there are fewer places in the ocean where living resources are not heavily fished but also because conservation practices have lagged behind technological advances and rapid increases in fishing effort. It is our view that the world fish catch can be increased but to do so we must adopt better conservation methods and consider the possibility of reducing fishing effort on heavily fished resources of the world oceans. It is apparent from the FAO document which forecasted potential fishing production by region, that greater catches can come from those parts of the oceans lying off the coast of many developing countries. But if they are to achieve the full potential available in these areas it will be necessary to increase our knowledge of these latent resources and develop new fishing technology.

Many nations have stated that there must be changes in the rules governing high sea fisheries and that many developing and some developed countries have expressed the view that the present practices strongly favor the distant water fisheries of highly developed nations. We agree that there is a conflict between the right to fish freely on the high seas on one hand and the right to participate and to ensure protection of coastal stocks of fish on the other hand.

We regret, Mr. Chairman, that the debate thus far in this Subcommittee would suggest a polarization of views between those urging exclusive coastal State rights in a specified zone of the oceans beyond the territorial sea and those favoring minimal preferences for coastal States and no exercise of coastal State jurisdiction beyond the territorial seas. In introducing our

draft fisheries Articles last week, our Representative stated that one of the principle purposes of the United States' Delegation in making concrete proposals was to promote serious discussions between States holding the widely divergent points of view expressed in this Subcommittee. We had hoped that some of the principles reflected in these Articles might provide a means of resolving the fisheries problem and would do so in a manner that would not interfere with freedom of navigation.

On the one hand, our concrete proposals are designed to take into account coastal States' interests in increasing their participation in the exploitation of the fisheries adjacent to their coasts. They provide for coastal State preferential rights based on fishing capacity; the preference would expand along with an increase in the coastal States' capacity to fish. Moreover, we have recognized the right of the coastal State, in the absence of agreement on an international or regional organization, to apply and enforce this preference unilaterally in accordance with specified procedures and standards. On the other hand, the exclusive jurisdiction of the coastal State is precluded beyond its territorial sea. We have emphasized the role of regional and international organizations, including provisions designed to promote their use; we have made coastal State jurisdiction subject to compulsory third party dispute settlement and specified international standards to which the coastal State must conform in exercising its delegated jurisdiction, and have included express provisions for the protection of other uses of the oceans. Moreover, we have provided special treatment for migratory ocean species and salmon and other species which spawn in fresh waters and migrate to sea.

Finally, we have indicated that the question of the extent to which a history of traditional fishing in coastal waters by foreign fishermen should limit the extent of the coastal States' implementation of its preference, a matter which goes to the very heart of the accommodation of coastal and distant water interests, is a most appropriate subject for meaningful negotiations between the coastal and distant water fishing States participating in this Subcommittee's work.

Other matters which it would be appropriate for this Subcommittee to discuss in connection with different fisheries proposals would be international arrangements for registration of vessels and the maintenance of records concerning the quantity of fish taken and the effort required for their harvest as well as the possible establishment of a worldwide commission under FAO to assist developing countries in developing their expertise to deal with conservation and develop the resources in their adjacent coastal waters.

In summary, Mr. Chairman, my Delegation welcomes the extended discussion of fisheries issues which has already taken place in this Subcommittee and expresses the hope that the various Delegations will

consider carefully the various factual information that has been made available to this Subcommittee and discuss with their respective governments ways and means of accommodating the different points of view expressed. It is our view that this Subcommittee's fisheries negotiations should facilitate and not impede an overall Law of the Sea agreement which is both equitable and generally acceptable.

Thank you, Mr. Chairman.

Background Paper on Fisheries
Prepared by the United States Delegation
to the Committee on the Peaceful Uses of the Sea-Bed and the
Ocean Floor Beyond the Limits of National Jurisdiction

SUBCOMMITTEE II

August 17, 1971

The importance of fish in human nutrition is frequently underestimated When fisheries products are considered relative to total world protein sources, they contribute only three percent of that consumed by man. However, if fish are evaluated vis-a-vis other animal protein supplies, all of which have important nutritional constituents absent in commonly eaten plant proteins, they rank third in importance behind milk and meat. The importance of fish is even more dramatically shown when one considers its contribution to the diet of the world population. Borgstrom 1/, for example, notes that, although milk provides 3.5x as much animal protein to human nutrition as fish, and meat provides 2.0x as much as fish, fish is essential to more people than either meat or milk. Fish is the primary source of animal protein to nations with low nutritional levels; that is it fills the gap between starvation and subsistence for far more millions than does either milk or meat. More than two-thirds of all meat and milk is consumed by less than 600 million people but over 1.5 billion humans depend on aquatic foods for more than one-half of their average daily animal protein. Examples of this dependence by nations are given in Table 1.

3.5 times
2.0 times

There are several thousands of species of marine fish and shellfish which are important in the commercial catches of the world. Scientists frequently group them, on the basis of distribution and behavioral features, into three major categories: benthic, demersal and pelagic. Benthic species are those that live on or in the seabed sediments. Those of commercial importance to man include a variety of clams and oysters and crabs. Most are harvested in relatively shallow waters (less than 100 meters), although some commercially important crabs are harvested at depths up to at least 1,000 meters. The demersal fish and shellfish are those which generally live on or near the oceans seabed (e.g. cods, flounders and some shrimps). Their distribution ranges from relatively shallow tidal waters to the great depths of the ocean seabed. The pelagic species are those which generally inhabit ocean space above the ocean seabed and are generally free swimming in the water column (e.g. herrings, tunas, mackeral, anchovies, squids, etc.). It should be understood, however, that demersal and benthic species are not necessarily confined to the continental shelf and slope areas of the world nor are the pelagic species restricted to the open ocean.

Species of fish and shell fish may be further categorized, into coastal, oceanic and anadromous species. The coastal species, which may be benthic, demersal or pelagic, are those that generally inhabit the waters closely adjacent to the major land masses or islands of the world. For the most part they are confined to the shallow seas and those important to man seldom inhabit depths greater than 1200 meters. Oceanic species are those that inhabit the vast open spaces of the major oceans of the world and that

Table I (from Borgstrom)

Fish in Protein Balance of Selected Countries (Average for 1957-1959)

Country	Fish protein (grams per day per capita)	Animal protein (grams per day per capita)	Fish protein (%)
Austria	1.6	42.2	4.0
Belgium	3.5	44.0	8.0
Eire	2.1	51.4	4.0
France	2.8	45.9	6.1
Greece	3.7	21.0	17.6
Italy	2.8	25.9	10.6
Netherlands	2.3	45.1	5.1
Portugal	13.6	23.2	58.4
Spain	4.7	20.0	23.5
United Kingdom	4.4	49.0	9.0
West Germany	3.7	43.5	8.5
Denmark	7.1	53.1	10.7
Finland	5.8	68.4	7.2
Norway	9.5	50.4	18.9
Sweden	8.3	57.0	14.6
Soviet Union	3.3	33.0	10.0
Canada	3.6	62.9	5.1
United States	2.5	66.0	3.8
Mexico	0.7	17.5	4.0
Costa Rica	0.7	21.2	3.3
Cuba	0.7	28.7	2.4
Dominican Republic	1.9	12.7	11.0
Haiti	0.7	5.0	14.0
Honduras	0.7	8.9	7.9
Argentina	1.0	56.6	2.0
Brazil	1.1	24.3	4.5
Chile	6.5	26.9	18.2
Colombia	0.7	20.2	3.5
Ecuador	1.4	10.9	12.8
Peru	2.8	13.2	21.2
Venezuela	6.7	24.2	27.6
Burma	7.6	13.0	58.5
Ceylon	2.77	6.2	51.0
China[a]	3.0	10.0	30.0
India	1.7	6.6	25.7
Indonesia	2.4	4.8	50.0
Japan	11.1	17.4	63.8
Pakistan	2.2	5.7	38.6
Philippines	6.4	11.4	56.1
Taiwan	7.5	12.8	58.6
Thailand	7.1	29.5	24.0

[a]Estimate

normally have cosmopolitan distributions; that is, their ranges extend across the oceans and the same species are frequently found in all oceans of the world. As with coastal species, most forms harvested by man inhabit the shallow photic zone (area of light penetration) and are seldom taken at depths greater than 500 meters. The anadromous species are those which spawn in the fresh waters of the rivers and lakes of major land masses and whose young migrate into the open ocean areas to feed and mature (salmon, smelts, etc.). They are important in world fisheries particularly in the temperate and subarctic areas of the Northern Hemisphere.

The expansion of high seas fisheries accelerated during the period following World War II. During this period introduction of new electronics which aided navigation, acoustical devices which assisted fish detection, and synthetic fibers which greatly improved net durability and strength contributed to the growth of world fisheries. From 1948 to 1968 world fish catches increased in an almost logarithmic manner from 15 to 57 million tons. The growth rate of fisheries, which has been about seven percent per annum, has greatly outpaced the rate of growth in human population. Most of the increases in catches in the years shortly following World War II occurred as the result of activities in the Northern Hemisphere where the traditional fishing nations of the world rebuilt their fleets and dispatched them to historic fishing grounds. However, in the period 1956-1970, a growing demand for fish by developed countries, coupled with interest on the part of developing countries in producing fish from coastal waters -- stimulated growth of fisheries in the South Atlantic and Pacific. As a result, the landings from the Southern Hemisphere grew rapidly. In the last half of the past decade (1965-69), Asian and South American countries accounted for almost two-thirds of the total increases in world fish landings while production by African countries, along with the USSR, accounted for most of the remaining increase (Table 2).

Even with highly advanced technology, most of the world fish catch is still taken from the waters closely adjacent to land masses, that is, over the continental shelf and slope areas. The waters, which represent about 14 percent of the ocean surface area, contribute somewhat more than 90 percent of the world production of fish. By contrast the great open areas of the world oceans contribute less than 10 percent of the total. This, however, should not be considered as indicative of the potential of the respective areas. The evolution of fisheries in the coastal areas reflects logistic advantages of exploiting coastal areas and the fact that natural environmental factors tend to aggregate fish in coastal areas making them more susceptible to harvest. By contrast, the oceanic forms are often more widely dispersed throughout ocean space and their extraction more difficult.

Two important environmental features play a role in determining the availability and abundance of fish resources adjacent to coastal States. They include the extent of continental shelf and upper slope, to 1200 meters, and the rate of nutrient renewal from deeper water (phosphates, nitrates, etc.). The former provides the habitat required for a great variety of demersal fish and invertebrates and the latter the enrichment process required to maintain a high level of basic productivity -- important to both pelagic and demersal forms. As these two environmental factors vary throughout the world's oceans, so does the abundance of fish. Those coastal states having large continental shelves will generally be blessed with productive fishing zones. Similarly,

Table 2 Trends in Total Production by Regional Fishing Fleets and by FAO Marine Areas (000's m.t.)

Table 1a.	1965	1969	Difference (m.t.)	Trend (%)
Region				
Africa	3,310	4,570	+1,260	+38
N & C America	4,480	4,560	+ 80	+ 2
South America	9,020	11,310	+2,290	+25
Asia	20,710	24,730	+4,020	+19
Europe	10,870	11,210	+ 340	+ 3
Oceania	180	200	+ 20	+11
USSR	5,100	6,500	+1,400	+27
TOTAL	53,770	63,080	+9,410	+17

Table 1b.				
Marine Areas				
NW Atlantic	4,000	4,500	+ 500	+12
NE Atlantic	9,600	9,900	+ 300	+ 3
W Cen Atlantic	1,300	1,300	--	0
E Cen Atlantic	1,200	2,000	+ 800	+67
SW Atlantic	500	700	+ 200	+40
SE Atlantic	2,100	3,400	+1,300	+62
Mediterranean	1,000	1,000	--	0
Indian Ocean	1,900	2,700	+ 800	+42
N. Pacific	6,600	8,000	+1,400	+21
W Cen. Pacific	9,700	12,000	+2,300	+24
E Cen. Pacific	600	700	+ 100	+17
SW Pacific	200	300	+ 100	+50
SE Pacific	8,100	9,200	+1,100	+14
TOTAL 1/	46,800	55,700	+8,300	+19

1/ Difference in totals is due to freshwater catches which are included in upper table but not in the lower.

those coastal states that have upwelling zones adjacent to their coast should also be blessed with rich offshore fisheries resources. It is for these reasons that the continental shelf areas of the North Atlantic, the Bering Sea, the East China Sea, waters adjacent to Indonesia, the Patogonian Shelf, etc. represent important fishing grounds or potential fishing grounds. Similarly, upwelling areas off Peru, West Africa and in certain portions of the Indian Ocean, etc. are important or potentially important zones for fish production. Many coastal countries, however, have neither extensive shelf areas nor upwelling zones off their coast. And hence the abundance of fish in these waters will not be extensive.

We have noted that the existing world production is in the order of 60 million metric tons. In a recent study of the fisheries resources of the ocean (FAO Fisheries Technical Paper No. 97) the potential for world production of fish of the types traditionally taken by man is estimated to be in the order of 100 million metric tons. Hence, there are opportunities for further increases in world fish catches. Indeed, if technological advances allow for harvesting smaller fish and large animal plankton not now of economic importance, the production possibilities would be substantially larger. In a regional sense (see Table 3), the opportunities for expanding world fisheries are for the most part in the Southern Hemisphere, in the Indian Ocean, and in the Malaysia-Indonesia area.

These potentials are based on the assumption that all stocks would be exploited at their optimum level. Indeed this is one of the challenging aspects of this particular conference. That is, can we adopt managerial systems for the living resources of the sea which will tend to optimize the available biological potential? Quoting from the Fisheries Resources of the Ocean (FAO Fisheries Technical Paper No. 97)" even with a good system of management in operation, it is very doubtful if a pattern of fishing could be maintained to exploit all stocks at the proper level. Inevitably some, probably the more valuable, will be to some extent over-exploited, and others -- the less valuable, or more dispersed -- will be under-exploited."

It is obvious that the behavior patterns of some species of fish, that is, their mobility and general migratory characteristics, make it difficult to establish effective management systems conceived in light of artificial boundaries.

For many coastal species there are characteristic migration patterns -- the species may move inshore and offshore, that is, to greater depths during one season and to shallower waters in another. Vertical movements may be compounded by geographic migrations that parallel coastlines. For example, in the Northern Hemisphere many coastal species migrate onshore to the shallower water during the spring and summer. At the same time there may be a geographic migration of the adult stocks to the north in the spring and summer and in a southerly direction in the fall and winter. The extent of vertical and geographic movements vary between species and area. Migrations of coastal species seem to be greater in the temperate and polar regions than in the tropical zones. For most coastal species geographic and depth migrations are not extensive (generally less than 1000 kilometers and 500 meters, respectively). By contrast, oceanic species such as tunas and billfish may make transoceanic migrations.

Table 3

Table [illegible] – Potential yields of various groups of marine animals and recent catches (million tons)

	Northern Temperate					Southern Temperate				Tropical						Antarctic	TOTAL	Catch		
	Atlantic		Pacific		Mediter-ranean	Atlantic		Pacific		Atlantic		Indian		Pacific						
	NW	NE	NW	NE		SW	SE	SW	SE	WC	EC	W	E	WC	EC			1966	1967	1968
A. Large Pelagic																				
Salmon	ø	ø	0.3	0.3																
Large Tuna, Billfishes										0.2		0.1		0.4			0.6	0.6	0.6	0.5
Skipjack, Bonito, etc.					Incl.in tropical areas					0.9		0.6		1.5			0.7	0.7	0.7	0.8
TOTAL	ø	ø	0.3	0.3													3.0	0.7	0.7	0.7
B. Demersal										1.1		0.7		1.9			4.3	2.0	2.0	2.0
Flounders	0.4	0.8	0.1	0.5	ø	ø	ø										1.8	1.1	1.2	1.2
Cod, Haddock, etc.	1.8	2.9	0.1	0.1													4.9	4.2	4.3	5.0
Hakes	0.6	0.1	–	0.2	ø	1.5	0.6		0.2		ø				0.2		3.4	1.2	1.6	1.3
Small Gadoids	–	1.4	1.5	0.5		1.0	–										4.4	1.8	2.4	3.1
Rock Fishes	0.3	0.3	ø	0.3			ø										1.0	0.8	0.7	0.6
Croakers, Snappers, etc.	ø	0.1	ø	–			0.2	ø	ø	0.2	0.2	4.4	3.0	11.0	0.1		27.0	10.4	10.8	11.2
Other Demersal	0.5	0.9		0.2	0.4	1.3	0.3	0.2	0.4	1.8	0.7				1.1					
Shark, Rays	ø	0.1		ø																
TOTAL	3.6	6.6	1.7	1.8	0.4	3.8	1.1	0.2	0.6	2.0	0.9	4.4	3.0	11.0	1.4		42.5	19.5	21.0	22.4
C. Shoaling Pelagic																				
Anchovies		0.3	0.6	–	0.5	1.0	0.7	0.1	11.0	0.5	0.7	2.0	0.7	1.0	2.5		21.6	10.6	11.7	12.4
Herrings, Sardines	0.7	4.0	0.4	1.0	0.2	1.5	1.4	0.2	0.4	2.0	0.8	1.0	0.5	1.5	0.5		16.1	6.8	6.8	6.8
Mackerel, Jack Mackerel	0.1	1.1	1.4	0.1	0.1	0.5	1.0	0.1	0.2	–	0.4	1.0	0.8	1.5	0.6		8.9	3.2	3.8	4.1
Saury	ø	–	0.5	0.4					0.3						0.1		1.3	0.3	0.3	0.2
Capelin	1.0	0.8	–	0.5		–	–										2.3	0.5	0.5	0.6
Sand-eels	1.0	0.5	0.3	0.5		–	0.1										2.4	0.3	0.3	0.4
Various others						0.5	–			0.5							1.0	1.7	1.7	1.9
TOTAL	2.8	6.7	3.2	2.5	0.8	3.5	3.2	0.4	11.9	3.0	1.9	4.0	2.0	4.0	3.7		53.6	23.4	25.1	26.4
D. Crustaceans																				
Lobsters, Rock Lobsters	ø	0.1	ø		ø	ø	ø	ø	ø	ø	ø	ø	ø	ø	ø		0.2	0.1	0.1	0.1
Shrimps, Prawns	ø	0.1	0.1		ø	0.1	ø	ø	ø	0.2	0.1	0.1	0.1	0.5	0.1		1.4	0.8	0.8	0.8
Crabs	ø	ø	0.3		ø	ø	ø	ø	0.1	0.1	ø	ø	ø	0.2	ø		0.7	0.3	0.3	0.4
Various marine crustns.																		0.1	0.1	0.1
TOTAL	0.1	0.2.	0.4		ø	0.1	ø	ø	0.1	0.3	0.1	0.1	0.1	0.7	0.1		2.3	1.3	1.3	1.4
E. Molluscs																				
Oysters	Production largely dependent on cultivation																	0.8	0.8	0.8
Mussels	Total potential may be many times that of naturally occurring stocks																	0.3	0.3	0.3
Various others																		1.0	1.0	1.1
TOTAL(ex.cephalopods)																				
F. Cephalopods																		2.1	2.1	2.2
G. Lanternfish etc.																	10–100	0.8	0.9	1.2
H. Euphausids																	100+			ø
TOTAL A + B + C	6.4	13.3	5.2	4.6	1.2	7.3	4.3	0.6	12.5	5.5	3.4	8.8	5.3	16.0	6.0	50+	?			
Catch (including crustaceans and molluscs)																	100.4	–	–	–
1966	4.0	10.2	13.2		1.0	0.6	2.2	0.4	10.1	1.3	1.3	1.3	0.8	3.2	0.6			50.2		
1967	4.0	10.2	13.8		1.0	1.3	2.6	0.4	11.2	1.3	1.4	1.2	0.9	3.4	0.7				53.4	
1968	4.7	10.3	14.5		1.1	0.8	3.3	0.4	11.9	1.4	1.5	1.2	1.0	3.8	0.7					56.6

Notes – ø denotes catches less than 100 tons
– information zero

Such migrations of oceanic and coastal species are further complicated by the fact that there are certain movements associated with the age of individual fish. For example, for coastal species, these migrations generally result in a movement to deeper waters with increased age of the fish. Similar age-specific migrations and distribution patterns are also known to prevail for oceanic forms. We do not mean to imply that the mobility of fish makes managerial system impractical. It only requires an understanding of the characteristics of such migrations and the nature of exploitation through the distributional range of a particular stock.

Implementation of effective concsrvation measures for living resources of the ocean is frequently confused by semantic problems. The term "over-fishing" is frequently used in a variety of ways. In one sense, over-fishing implies that the size of stock has been reduced to a level where it is no longer economically feasible for the fishermen to engage in fishing (economic over-fishing). Over-fishing used in this sense does not imply any biological damage to the reproductive status of the stock or misuse of the resource that is available. It reflects an economic condition whereby man, with present technology, is no longer able to extract the resource, i.e., cost of harvest exceeds value of raw material.

Over-fishing may also be used to imply a situation where harvesters of a resource misuse the potential that is available. That is, every stock has a theoretical surplus production which can be harvested by man. This surplus production, however, will be maximized only if the strategy of fishing is designed in a manner so as to allow the stock to maximize its growth potential. This can be analogized with picking of fruit from an orchard. If the fruit is picked too early, it will not mature and achieve its weight potential. On the other hand, if picking starts too late, much of the fruit will have fallen from the tree. Hence, the rate of fishing on the stock must be considered in light of the growth rate and natural mortality of the population, and of the size spectrum of fish being harvested.

Finally, over-fishing may reflect a situation where the biological productivity of the stock has been impaired. This means that the number of young entering the fishery have been reduced as a result of over-fishing of the parental stock.

There are obviously a variety of management systems that can be evolved to effectively cope with the conservation aspects of living resources of the sea. What is important in terms of the resources is that the institutional arrangements function in a timely fashion and that the consequences of such actions are properly interpreted in light of the life history and dynamics of the resources being harvested. Whatever systems are adopted must recognize the need for timely action in order that the resources are not over-fished with subsequent decrease of food prodcution and economic losses to thcs e who harvest the resources.