

THE LAW OF THE SEA: ANADROMOUS AND CATADROMOUS FISH STOCKS, SEDENTARY SPECIES, AND THE HIGHLY MIGRATORY SPECIES

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I. INTRODUCTION

The fishing industry has been important to many nations of the world since mankind first sailed the ocean. The diets and economies of many nations are still inextricably linked to the sea. Prior to 1900, the international fishing fleets were guided only by the principle of "catch-as-catch-can." Demand seemed relatively light when contrasted with the seemingly endless supply, and fishing had

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little effect on the international stock of fish. In addition, the gain to be realized by restricting access and extending jurisdictional claims over the ocean was slight in comparison to the costs of enforcing an exclusive access system.¹ The development of new technology since 1900, however, has rendered ocean surveillance cost efficient,² and larger populations and increased technical capabilities have caused a dramatic increase in the world demand for fish products resulting in tremendous pressure on the fisheries of the oceans. "It has been estimated that the worldwide harvest of these resources has increased fifteenfold"³ since the beginning of the twentieth century.

The world commercial catch of fish and other aquatic organisms has steadily increased in recent years and in 1981 amounted to 74,760,000 metric tons.⁴ In 1976, it was estimated that six countries accounted for fifty percent of the world catch of fish—Japan (14.8 percent), the U.S.S.R. (14.1 percent), China (6.4 percent), Peru (6.0 percent), Norway (4.7 percent), and the United States (4.1 percent).⁵ The commercial fishing industry of the United States increased its catch each year after 1977, and in 1981, the United States had gone from the sixth to the fourth largest fish producing nation in the world.⁶ Catches of the U.S. commercial fishing industry totaled 6.4 billion pounds valued at \$2.4 billion in 1982, representing an increase of seven percent in quantity over 1981.⁷ The economic value of the marine recreational fishing industry is also significant.⁸ The total value of edible and nonedible fishery products imported by the United States is estimated at \$4.5 billion, and this amount far exceeds the \$1.1 billion value of U.S. domestic exports of these same products.⁹

1. Prewo, *Ocean Fishing: Economic Efficiency and the Law of the Sea*, 15 TEX. INT'L L.J. 261, 262 (1980) [hereinafter cited as Prewo].

2. *Id.*

3. Taft, *The Third U.N. Law of the Sea Conference: Major Unresolved Fisheries Issues*, 14 COLUM. J. TRANSNAT'L L. 112, 112 (1975) [hereinafter cited as Taft].

4. This figure does not include marine mammals and aquatic plants. NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEPT. COMMERCE, FISHERIES OF THE UNITED STATES, 1982 26 (1983) [hereinafter cited as FISHERIES 1982].

5. NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEPT. COMMERCE, FISHERY STATISTICS OF THE UNITED STATES 1976 40 (1980) [hereinafter cited as FISHERY STATISTICS 1976].

6. FISHERIES 1982, *supra* note 4, at 26.

7. *Id.* at iv.

8. See Warner, *Conservation Aspects of the Fishery Conservation and Management Act and the Protection of Critical Marine Habitat*, 23 NAT. RESOURCES J. 97, 97 (1983) [hereinafter cited as Warner]; NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEPT. COMMERCE, MARINE RECREATIONAL FISHERY STATISTICS SURVEY, ATLANTIC AND GULF COASTS, 1979 (1980).

9. FISHERIES 1982, *supra* note 4, at v.

This increased demand upon ocean resources intensifies the need for regulation. Different catch limits for different species of fish are now recognized as necessary to rational fisheries management. Achieving the goal of effective management has proved difficult for two reasons. First, most overexploited stocks inhabit international waters where national regulation is ineffective. Second, no international authority exists to legislate and enforce rules to preserve fishery resources.¹⁰

II. ANADROMOUS AND CATADROMOUS FISH STOCKS, SEDFENTARY SPECIES, AND HIGHLY MIGRATORY SPECIES

A. DELIMITATION OF PROBLEMS

One very basic impediment to rational fisheries management was the traditional and widespread belief that the high seas were common areas and that ocean resources were common property. While the term "common property" was frequently utilized, it was used de facto to mean *res nullius* (i.e., the property of nobody), and the general laymen's use of "common property" should not be confused with the concept of the "common heritage of mankind" based on *res communes* (i.e., things common to all). Historically, farmers grazed their livestock on communal fields and common pastures, particularly in common law countries. The frequent result was overgrazing.¹¹ Given a limited resource and no system of allocation but "first-come-first-served," the ultimate result was destruction of the resource and the industries dependent on it. Under such a system, it can be postulated that each seafaring nation will seek to harvest all the fish it can, knowing that another country will do so if it does not. No country will attempt to conserve fish stocks because what it can preserve, another will take. This problem has been called the "tragedy of the commons."¹² When applied to the fisheries scenario, the result has been overfishing and depleted stocks.¹³ As human populations increased, most common law countries abandoned the "commons" concept with regard to food gathering, pasturing, and hunting and fishing areas; however, the com-

10. Copes, *The Law of the Sea and Management of Anadromous Fish Stocks*, 4 OCEAN DEV. & INT'L L.J. 233, 233-34 (1977) [hereinafter cited as Copes].

11. *Id.* at 248-49.

12. See Alverson, *Management of the Ocean's Living Resources: An Essay Review*, 3 OCEAN DEV. & INT'L L.J. 99, 111 (1975) [hereinafter cited as Alverson]; Hardin, *The Tragedy of the Commons*, in ENVTL. HANDBOOK (G. DeBell ed. 1970) [hereinafter cited as Hardin].

13. Alverson, *supra* note 12, at 111.

munal approach has not been fully abandoned internationally.¹⁴

Fisheries management presents certain problems not evident in other conservation activities. First, fish cannot easily be confined to particular areas. They move—often between areas of national control and the high seas (anadromous and catadromous species) or between widely separated areas of the high seas (highly migratory species). Second, fish are both a perishable and a replenishable resource. Since fisheries are such an important food source, they cannot and should not be absolutely protected, but they should not be depleted beyond their capacity to replenish themselves. Determining the optimum annual harvest of any species, however, presents extraordinary technical difficulties.¹⁵

The difficulties of fisheries management are illustrated by Canada's efforts to conserve its stocks of Pacific and Atlantic salmon. Salmon is an anadromous species, that is, one which: (1) spawns in fresh waters; (2) spends most of its life cycle in the ocean where the fish mature; and (3) returns to the rivers and streams of its origin to renew the cycle.¹⁶ Protection and enhancement of salmon stocks during the freshwater phase of the life cycle are extremely important to achieve maximum returns from the salmon resource. The country of origin must ensure that pollution in salmon rivers is held to a minimum. Obstructions to the salmon run, such as landslides, dams, and other obstacles, must either be removed or overcome. Habitat improvement, as well as the operation of spawning channels and hatcheries, may add greatly to the build-up of salmon stocks. Of course, these improvements require substantial government expenditures.

It has also been demonstrated that salmon eggs can be introduced into a lake to which salmon are not indigenous, that the eggs will hatch, and that the salmon will return to that lake to spawn. This ability to move salmon to new areas is heartening to environmentalists, but it should not be considered to be a panacea for manmade water projects which interfere with the indigenous salmon run. Salmon must be protected in their natural habitats.

Inevitably, the use of a river for salmon production competes with other uses, such as, power generation, flood control, industrial

14. Hardin, *supra* note 12, at 48.

15. Kronfol, *The Exclusive Economic Zone: A Critique of Contemporary Law of the Sea*, 9 J. MAR. L. & COM. 461, 465-66 (1978) [hereinafter cited as Kronfol].

16. Taft, *supra* note 3, at 114-15.

waste disposal, irrigation, and navigation. An economically rational choice between competing uses will be made by a country only if it incurs the full cost and benefit of the choice.¹⁷ Even so, a large proportion of salmon originating in Canadian and U.S. rivers is caught by nations which did not contribute to the Canadian or U.S. salmon program.

The Third United Nations Conference on the Law of the Sea (UNCLOS III) attempted to solve some of these problems. For example, the Convention on the Law of the Sea (LOS Convention)¹⁸ negotiated at UNCLOS III, creates an exclusive economic zone (EEZ),¹⁹ in which coastal states are entitled to exercise "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources,"²⁰ including the fish stocks. Under this "functional jurisdiction," first proposed by Canada and the United States, the coastal state may not exercise authority over maritime activities concerned with the internationally lawful uses of the sea which are related to navigation and communication²¹ in the expanse of water outside its own narrow territorial sea.

The proposed regime, as promulgated in the early negotiations in 1976, specifically allowed coastal states to implement rational fishery management plans for all fish stocks specific to their economic zones.

Coastal states' rights and responsibilities include the right to determine the allowable catch of the living resources in the zone for the purpose of achieving the "maximum sustainable yield" of the fisheries population [Article 61]. The coastal state is also given the right to determine the objective of the "optimum utilization of the living resources in the exclusive economic zone." Where the coastal state does not have the capacity to harvest the entire allowable catch, it must through agreements and other arrangement and pursuant to a wide variety of factors, give other states access to the surplus of the allowable catch [Article 62].²²

17. See Copes, *supra* note 10, at 242, 244.

18. Done Dec. 10, 1982, reprinted in 21 I.L.M. 1261, U.N. Doc. A/CONF.62/122 (1982) [hereinafter cited as LOS Convention].

19. *Id.* arts. 55-75. As the rights of the coastal state in its economic zone are not exclusive, the exclusive economic zone is more properly referred to as just the "economic zone."

20. *Id.* art. 56, para. 1(a).

21. *Id.* art. 58, para. 1; see Copes, *supra* note 10, at 235.

22. Kronfol, *supra* note 15, at 464; see LOS Convention, *supra* note 18, arts. 61-62.

Although the concept of "maximum sustainable yield"²³ (MSY) has been modified somewhat, these rights and responsibilities are preserved in the LOS Convention. As most fish are caught within 200 miles of land, adoption of the EEZ concept has caused and will continue to cause political and economic problems for the distant-water fishing nations.

Some of these problems have already occurred in the United States. Concern with the depletion of fish stocks near U.S. shores led Congress to enact the Fishery Conservation and Management Act of 1976 (FCMA or MFCMA)²⁴ creating a 200-mile exclusive fisheries zone around American coasts. Between the enactment of FCMA and March 1977, Russian trawlers were cited for fifty-three violations, and the situation became even more serious in April 1977, when the Coast Guard seized a Russian trawler.²⁵ Although the crisis was resolved peacefully in this case, the potential for a dangerous showdown is clear.

The LOS Convention does not provide a satisfactory solution to the problem. Faced with the argument that stronger language would abridge the sovereign rights of coastal states over fish in their EEZ's, the negotiators settled on an article which calls merely for cooperation among involved countries to provide for adequate management.²⁶ The article is merely hortatory, and neither sanctions nor enforcement procedures are provided to deter uncooperative countries.²⁷

The chance of establishing bilateral agreements between countries interested in fishery resources within a given EEZ may be quite high. The United States has successfully utilized this bilateral agreement approach and should continue to do so in the future. With regard to those areas of the high seas and to those species that do not remain within the EEZ, however, there may be several interested countries, and agreement becomes more difficult.²⁸ Problems with initial catch quotas and future adjustments to quotas may prove to be insurmountable, and differing opinions concerning optimal management guidelines or acceptable fishing methods may

23. For a good discussion of "maximum sustainable yield," see H. KNIGHT, *THE LAW OF THE SEA: CASES, DOCUMENTS, AND READINGS* 659-62 (1976) [hereinafter cited as LOS CASES].

24. 16 U.S.C. § 1801-1882 (1976 & Supp. V 1981).

25. See *A Little Stink About a Lot of Fish*, TIME, Apr. 25, 1977, at 46.

26. See LOS Convention, *supra* note 18, art. 63.

27. See Copes, *supra* note 10, at 235.

28. *Id.* at 236.

be difficult to reconcile. Even if countries can surmount the initial stages of a particular fishery negotiation, the agreement could founder under pressures from outside countries not party to the agreement. These countries may make unacceptable quota demands or simply ignore the regulations. Countries which were originally adherents to the fisheries regime may then feel entitled or compelled to increase their catch to make up for the fish taken by interlopers.²⁹

The North American salmon situation provides an illustration. Canadian and U.S. investment averaged \$8.99 million between the years 1969 and 1974.³⁰ The gross value of Canada's east coast salmon catch, however, averaged only \$2.75 million over the same period.³¹ The salmon stocks off Greenland, where salmon regularly migrate to feed, increased benefiting from American and Canadian management.³² While the United States and Canada suffered a loss on their investments, Greenland fishermen realized a profit.³³ The inevitable result of such an inequitable arrangement will probably be the discontinuation of conservation efforts.

The LOS Convention formally acknowledges the primary right of the country of origin to its anadromous and coastal stocks.³⁴ The logic of placing the management and harvest of anadromous stocks under the regulation of the coastal states where such stocks originate is implicitly recognized by all the nations which participated in UNCLOS III. Even so, there are several "escape clauses" incorporated into the LOS Convention which allow for the circumvention of this principle. For example, high seas fishing for anadromous species is permitted if the "non-states of origin" can show that they would suffer "economic dislocation" without such fishing.³⁵ Even such developed nations as Japan could make such a claim. About fifty percent of Japan's annual catch of eleven million tons is taken from foreign seas.³⁶ After the United States and the U.S.S.R. implemented their 200-mile fishery zones, the \$7.2 billion Japanese fishing industry had approximately 5,500 fishing and pro-

29. *Id.* at 235-36.

30. *Id.* at 240.

31. *Id.*

32. *Id.*

33. *Id.*

34. LOS Convention, *supra* note 18, art. 66.

35. *Id.*

36. JAPAN: *Pinched Between 200-Mile Limits*, U.S. NEWS & WORLD REP., Feb. 28, 1977, at 70.

cessing boats idled, and Japanese cannery traffic slowed significantly.³⁷

The LOS Convention requires the respective countries of origin to cooperate in mitigating this economic impact, but non-states of origin have no reciprocal obligation to minimize losses to states of origin in their management of stocks.³⁸ The country of origin is required to set up conservation programs to govern the use of its coastal and anadromous stocks, yet non-states are not obligated to follow the maximum-catch rule.³⁹ Therefore, due to noncompliance by non-states of origin, the only way for the state of origin to stabilize the catch at the maximum sustainable yield is to limit the catch of its own nationals.⁴⁰ The result is a constructive subsidy for foreign fleets.

In 1970, a "Declaration of Principles" by the U.N. General Assembly stated that the seabed beyond the limits of national jurisdiction, together with its resources, constituted the "common heritage of mankind."⁴¹ The EEZ concept, however, does little to promote equitable distribution of the resources of the "common heritage." Under this concept, the developed nations have received a disproportionately large share of ocean fisheries, and thus have derived the greatest benefit from such a regime. For example, seven nations (the United States, Australia, Canada, Japan, Norway, Portugal, and the U.S.S.R.) control twenty-four percent of the area included within economic zones.⁴²

The rights of the landlocked and geographically disadvantaged states (LL/GDS) must also be considered. Under existing international law, the LL/GDS may fish in the high seas, but the transformation of these fishing grounds into exclusive zones has seriously hurt, if not totally eliminated, the fishing conducted by the LL/GDS.⁴³

The LOS Convention provides for sharing of fishery resources

37. *Fishing to get around the 200-mi. limit*, BUS. WEEK, May 9, 1977, at 36.

38. LOS Convention, *supra* note 18, art. 66, para. 3(b); Copes, *supra* note 10, at 246.

39. See Copes, *supra* note 10, at 246.

40. *Id.* at 246.

41. Declaration of Principles on the Seabed Beyond the Limits of National Jurisdiction, G.A. Res. 2749, 25 U.N. GAOR Supp. (No. 28) at 24, U.N. Doc. A/8028 (1970); see Note, *A "Common Heritage" Approach to Fisheries Through Regional Controls*, 10 N.Y.U. J. INT'L L. & POL. 171, 171 (1977) [hereinafter cited as *Regional Approach*].

42. *Regional Approach*, *supra* note 41, at 183.

43. See Jayakumar, *The Issue of the Rights of Landlocked and Geographically Disadvantaged States in the Living Resources of the Economic Zone*, 18 VA. J. INT'L L. 69, 72 (1977).

with the landlocked states,⁴⁴ but the duty could be unduly burdensome for the parties to a sharing agreement. For example, Tanzania, a coastal state, has five landlocked neighbors, while Uganda, a landlocked state, is surrounded by four coastal states.⁴⁵ Sharing of resources with geographically disadvantaged states is also provided. Zaire, with a surface area of nearly one million square miles but with a minimal shoreline, is accorded a zone of only twelve nautical miles.⁴⁶

From a global perspective, the EEZ concept is not the answer to rational fishery management:

The spatial concept of jurisdiction, that is, selecting a given area over which control is to be exercised, does not take into account the distribution and structure of the fisheries resource, and is therefore unlikely to bring the entire resource under the control of a single state or entity. Conservation measures enacted with respect to that portion of the fishery stock within any individual state's exclusive area necessarily will be piecemeal vis-a-vis the entire resource. The irrationality of attempting to manage an area in which the fish may be found, rather than managing the fish themselves, has already been recognized in various provisions of current statutes and pending treaties concerning highly migratory species.⁴⁷

An example of the global nature of fisheries problems is the possible economic impact of climatic change on world fisheries. Human activity, in particular the effects of carbon dioxide accumulation due to the combustion of carbon-based fuels, could cause higher air temperatures, disturb the strength and direction of ocean currents, and increase the average salinity and temperature of surface sea water.⁴⁸ Fluctuations in these variables may affect, inter alia, "spawning, migration, growth rates, food supplies, and predator-prey relationships."⁴⁹

There are numerous instances which demonstrate the sensitivity of marine fisheries to climatic change. The most dramatic is probably the collapse of the Peruvian anchovy industry during 1972

44. LOS Convention, *supra* note 18, art. 69.

45. *Regional Approach*, *supra* note 41, at 184.

46. *Id.*

47. *Id.* at 191.

48. Frye, *Climatic Change and Fisheries Management*, 23 NAT. RESOURCES J. 77, 77, 85 (1983).

49. *Id.* at 88.

(from a catch of twelve million metric tons to two million tons) following the appearance of a warm current called "El Niño" which dipped farther south than usual into Peruvian waters.⁵⁰ While the degree to which El Niño affected the anchovies may have been great, it was still speculative. El Niño merely added the "last straw" to an "environmental threshold" that was already waiting to collapse due to previous overexploitation of the anchovies and poor fisheries management by Peru. This situation also illustrates that even when there is good fisheries management, a fisheries catch level based on the principle of "maximum sustainable yield" may not be enough. To allow for unexpected environmental changes such as El Niño, an "environmental cushion" needs to be added to the fish stocks maintained under the concept of maximum sustainable yield.

Another dramatic example of the sensitivity of fisheries to climatic change occurred during a warming trend between 1900 and 1940, when yields in the cod fishery of West Greenland increased from zero to 70,000 tons.⁵¹ The cod fishery collapsed due to an overall cooling trend after 1940, which modified climatic patterns, including currents, winds, and temperature.

Due to slow mixing which occurs between the surface and intermediate ocean waters, the full climatic effects resulting from any given concentration of carbon dioxide might not be evident for years.⁵² Such a lengthy lag time makes climatic change essentially irreversible, and this situation suggests that a remedial policy may have to be formulated, implemented, and maintained for decades without the benefit of supporting data or feedback.⁵³ Fisheries problems of such great magnitude can only be adequately managed by international agreement.

B. GOALS

A single international fishery objective is difficult to formulate because fishing nations are economically, technologically, biologically, socially, and politically diverse. For example, large fishing companies dispatch modern fleets to distant-water fishing grounds to compete with fishermen in many countries who use

50. *Id.* at 89.

51. *Id.*

52. *Id.* at 95.

53. *Id.*

fishing techniques similar to those used hundreds of years ago.⁵⁴ Despite the vast differences among nations, it has been generally stated that:

The main purpose of international fisheries law is to facilitate international fisheries practice with a minimum of international friction. This does not mean that there be no disputes, but rather that disputes be solved quickly and effectively. The major impediment to solution of international fishing disputes is the injection of notions of sovereignty, national prestige, and ideology into what is by nature an economic and pragmatic concern. Issues of military security, naval manoeuvres, overflight, and a host of nonfishery concerns complicate the solution of international fishery problems, especially those that are a manifestation of coastal state/distant water fishing state conflict.⁵⁵

The American Society of International Law (ASIL) has delineated eight principles which should form the basis of an optimum global fisheries management policy. These principles state that: (1) there should be an objective of establishing jurisdictional bases for fisheries management entities; (2) the management entity should have the exclusive right to dispose of resources; (3) a global fisheries monitoring agency should be established; (4) management entities should be granted flexibility in management where systems are not inconsistent with global standards; (5) the goal of the management regime would be the maximization of opportunities for that country; (6) there should be provisions for dispute settlement and avoidance; (7) actions inconsistent with any global fisheries treaty should be curtailed; and (8) enforcement authority should be given to the entity having jurisdiction.⁵⁶ Many of these goals influenced the provisions in the LOS Convention, and the LOS Convention can be interpreted not only to support these goals, but also to provide opportunities for giving effect to these principles—within the general international framework delimited in the LOS Convention.

U.S. ocean policy has several goals: security; management (avoidance, reduction, and settlement) of conflict; promotion of ef-

54. THE LAW OF THE SEAS: NEEDS AND INTERESTS OF DEVELOPING COUNTRIES 95 (L. Alexander ed. 1972) (Proceedings of the Seventh Annual Conference of the Law of the Sea Institute, University of Rhode Island, Kingston, Rhode Island, June 26-29, 1972).

55. Ottenheimer, *Patterns of Development in International Fishery Law*, 1973 CANADIAN Y.B. INT'L L. 37, 38.

56. AM. SOC'Y INT'L L., Principles for a Global Fisheries Management Regime 1-20 (1974).

iciency and fair access in ocean use; protection of the environment; and promotion of ocean research. In addition, there is an overall goal of "maintaining a favorable legal order."⁵⁷ These goals overlap and interface with the eight principles enumerated by the ASIL. It has already been noted that equitable allocation of fishery resources contributes to the goal of conflict management. Fairness and equity in the allocation of resources may also include promoting full utilization of resources to meet world needs, ensuring fair access to common resources, and stabilizing expectations with regard to exclusive resources. Protection of the environment obviously includes conservation of living resources.

These goals are best achieved within the context of a legal order where: (1) coastal states exercise control over coastal fish stocks subject to effective conservation and environmental safeguards and subject to the requirements of full utilization; (2) the state of origin exercises the primary responsibility for management of its anadromous stocks subject to conditions ensuring effective conservation and full utilization; (3) highly migratory stocks (e.g., tuna) are managed on a regional basis with assurances of fair access; (4) cetaceans (e.g. whales and dolphins) are managed on a global basis by an International Cetacean Commission (a successor organization to the International Whaling Commission) to ensure conservation both within and beyond the limits of national jurisdiction; and (5) sedentary species are managed by coastal states with the jurisdictional limit being the 200-mile limit of the EEZ or the edge of the continental margin whichever is farther seaward.⁵⁸

The LOS Convention provides for management of anadromous species by the country of origin in article 66 which provides "States in whose rivers anadromous stocks originate shall have the primary interest in and responsibility for such stocks."⁵⁹ The FCMA claims jurisdiction over those species of fish which "spawn" in the fresh waters or in the estuarine waters of the United States and which migrate thence to the ocean. The FCMA seems to assert the same control over these species as is provided for in article 66, since in all likelihood the term "spawn" is synonymous with the term

57. See Moore, *A Foreign Policy For The Oceans*, in *THE OCEANS AND U.S. FOREIGN POLICY* 1, 2-4 (Center for Oceans Law & Policy, Apr. 1978).

58. *Id.* at 4. The edge of the continental margin should be delimited pursuant to a Hedberg-type formula. See Hedberg, *A Critique of Boundary Provisions in the Law of the Sea Treaty*, 12 *OCEAN DEV. & INT'L L.J.* 337 (1983).

59. LOS Convention, *supra* note 18, art 66, para. 1.

“originate.”⁶⁰ Nonetheless, “[i]f ‘originate’ means that jurisdiction over salmon is conferred upon the state from whose waters the fish enter the ocean rather than upon the state in whose waters they spawn, then the United States is exercising less authority in some instances than the . . . treaty provides.”⁶¹ It has been suggested that because of the economic investment required of coastal states to preserve anadromous species at harvestable levels, the catching of these species on the high seas should be banned and that the harvest be limited to territorial waters during the return of these fish to their spawning grounds.⁶² This approach, however, is politically unacceptable, at least without a form of economic “payoff” for nonaccess.⁶³ Although coastal state regulation is the only effective means of protecting the inland spawning grounds of anadromous species, an international treaty is needed to halt the depletion of salmon that has resulted from the utilization of drift-netting techniques.

The LOS Convention does not go far enough in promoting these goals. With regard to the management of highly migratory stocks, it does not require coastal states which have these stocks within their 200-mile zones to join regional organizations, and therefore, coastal states may try to impose onerous restrictions on the taking of highly migratory species. Indeed, the prevailing view is that despite article 64 of the LOS Convention, these species are treated no differently than other living resources within the coastal zone.⁶⁴ Article 64 of the LOS Convention, which governs highly migratory species, should require membership in regional organizations for these coastal states.⁶⁵

Possibly the most commercially important highly migratory species is tuna, which is exempt from the fishery management authority of the United States under the FCMA.⁶⁶ Under the majority view of the LOS Convention, the United States would be authorized to manage tuna within its 200-mile zone, but the United States may refuse to exercise this authority and continue to follow

60. See Burke, *U.S. Fishery Management And The New Law Of The Sea*, 76 AM. J. INT'L L. 24, 45 (1982) [hereinafter cited as Burke].

61. *Id.*

62. LOS CASES, *supra* note 23, at 676.

63. *Id.*

64. Burke, *supra* note 60, at 41.

65. LOS Convention, *supra* note 18, art. 64.

66. See 16 U.S.C. §§ 1813 & 1802(14) (1976 & Supp. V 1981).

a policy of regulating tuna fishing by international agreement.⁶⁷ The purpose in not asserting jurisdiction over tuna within U.S. coastal waters is to allow continued access of U.S. distant-water tuna vessels to the coastal waters of other nations which might otherwise assert jurisdiction over tuna within their 200-mile zones.⁶⁸ Nonetheless, other countries have rejected U.S. claims that tuna are not subject to coastal state regulation. Throughout the era of UNCLOS III, the United States was one of a minority of countries which did not claim jurisdiction over tuna.⁶⁹ As a result, the bluefin tuna was heavily fished along the U.S. coast, and its numbers were seriously depleted.⁷⁰ In the future, the need to protect this species from over-fishing might preclude the United States from maintaining its policy of excluding tuna from its jurisdiction.⁷¹

This minority policy promulgated by the United States has provoked controversies with Canada, Mexico, and other nations relating to access to tuna.⁷² These controversies peaked in 1979, when Canada, Mexico, Costa Rica, and Peru seized United States tuna boats fishing within their 200-mile zones.⁷³ The United States retaliated by placing embargoes on Costa Rican, Peruvian, and Canadian tuna and related tuna products.⁷⁴ Although much of the controversy surrounding U.S. fishing rights to tuna and other species has been resolved,⁷⁵ these conflicts demonstrated the need to replace the discredited Inter-American Tropical Tuna Commission.⁷⁶

There is growing support for regulation of wide ranging species, such as, tuna and whales, on an international basis since these species have only minimal contact with the 200-mile zones of coastal states.⁷⁷ Accordingly, article 64 of the LOS Convention

67. Burke, *supra* note 60, at 43.

68. *Id.*

69. *Atlantic Bluefin Tuna Stocks: Hearing Before the National Ocean Policy Study of the Senate Comm. on Commerce, Science, and Transportation, 97th Cong., 1st Sess. 2* (1982).

70. *Id.* at 1.

71. *Id.*

72. See Note, *The Tuna War: Fishery Jurisdiction In International Law*, 1981 U. ILL. L. REV. 755, 764-65, 767-68.

73. Note, *Recent Developments In The Law Of The Sea 1978-1979*, 17 SAN DIEGO L. REV. 691, 719 (1980) [hereinafter cited as *LOS 1978-1979*].

74. *Id.* at 720.

75. *Id.* See generally Rhee, *The Application of Equitable Principles to Resolve the United States-Canada Dispute Over East Coast Fishery Resources*, 21 HARV. INT'L L.J. 667 (1980); Donaldson & Pontecorvo, *Economic Rationalization of Fisheries: The Problem of Conflicting National Interests on Georges Bank*, 8 OCEAN DEV. & INT'L L.J. 149 (1980).

76. *LOS 1978-1979, supra* note 73, at 720.

77. *LOS CASES, supra* note 23, at 676.

should have provided that nonmembers of the International Whaling Commission (IWC) or its successor organization must adopt conservation measures in their economic zones which are "no less effective than international standards."⁷⁸ It was unfortunate that this suggestion was not incorporated into article 64.

Sedentary species are generally defined as "organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the sea-bed or the subsoil."⁷⁹ Most disputes concerning sedentary species involve various species of lobster and whether these are included within this definition.⁸⁰ Article 77 of the LOS Convention grants coastal states the right to exploit natural resources including sedentary species contained within the continental shelf,⁸¹ yet article 68 specifically exempts sedentary species from the EEZ restrictions imposed in part V.⁸² Since the LOS Convention imposes no obligations regarding yields or surplus, the FCMA recognizes greater foreign rights to these living resources than is required under the LOS Convention, and this results from subjecting sedentary species to the same FCMA management requirements as any other species.⁸³

The ultimate goal of conservation is the maximization of food production of the oceans. The LOS Convention calls for production up to the "maximum sustainable yield."⁸⁴ The calculation of maximum sustainable yield, however, is a complicated exercise requiring a large amount of information about fish stocks, including migratory patterns and breeding habits,⁸⁵ which may not be available when such determinations become economically or politically necessary.

Despite the possible void of information, the attractiveness of the concept of MSY is: (1) its focus on maximization of fish production; (2) the definability and simplicity of the concept itself; and (3) the availability of scientific tools that can at least reasonably approximate this value.⁸⁶ The primary objection to this highly quan-

78. See LOS Convention, *supra* note 18, art. 64.

79. LOS Convention, *supra* note 18, art. 77, para. 4.

80. LOS CASES, *supra* note 23, at 677.

81. LOS Convention, *supra* note 18, art. 77.

82. *Id.* art. 68.

83. Burke, *supra* note 60, at 47.

84. See LOS Convention, *supra* note 18, art. 61, para. 3.

85. Kronfol, *supra* note 15, at 465-66.

86. Burke, *supra* note 60, at 25.

tifiable value is that the biological objectives of MSY do not adequately incorporate the socio-economic concerns of fishery management.⁸⁷ Fishery economists have long noted that "management based on a biological objective such as MSY will inevitably result in over-capacity in the fishery and the dissipation of the potential economic benefits which might be achieved if 'optimization' involved socio-economic objectives with biological constraints."⁸⁸ For example, the use of MSY as a fishery management goal will result in a failure to weigh the opportunity costs to society of utilizing its limited resources to catch fish.⁸⁹ In any event, the objective concept of MSY is preferable to the most general concept of "optimum yield" (OY), which allows nations more latitude in determining harvestable levels.⁹⁰ Mechanisms for gathering information and standards for determining permissible catch must be developed.

The problems of landlocked and geographically disadvantaged states must also be addressed. The traditional principle of *mare liberum* guarantees all countries equal access to fisheries beyond the limits of national jurisdiction. The guarantee, however, does not promote maritime activities by the LL/GDS. The comprehensive law of the sea should allow these countries a more effective share in the common heritage.⁹¹

Finalization of the LOS Convention was an important step toward resolving international fisheries problems, because the International Court of Justice (ICJ) stated in the *Fisheries Jurisdiction Case* that in lieu of a LOS Treaty which was in force, proposals arising out of UNCLOS III were to be considered as only the opinions of individual countries.⁹² For even a binding agreement to effectively solve fisheries problems, procedures are required to avoid and arbitrate disputes and to enforce substantive provisions.

C. HISTORICAL BACKGROUND

Fishery management and conservation are relatively new problems. Before 1900, fishery resources seemed unlimited, and fishing nations generally exploited resources as their capabilities and need

87. *Id.*

88. *Id.* See generally Morey, *Fishery Economics: An Introduction And Review*, 20 NAT. RESOURCES J. 827, 830-41 (1980) [hereinafter cited as Morey].

89. Morey, *supra* note 88, at 840-41.

90. See Burke, *supra* note 60, at 28-29.

91. See Alverson, *supra* note 12, at 112.

92. *Fisheries Jurisdiction Case (U.K. v. Ice.)*, 1974 I.C.J. 3.

dictated. When the possibility of overfishing became apparent early in this century, coastal states were without effective and comprehensive means to meet the problem. An initial concern was the competition for resources between contiguous nations and the impact of the fishing fleets of distant nations.⁹³ One result was that a number of unilateral claims were made to extend jurisdiction over coastal waters.

Only thirty years ago, the three-mile territorial sea was standard, but since 1982 (at the latest), a twelve-mile limit has been almost universally accepted.⁹⁴ One of the first important claims to extended ocean resource jurisdiction was asserted in the Truman Proclamations of 1945,⁹⁵ whereby the United States claimed jurisdiction over fisheries and other resources in waters contiguous to the coast of the United States. As a result of this action, the policy of unilaterally claiming sovereignty over offshore resources became a trend in international policy.⁹⁶ Unilateral extensions of coastal state jurisdiction first became prevalent in South America.⁹⁷ In 1947, Chile claimed a 200-mile resource zone in an attempt to protect its whaling industry.⁹⁸ In the same year, Peru declared 200-mile jurisdiction in an attempt to protect its anchovies.⁹⁹ In 1952, several South American States joined in the Santiago Declaration, the first multilateral agreement proclaiming exclusive jurisdiction for particular purposes.¹⁰⁰ The concept of a 200-mile zone was rejected at the Second U.N. Conference on the Law of the Sea (UNCLOS II)

93. Comment, *Fishery And Economic Zones As Customary International Law*, 17 SAN DIEGO L. REV. 661, 664 (1980) [hereinafter cited as *Fishery Zones*].

94. See LOS Convention, *supra* note 18, art. 3; Copes, *supra* note 10, at 234.

95. For a reprint of the Truman Proclamations, see *Policy of the United States With Respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf*, Pres. Proc. No. 2667, 3 C.F.R. 67 (1943-48 Compilation), and *Policy of the United States With Respect to Coastal Fisheries in Certain Areas of the High Seas*, Pres. Proc. No. 2668, 3 C.F.R. 68 (1943-48 Compilation). See also *Fishery Zones*, *supra* note 90, at 664; Jones, *Freedom Of Fishing In Decline: The Fishery Conservation And Management Act Of 1976 And The Implications For Japan*, 11 CAL. W. INT'L L.J. 52, 67 (1981) [hereinafter cited as *Fishing Decline*].

96. *Fishery Zones*, *supra* note 93, at 664.

97. *Id.*

98. *Id.* at 664-65.

99. *Id.* at 665.

100. Agreements between Chile, Ecuador and Peru, signed at the First Conference on the Exploitation and Conservation of the Maritime Resources of the South Pacific, Santiago, 18 August 1952, Declaration on the Maritime Zone, U.N. Doc. ST/LEG/SER.B/6, at 723-24 (1957) and U.N. Doc. A/AC.135/10/Rev.1, at 9-10 (1968). See Mirvahabi, *Significant Fishery Management Issues in the Law of the Sea Conference: Illusions and Realities*, 15 SAN DIEGO L. REV. 493, 496-97 (1978) [hereinafter cited as Mirvahabi].

in 1958. The countries at UNCLOS II also failed to reach agreement on the permissible extent of the territorial sea, although they did define all maritime area beyond the territorial sea to be high seas outside the control of any single nation.¹⁰¹

Coastal states have justified unilateral extensions of maritime jurisdiction by claiming the need for authoritative regulation to achieve rational management and conservation and for protection of vital national interests.¹⁰² The ICJ gave support to these claims in the *Fisheries Jurisdiction Case*.¹⁰³ The Court recognized that a coastal state dependent on its coastal fisheries has preferential rights to coastal stocks paramount to the interests of other countries who wish to exploit the same resources.¹⁰⁴

Even so, assertions of full 200-mile "economic zones" were few until the enactment of the FCMA. When the United States unilaterally declared a 200-mile "fishery jurisdiction" via the FCMA, the number of 200-mile claims mushroomed, and thereafter, it appeared that such limits would attain universal acceptance. All of the major North American countries have now established such a zone as have the European Common Market countries, Iceland, Norway, and the U.S.S.R.¹⁰⁵ By 1977, thirty-six countries had claimed some form of 200-mile zone,¹⁰⁶ and more than a hundred delegates to the first UNCLOS III session in Caracas supported this development.¹⁰⁷ The debate continues, however, over the rights and duties of the coastal state within this area.¹⁰⁸ The potential impact on fisheries of claims to 200-mile zones is clear. If all coastal states claimed 200-mile zones, the area enclosed would account for ninety-four percent of the world's fish catch.¹⁰⁹

Approximately one-fifth of the world's fishery resources are located within 200 miles of the U.S. coastline.¹¹⁰ The FCMA grants the United States exclusive control of virtually all of the living marine resources within this zone,¹¹¹ an area encompassing almost

101. See *Regional Approach*, *supra* note 41, at 175.

102. See *Copes*, *supra* note 10, at 234.

103. *Fisheries Jurisdiction Case* (U.K. v. Ice.), 1974 I.C.J. 3.

104. *Id.* at 26.

105. *Copes*, *supra* note 10, at 234-35.

106. *Regional Approach*, *supra* note 41, at 174.

107. *Mirvahabi*, *supra* note 100, at 497.

108. *Id.* at 497-98.

109. *Fishing Decline*, *supra* note 95, at 73-74.

110. OFFICE OF TECHNOLOGY ASSESSMENT, ESTABLISHING A 200-MILE FISHERIES ZONE, 3 (1977) [hereinafter cited as 200-MILE ZONE].

111. *Warner*, *supra* note 8, at 97.

2,250,000 square miles of ocean space.¹¹² The purpose of the FCMA is to establish a fishery conservation zone, which is adjacent to the coast of the United States in order to effectively manage and conserve fishery resources.¹¹³ In passing the FCMA, Congress noted that certain stocks of fish off the coasts of the United States had "been overfished to the point where their survival is threatened and other such stocks have been so substantially reduced in number that they could become similarly threatened."¹¹⁴ The FCMA purports to strike a balance between exploitation and conservation of fisheries resources; however, the language of the Act weighs heavily in favor of conservation.¹¹⁵ The FCMA authorizes eight regional fishery management councils which are responsible for developing fishery management plans.¹¹⁶ These management plans, among other things, identify the optimum yield which can be harvested annually in each fishery, and they determine the allowable level of foreign fishing.¹¹⁷ Under the FCMA, the OY is determined by first establishing the MSY.¹¹⁸

MSY is the biological determination of the number of "surplus" fish that can be caught without overfishing the stock in question. It is, in essence, the surplus production of the fishery; the safe upper limit of harvest which can be taken consistently year after year without diminishing the stock so that the stock is truly inexhaustible and perpetually renewable.¹¹⁹

The MSY is then modified by relevant ecological, economic, and social factors to arrive at OY.¹²⁰ The Secretary of Commerce is delegated the responsibility of reviewing and approving each of the plans submitted by the councils, and the Secretary of State is responsible for allocating any surplus fisheries harvest among the various foreign nations.¹²¹

112. 200-MILE ZONE, *supra* note 110, at 24.

113. *Fishery Conservation and Management Act: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 96th Cong., 1st Sess. 171 (1979) [hereinafter cited as *FCMA Hearings*].

114. 200-MILE ZONE, *supra* note 110, at 4.

115. Warner, Finamore, & Bean, *Practical Application Of The Conservation Aspects Of The Fishery Conservation And Management Act*, 5 HARV. ENVTL. L. REV. 30, 49 (1981) [hereinafter cited as *Finamore*].

116. *Id.* at 33; see *FCMA Hearings*, *supra* note 113, at 171.

117. See *FCMA Hearings*, *supra* note 113, at 171.

118. *Finamore*, *supra* note 115, at 39-40.

119. *Id.* at 39.

120. *Id.* at 41.

121. *FCMA Hearings*, *supra* note 113, at 171; *Finamore*, *supra* note 115, at 34-35.

In addition to conserving fisheries resources, one of the main objectives of the FCMA is to give preference to U.S. fishermen operating within the 200-mile zone of the United States.¹²² This objective appears to have been accomplished, at least in part. In 1974, foreign fishermen harvested 3.1 million metric tons of fish in U.S. waters. In 1977, however, subsequent to the passage of the FCMA, foreign fishermen harvested only 1.7 million metric tons.¹²³ The number of foreign fishing vessels in this zone was reduced from 2,700 per year to approximately 933.¹²⁴ Additional enforcement measures taken by the U.S. Coast Guard and/or the use of remote-sensing devices might further reduce the harvest by foreign fishermen.¹²⁵

The U.S. fishing industry has generally increased in importance in international and domestic trade as a result of the FCMA.¹²⁶ The value of fish caught from 3 to 200 miles off U.S. shores exceeds \$1 billion per annum.¹²⁷ The value of fish resources within the 200-mile zone will continue to grow with the utilization of new technologies. For example, the United States is constructing processing barges which will be placed within the fishing grounds. These barges will allow rapid processing of catches and will save fishermen the expense of taking their catches to shore-based facilities. Although the demand for fish in the United States far exceeds the available domestic supply, the U.S. industry is beginning "to produce domestic equivalents for many of these imports."¹²⁸ The foreign demand for U.S. fish products has grown since passage of the FCMA, and exports have more than doubled since 1976.¹²⁹ In short, some available statistics indicate that the FCMA has encouraged growth in the U.S. commercial fisheries.¹³⁰ From a foreign policy perspective, however, the FCMA was a mistake because it hamstrung the U.S. negotiators at UNCLOS III and encouraged the rest of the international community to assert similar claims (a cost

122. *FCMA Hearings*, *supra* note 113, at 171; Warner, *supra* note 8, at 98.

123. *FCMA Hearings*, *supra* note 113, at 171-72.

124. *Id.* at 174 (statement of James Walsh, Deputy Administrator, National Oceanic and Atmospheric Administration).

125. *See* 200-MILE ZONE, *supra* note 110, at 38-47.

126. Warner, *supra* note 8, at 98.

127. *Id.*; FISHERIES 1982, *supra* note 4, at 11.

128. Warner, *supra* note 8, at 98.

129. *Id.*; FISHERIES 1982, *supra* note 4, at 49.

130. Warner, *supra* note 8, at 98.

which will eventually outweigh the short-term economic benefits of the FCMA).

The passage of the FCMA had far reaching implications for those nations dependent upon distant-water fishing, particularly Japan.¹³¹ Continued access to U.S. fishing grounds, especially the productive area off the coast of Alaska, was and is vital to Japan as a food source.¹³² In 1975, Japanese fishing boats caught approximately 1.4 million metric tons of fish within the U.S. 200-mile zone.¹³³ The FCMA reduced the Japanese catch, and costs to each Japanese fisherman increased as fees were imposed on foreign vessels working American fishing grounds.¹³⁴ Japan has warned that massive unemployment and political upheaval could result from the extension of "offshore jurisdiction to reduce Japan's fishing quotas in the North Pacific."¹³⁵

Despite the international impact of the FCMA, some studies indicate that the overall performance of the U.S. fishing industry subsequent to the passage of the FCMA has been disappointing.¹³⁶ The preferential access provided to U.S. fishermen under the FCMA did not produce a "substantial economic growth or a net increase in harvest over foreign fisherman."¹³⁷ In 1979, it was reported that the United States had a balance of payment deficit in fishery products in excess of \$2.1 billion, and foreign fishermen were still harvesting between one-third and one-half of the fish taken in U.S. waters.¹³⁸ Congress responded by enacting the American Fisheries Promotion Act of 1980 (AFPA),¹³⁹ which amended the FCMA. The AFPA was designed to attract increased investment to the U.S. fishing industry and to increase the U.S. market share. The AFPA affects all foreign nations fishing within the U.S. 200-mile fishery

131. *Fishing Decline*, *supra* note 95, at 56.

132. *Id.* at 53.

133. *Id.* at 56.

134. *Id.* at 56-57.

135. *Id.* at 96.

136. Note, *Fishery Conservation: Is The Categorical Exclusion Of Foreign Fleets The Next Step?*, 12 CAL. W. INT'L L.J. 154, 176 (1982) [hereinafter cited as *Exclusion Of Fleets*].

137. *Id.*

138. *National Fishery Development Act: Hearing Before the Senate Comm. on Commerce, Science, and Transportation*, 96th Cong., 1st Sess. 1 (1979).

139. Pub. L. No. 96-561, tit. II, pt. C, 94 Stat. 3287 (1980) (codified at scattered sections of 15, 16, 22, 43 & 46 U.S.C. (Supp. V 1981)). Section 238 changes the official title of the FCMA to the Magnuson Fishery Conservation and Management Act (MFCMA) (codified at 16 U.S.C. § 1801).

conservation zone by: (1) increasing the permit fees imposed on foreign fishermen;¹⁴⁰ (2) requiring, with limited exceptions, the presence of a U.S. observer aboard each individual foreign fishing vessel within the 200-mile zone;¹⁴¹ (3) directing the Secretaries of State and Commerce to review the extent to which foreign countries restrict market access to U.S. fish products;¹⁴² (4) directing the Secretaries to consider the extent to which foreign countries cooperate with the enforcement of U.S. fishing regulations and the operation of the domestic fishing industry;¹⁴³ and (5) establishing a mechanism which under certain circumstances would completely phase out foreign fishing within the 200-mile zone.¹⁴⁴

The primary criticism of the AFPA concerns the mandatory phase-out provision.¹⁴⁵ Under a new method of calculation established in the AFPA, it is possible that even though there is a surplus of fish, foreign fishing can be phased out completely with regard to a particular fishery.¹⁴⁶ By precluding foreign fishermen from catching the available surplus of U.S. fish, this provision appears to violate the letter and spirit of article 62 of the LOS Convention.¹⁴⁷ Proponents of the AFPA claim that the phase-out provision is consistent with the LOS Convention which permits a coastal state to protect and manage¹⁴⁸ the living resources within this 200-mile zone.¹⁴⁹ It is claimed that while the objectives of the LOS Convention are to create an "optimum utilization of the living resources"¹⁵⁰ and to "produce the maximum sustainable yield,"¹⁵¹ these goals are qualified by relevant economic factors.¹⁵² "These qualifications demonstrate that there is no absolute right of foreign states to the surplus of fish in the 200-mile zones."¹⁵³ Thus, the LOS Convention

140. *Id.* § 232.

141. *Id.* § 236.

142. *Id.* § 231.

143. *Id.*

144. *Id.* § 230; see Recent Development, *Law Of The Sea: Protection Of United States Fishing Interests—American Fisheries Promotion Act of 1980*, 22 HARV. INT'L L.J. 485, 485 (1981) [hereinafter cited as *Fishing Interests*].

145. *Fishing Interests*, *supra* note 144, at 488.

146. *Id.* at 487-88.

147. *Id.* at 488-89; see Burke, *supra* note 60, at 54.

148. LOS Convention, *supra* note 18, art. 61.

149. *Fishing Interests*, *supra* note 144, at 489.

150. LOS Convention, *supra* note 18, art. 62, para. 1.

151. *Id.* art 61, para. 3.

152. *Id.*; *Fishing Interests*, *supra* note 144, at 489.

153. *Fishing Interests*, *supra* note 144, at 489.

may permit the United States to temporarily preclude the harvesting of surplus fish in light of its economic interests.¹⁵⁴

It is at least "arguable that the 'optimum yield' approach of the FCMA, which made it less likely that foreign fishermen would be precluded from harvesting the United States surplus, better reflects prevailing views"¹⁵⁵ under the LOS Convention than does the rigid formula of the AFPA. Nonetheless, Congress has considered legislation¹⁵⁶ that would go one step further and require a total phase-out of foreign fishing.¹⁵⁷ In spite of the 1980 amendment to the FCMA, the United States has experienced only a slight increase in its processed fish products since the passage of the FCMA.¹⁵⁸ In 1982, the foreign fish catch (excluding tuna) within the U.S. 200-mile zone was 1.4 million metric tons, while the combined fish catch by U.S. and foreign vessels within the 200-mile zone was only 2.5 million metric tons.¹⁵⁹ Despite these facts, the United States should proceed to provide for increased refinement and enforcement of the FCMA.¹⁶⁰ The categorical exclusion of foreign fishing fleets from the U.S. 200-mile zone, however, would violate international law and would result in adverse foreign reactions.¹⁶¹ Although the United States may unilaterally terminate its reciprocal bilateral agreements, the United States could expect retaliation from other countries through similar phase-out programs which would adversely affect the U.S. fishing industry.¹⁶²

D. TRENDS AND CONDITIONING FACTORS

Many scholars find the overwhelming acceptance of the 200-mile economic zone disturbing. While the concept is supposed to preserve the preferential rights of the coastal states over coastal fisheries and to encourage rational management, the problems of such a system outweigh the benefits, and there are better ways of achieving these goals.¹⁶³

Although an open access system is generally considered

154. *Id.*

155. *Id.* at 490.

156. See H.R. 7039, 96th Cong., 2d Sess. tit. III (1980).

157. *Exclusion Of Fleets*, *supra* note 136, at 154.

158. *Id.* at 178.

159. FISHERIES 1982, *supra* note 4, at iv.

160. *Exclusion Of Fleets*, *supra* note 136, at 203.

161. *Id.*

162. *Id.*

163. See *Regional Approach*, *supra* note 41, at 176.

economically and biologically inefficient, management solely by national coastal zones has been deemed equally inadequate.¹⁶⁴ As few species are contained within the coastal waters of a single country, the 200-mile zone concept is inadequate.¹⁶⁵ The interests of neighboring countries sharing common fishery resources will conflict under a system of coastal state management, and in the case of highly migratory species, conflicts will remain between the coastal state and those nations fishing beyond the 200-mile zone.¹⁶⁶ Even prior to the finalization of LOS Convention, national fisheries legislation demonstrated an awareness of the provisions in the earlier negotiating texts and a desire to comply with them.¹⁶⁷ Consequently most legislation claims greater control over the 200-mile zone while at least providing for the possibility of foreign fishing.¹⁶⁸ The emphasis however, is on coastal state control over "access to surplus," not the obligation of the coastal state to permit access.¹⁶⁹

The trend toward this new ocean regime has been spurred by the quest of developing countries to obtain a degree of equalization with other countries by asserting sovereignty over natural resources.¹⁷⁰ Although some countries, such as Japan, initially resisted the 200-mile zone concept, they eventually recognized the need to acquiesce to the inevitability of this trend, the need to protect their own resources, and the opportunity to enhance their own bargaining position by establishing their own 200-mile zones.¹⁷¹

The U.S. 200-mile zone is also increasing in importance because of the political leverage it provides. In 1980, the United States reacted to the U.S.S.R.'s invasion of Afghanistan by imposing economic sanctions. The United States announced that it would withhold sales of high technology equipment and grain and that the Soviet Union's fishing privileges within U.S. waters would be severely curtailed. Thus, the 200-mile zone concept provides an additional opportunity to use the world's food resources as a political

164. Prewo, *supra* note 1, at 265-66, 270.

165. *Id.* at 270-71.

166. *Id.* at 271.

167. Moore, *National Legislation for the Management of Fisheries Under Extended Coastal State Jurisdiction*, 11 J. MAR. L. & COM. 153, 176 (1980).

168. *Id.*

169. *Id.*

170. Kuribayashi, *The New Ocean Regime and Japan*, 11 OCEAN DEV. & INT'L L.J. 95, 113-14 (1982).

171. *Id.* at 116; *Fishing Decline*, *supra* note 95, at 101-03; see Anand, *The Politics of a New Legal Order for Fisheries*, 11 OCEAN DEV. & INT'L L.J. 265, 282 (1982).

weapon, although such action would appear to violate the LOS Convention if no reallocation of the surplus is made.

E. POLICY ALTERNATIVES AND RECOMMENDATIONS

There are two policy alternatives in the area of fisheries management and conservation, excluding the possibility of surrendering all jurisdiction to the unilateral desires of coastal states. The first is the implementation of the common heritage principle on a global scale. The common heritage principle was an integral part of the UNCLOS III negotiations involving the deep sea-bed, but it can also be applied to living resources.

Under this alternative, a global agency responsible for fisheries management and conservation would be established. The focus of such an agency would be on the efficient and equitable control of resources, and not on the spatial acquisition of territory.¹⁷² This global organization would provide technical service to each country and assist in the collection and collation of the voluminous biological and scientific data needed to meet management and conservation goals.¹⁷³ The agency would gather the necessary knowledge about unexploited stocks which it could disseminate to developing countries. More importantly, the delegation of enforcement power to a central agency would promote uniformity and effectiveness of regulation.¹⁷⁴ A successor organization to the IWC (specifically an International Cetacean Commission with expanded jurisdiction, perhaps including fisheries) would be a good initial organization for implementing the ASIL goals.

The common heritage philosophy would have to be accepted by all coastal states before such a regime could function. Otherwise, there would be no motivation for countries to surrender their present sovereignty to an international organization.¹⁷⁵ Preferential treatment of coastal states and of those nations which are heavily dependent on foreign fisheries could be implemented through such a system.¹⁷⁶ This alternative seeks a compromise between purely national control and control based on an equitable share of the living resources of the ocean.

The second alternative is actually a variation of the common

172. See Alverson, *supra* note 12, at 118.

173. *Id.*

174. *Id.* at 119.

175. *Regional Approach*, *supra* note 41, at 189.

176. See *id.* at 189-90.

heritage philosophy. It involves regional implementation of the common heritage principle through shared economic zones.¹⁷⁷ A regional approach offers the advantages of controlled resource utilization, while maintaining traditional high seas freedoms. Negotiation for access to distant fishery stocks is also simplified under such a plan. Negotiations are necessary only between the representatives of the few regional zones involved, rather than between representatives of the several individual countries.¹⁷⁸ In addition, member states of a given regional zone would not need to negotiate to fish within the EEZ's of any of its regional neighbors, since the regional "umbrella" pact would cover them all.¹⁷⁹

Intraregional political cooperation between developing countries in offshore fishery management might also extend to other arenas giving them a solidarity and power which they lack individually.¹⁸⁰ Regional cooperation might also lead to large scale economic integration analogous to that of the European Common Market.¹⁸¹ Economic cooperation would allow developing nations to exploit more fully both the marine and land-based natural resources in their region.¹⁸²

The regional approach is probably more viable. The trend toward unilateral claims of complete sovereignty over coastal waters is blunted by regional arrangements. A coastal state would hesitate to risk losing the economic support of its regional neighbors to achieve total control over an area in which it already enjoyed beneficial control. In addition, the interests of both landlocked and coastal states could be met more effectively.¹⁸³

The regional approach requires coordination of legal claims between those nations participating in the regional agreement. It is consistent with, although not required by, the LOS Convention and has certain advantages. Individual nations may decide that there is greater security in protecting their shared regional interests, reducing the possibility of excessive territorial seas.¹⁸⁴ A regional approach would also be easy to incorporate into the framework of

177. *Id.* at 190.

178. *Id.* at 192.

179. *Id.* at 190-92; see Alexander, *Regional Arrangements In The Oceans*, 71 AM. J. INT'L L. 84, 101 (1977).

180. *Regional Approach*, *supra* note 41, at 192-93.

181. *Id.* at 193.

182. *Id.*

183. *See id.* at 193-94.

184. *Id.* at 195.

the LOS Convention. The major shortfall of the proposal is that it does not effectively utilize the concept of the common heritage.¹⁸⁵ Equitable distribution of resources, stability of the regional zones, and effective conservation measures would probably not be fully accomplished.¹⁸⁶

This proposal for a regional authority would require the countries of a region to surrender at least part of their jurisdictional authority over their respective fishery zones to a regional body comparable to the world agency discussed earlier. Under such a regime, "a single off-shore area would be created and managed by the regional authority."¹⁸⁷

One large zone would be more likely to include a greater portion of a fishery stock, thereby making any conservation measures more effective. The participation of landlocked states in the combined zones would benefit the region through multinational interaction and regional solidarity.¹⁸⁸ Special interests of countries in the region could easily be taken into account. Fishing quotas and specific allowances could be granted to landlocked states in exchange for economic considerations.¹⁸⁹

Both global and regional schemes have their strengths and weaknesses, but after balancing the equities, the better and more practical course of action involves implementation of the regional approach. Whether regional zones are established through ad hoc regional cooperation or through a regional authority is not critical. The impact of such a system could be lessened by first instituting regional cooperation and then, if the situation warrants, moving toward a regional authority. The problems involving the management and conservation of fishery stocks are crucial and must be solved if the ocean is to continue providing for mankind.

After the initial U.S. blunder of enacting the FCMA and thereby unilaterally extending U.S. fisheries jurisdiction to 200 miles, the United States tried to mitigate the international impact of the FCMA by utilizing bilateral and regional fishery arrangements, particularly bilateral "Agreements Concerning Fisheries off the Coasts of the United States" which are popularly termed "Governing International Fishery Agreements" (GIFA's).

185. *Id.* at 196.

186. *Id.* at 195-96.

187. *Id.* at 197-98.

188. *Id.* at 198.

189. *Id.* at 198-200.

While the FCMA, as modified by AFPA, constitutes the major U.S. legislation governing fisheries, other related U.S. legislation includes:

- a. the State Commercial Fisheries Research and Development Act of 1964,¹⁹⁰
 - b. the Anadromous Fish Conservation Act of 1965 (AFCA),¹⁹¹
 - c. the Endangered Species Act of 1973,¹⁹²
 - d. the Salmon and Steelhead Conservation and Enhancement Act of 1980,¹⁹³
 - e. the Atlantic Salmon Convention Act of 1982,¹⁹⁴
 - f. the Coastal Zone Management Act of 1972 (CZMA),¹⁹⁵
 - g. the Marine Mammal Protection Act of 1972 (MMPA),¹⁹⁶
 - h. the Estuarine Areas Act of 1968,¹⁹⁷
 - i. the Fish and Wildlife Coordination Act of 1958 (FWCA),¹⁹⁸
- and
- j. the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (PNEPPCA).¹⁹⁹

The CZMA provides grants to states to develop and administer programs for managing resources and uses within their coastal areas. This program was supplemented and revised under the FCMA, which established the eight Regional Fishery Management Councils.²⁰⁰

Since the FWCA failed to adequately protect the fish and wildlife of the Columbia River Basin of the Pacific Northwest, Congress enacted the PNEPPCA in 1980.²⁰¹ The Columbia Basin supplies about eighty percent of the area's electric energy needs while supporting the world's largest runs of steelhead trout and chinook

190. 16 U.S.C. § 779 (1976 & Supp. V 1981).

191. *Id.* § 757a (1976 & Supp. V 1981).

192. *Id.* §§ 1531-1543 (1976 & Supp. V 1981).

193. Pub. L. No. 96-561, tit. I, 94 Stat. 3275 (1980) (codified at scattered sections of 16 U.S.C. (Supp. V 1981)).

194. 16 U.S.C. § 3601 (1982).

195. *Id.* §§ 1451-64 (1976 & Supp. V. 1981).

196. *Id.* §§ 1361-1407 (1976 & Supp. V 1981).

197. *Id.* §§ 1221-26 (1976 & Supp. V 1981).

198. *Id.* §§ 661-668ee (1976 & Supp. V 1981).

199. *Id.* §§ 839-839h (Supp. V 1981).

200. See Smith, *Management Of Living Resources*, in *MANAGING NATIONAL OCEAN RESOURCES* 57, 58 (Center for Oceans Law & Policy, Jan. 1979).

201. Blumm, *Fulfilling The Parity Promise: A Perspective On Scientific Proof, Economic Cost, And Indian Treaty Rights In The Approval Of The Columbia Basin Fish And Wildlife Program*, 13 ENVTL. L. 103, 156-57 (1982).

salmon.²⁰² The two "in-stream" uses of the Columbia Basin, hydroelectric power generation and anadromous fish protection, have come into conflict²⁰³ causing a decline in anadromous fish runs. This Act "offers the promise of belatedly elevating fish and wildlife considerations to equal status with the other purposes for which Columbia Basin water projects are operated."²⁰⁴ Thus the PNEPPCA should serve to protect the coastal fisheries and to resurrect the Indian treaty right to have the fishing resources maintained free of manmade despoliation.²⁰⁵

In the two years subsequent to enactment of the FCMA, U.S. harvests of fish stocks in the 200-mile zone were approximately 700,000 metric tons per annum while the foreign catch in the same waters totalled 1.8 million metric tons; however, 1.9 million metric tons of the total catch of 2.5 million metric tons was taken within the U.S. three-mile limit.²⁰⁶ Therefore, these figures refute to some extent the exaggerated claims of numerous fish stocks between the three-mile and 200-mile limits. Such claims constituted a primary argument for enacting the FCMA. In any event, the U.S. annual catch contributes approximately \$7 billion to the gross national product of the United States.²⁰⁷

In an attempt to fully utilize resources within the 200-mile zone, Congress proposed a bill which would have promoted the development of an American fishing industry in certain underutilized species (AMFISH).²⁰⁸ It purported to further the objectives of the FCMA and defined an underutilized species as one for which a total allowable level of foreign fishing has been determined in accordance

202. Blumm, *Hydropower vs. Salmon: The Struggle Of The Pacific Northwest's Anadromous Fish Resources For A Peaceful Coexistence With The Federal Columbia River Power System*, 11 ENVTL. L. 211, 212-13 (1981).

203. *Id.* at 213.

204. Blumm & Johnson, *Promising A Process For Parity: The Pacific Northwest Electric Power Planning And Conservation Act And Anadromous Fish Protection*, 11 ENVTL. L. 497, 499 (1981).

205. *Id.* at 533; see Note, *United States v. Washington: Implied Treaty Rights To Continue Fishing*, 18 WILLAMETTE L. REV. 659, 672 (1982). See generally Landau, *Empty Victories: Indian Treaty Fishing Rights In The Pacific Northwest*, 10 ENVTL. L. 413 (1980); *Washington State's Salmon And Steelhead Resources: Hearings Before the Senate Comm. on Commerce, Science, and Transportation*, 96th Cong., 2d Sess. (1980).

206. Cong. Research Serv., *Fisheries Development 2* (Issue Brief No. IB 79112, July 15, 1980).

207. *Id.* at 1.

208. Underutilized Species Development Act of 1979, H.R. REP. NO. 4360, 96th Cong., 1st Sess. (1979).

with the FCMA, section 201(d).²⁰⁹ This bill met resistance because it was designed to permit foreign-built and foreign-flag fishing vessels to participate in the U.S. harvest, and this was viewed as counterproductive to the FCMA policy of phasing out foreign fishing.²¹⁰

Another plan suggested to help increase the yields of the U.S. fishing industry would require processors to draw vessels away from overcapitalized segments of the industry in order to develop underutilized markets.²¹¹ In 1979, for example, the entire quota of king crab was harvested in just twenty-eight days.²¹² The underutilized U.S. vessels could be used to develop the Alaskan ground fish harvest, which during the early 1980's was taken almost entirely by foreign nations.²¹³

Tax deferrals have also been proposed as a means of encouraging growth within the U.S. fishing industry.²¹⁴ Since harvesting capacity has exceeded the capabilities of processing facilities, it has been suggested that those tax deferral provisions which encourage the acquisition of additional vessels should be extended to provide similar incentives for the new construction of shoreside processing facilities.²¹⁵

Private salmon ranching in the ocean has become another profitable development in the Pacific coast fishing industry.²¹⁶ Salmon are raised in hatcheries from the egg to the smolt stage.²¹⁷ Then they are released from coastal facilities, and a small percentage of these salmon will return to spawn eighteen to fifty months later.²¹⁸ After ascending the fish ladders into the facilities from which they were released, they are harvested and processed for market.²¹⁹

209. *Amfish: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and Environment of the House Comm. on Merchant Marine and Fisheries*, 96th Cong., 1st Sess. 1, 3 (1979).

210. *Id.* at 1-2.

211. Stokes & Offord, *Alaska Groundfish: A Financial Feasibility Analysis*, 9 OCEAN DEV. & INT'L L.J. 61, 75 (1981).

212. *Id.* at 75-76.

213. *Id.* at 62.

214. *Capital Construction Fund for Fishery Processing Facilities: Hearing Before the Subcomm. on Merchant Marine of the Senate Comm. on Commerce, Science, and Transportation*, 98th Cong., 1st Sess. 1-2 (1983).

215. *Id.*

216. Berg, *Private Ocean Ranching Of Pacific Salmon And Fishery Management: A Problem Of Federalism*, 12 ENVTL. L. 81, 81 (1981).

217. *Id.* at 83.

218. *Id.* at 83-84.

219. *Id.* at 84.

Although the ecological implications of ocean ranching are not fully understood, it is fast becoming a significant fishery industry.²²⁰

III. SUMMARY OF THE LAW OF THE SEA PROVISIONS

The LOS Convention and the FCMA illustrate the problems of managing fish stocks through unilateral, coastal state competence. The meanings of the words "maximum sustainable yield," "optimum yield," and "full utilization" determine the degree to which the resources will be harvested and to whom they will be allocated. As a point of information, the language "optimum utilization" in the LOS Convention has replaced "optimum yield" in earlier drafts, but the concepts have remained similar. As indicated earlier, under the LOS Convention a coastal state has the right to determine the allowable catch of fish stocks within its economic zone as part of maintaining the maximum sustainable yield of those stocks and determining their optimum utilization.²²¹ Article 61, paragraph 3, of the LOS Convention provides that a coastal state shall implement conservation and management measures "designed to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors"²²² A secondary requirement under article 62, paragraph 1, appears to obligate a coastal state to "promote the objective of optimum utilization of the living resources in the exclusive economic zone without prejudice to article 61."²²³ Under these provisions, MSY appears to be a scientific determination made by the coastal state within certain parameters, while OY appears to be more of an obligation to allow other countries to harvest those stocks (up to the MSY) which the coastal state does not harvest.²²⁴ In this context, either the words "optimum utilization" should be stricken from article 64 governing highly migratory species, or more appropriately, "cetaceans" should be deleted from annex I and thus from the jurisdiction of article 64.²²⁵

By contrast, the MSY and OY are mentioned neither in article 66 governing anadromous species²²⁶ (which spawn in fresh water and spend most of their lives in salt water) nor in article 67 govern-

220. *Id.* at 130.

221. Kronfol, *supra* note 15, at 464; see Burke, *supra* note 60, at 29.

222. LOS Convention, *supra* note 18, art. 61, para. 3.

223. *Id.* art. 62, para. 1.

224. See *id.* arts. 61-62.

225. *Id.* art. 64 & Annex I.

226. LOS Convention, *supra* note 18, art. 66.

ing catadromous species (which spawn in salt water and spend most of their lives in fresh water).²²⁷ For anadromous stocks, the jurisdiction of the coastal state in whose waters they spawn follows them wherever they swim.²²⁸ Catadromous species are under the jurisdiction of the coastal state in whose waters they spend most of their life cycle.²²⁹ Sedentary species are not governed by this part of the LOS Convention.²³⁰

A main problem in this area involves the way in which the concepts of MSY and OY interface with the "full utilization" requirements under the FCMA.²³¹ In this context, Professor William Burke has highlighted the need for more precise definitions and scientific information.²³² In interpreting the FCMA, there is little reason to concede that:

MSY may only supplant OY if biological and other data are inadequate. Modification of MSY to OY, which can be more or less than MSY, is to be based on other relevant factors, remembering that optimum with respect to a fishery's yield means providing the greatest overall benefit to the Nation, especially in terms of food production.

A council [i.e., one of eight councils established under the FCMA] may have perfectly adequate biological, economic, social, and ecological data, the political relevance of which impels its members to set an OY equal to MSY. Without some or all of these data, it is politic to adhere to MSY, which is generally understood, than to depart from this figure for a more speculative, less comprehensible OY. There may be no useful social and economic data with which to modify MSY.

In real terms, OY must be defined by councils' actions. It may be defined as something other than a number in metric tons.²³³

As the Fishery Management Plans (FMP's) being prepared by the FCMA regional councils are "primarily done by biologists, maximum sustainable yield, a biological concept, and not optimum yield as defined in the FCMA is the controlling factor in regulations pro-

227. *Id.* art. 67.

228. *Id.* art. 66, para. 1.

229. *Id.*

230. *Id.* art. 68.

231. *FCMA Hearings*, *supra* note 113, at 844-45 (statement of Langdon Warner, Science Associate, Environmental Defense Fund); *see Burke*, *supra* note 60, at 24-35.

232. *See Burke*, *supra* note 60, at 24-35.

233. *FCMA Hearings*, *supra* note 113, at 828, 830 (statement of Tom Reynolds, Executive Director, National Fish Meal and Oil Association).

mulgated by the Councils.”²³⁴ In addition, there is “the lack of socio-economic data available for inclusion into the FMP’s resulting essentially in MSY being renamed OY.”²³⁵ Accordingly, definitions must be clarified, and the standards for preparing FMP’s must be made uniform.²³⁶ The Environmental Defense Fund has suggested that the definition of MSY under the FCMA be modified in part to mean “the largest [average] annual catch or yield in terms of weight of fish caught by both commercial and recreational fishermen that can be taken [continuously] from a stock *without forcing it below a specified minimum population level and structure* [under existing environmental conditions].”²³⁷

Instead of debating definitions, a better approach to a solution might be to implement:

- a. a regionally coordinated, nationwide system for collecting marine recreational fishing statistics;
- b. ecological research, including stock assessment and comprehensive predator-prey studies; and
- c. the identification of social and economic data needs and priorities and development of cost effective methodologies for collecting these data.²³⁸

This appears to be the best solution. In any event, this situation involving the FMP’s and the FCMA needs to be resolved before adequate protection of U.S. fish stocks can be accomplished. Additionally, any final determinations should conform to the MSY and OY concepts formulated in articles 61 and 62 of the LOS Convention.²³⁹

234. *Id.* at 902, 903 (statement of W.F. “Zeke” Grader, President, Western Region of the National Federation of Fishermen).

235. *Id.* at 903.

236. *Id.*

237. *Id.* at 848, 865-66 (petition of the Environmental Defense Fund for the Amendment of the Guidelines for Development of Fishery Management Plans) (inserts and emphasis original).

238. *Id.* at 992-94 (communication submitted by Ronald F. Labisky).

239. *See* LOS Convention, *supra* note 18, arts. 61-62.

APPENDIX I

1979 and 1980 Nominal Catches: By Species Groups
(in metric tons)

	1979	1980
FRESHWATER FISHES: Nominal catches by species, major fishing areas and countries		
Carps, barbels and other cyprinids	597,404	616,167
Tilapias and other cichlids	363,942	367,421
Miscellaneous freshwater fishes	5,023,054	5,213,278
DIADROMOUS FISHES: Nominal catches by species, major fishing areas and countries		
Sturgeons, paddlefishes, etc.	28,781	29,117
River eels	85,197	91,636
Salmons, trouts, smelts, etc.	750,718	770,276
Shads, milkfishes, etc.	770,399	817,990
Miscellaneous diadromous fishes	154,704	125,295
MARINE FISHES: Nominal catches by species, major fishing areas and countries		
Flounders, halibuts, soles, etc.	1,145,559	1,084,367
Cods, hakes, haddockes, etc.	10,608,533	10,719,675
Redfishes, basses, congers, etc.	5,357,953	5,247,227
Jacks, mullets, sauries, etc.	7,950,863	7,338,318
Herrings, sardines, anchovies, etc.	15,719,039	16,225,200
Tunas, bonitos, billfishes, etc.	2,384,854	2,489,795
Mackerels, snoeks, cutlassfishes, etc.	4,414,932	4,226,312
Sharks, rays, chimaeras, etc.	579,723	582,957
Miscellaneous marine fishes	7,064,305	7,581,510
CRUSTACEANS: Nominal catches by species, major fishing areas and countries.		
Freshwater crustaceans	91,433	82,787
Sea-spiders, crabs, etc.	836,647	848,256
Lobsters, spiny-rock lobsters etc.	111,483	108,134
Squat-lobsters, nephrops, etc.	76,674	56,227
Shrimps, prawns, etc.	1,560,507	1,680,954
Krill, prawns, etc.	386,882	424,821
Miscellaneous marine crustaceans	71,152	66,115
MOLLUSCS: Nominal catches by species, major fishing areas and countries		
Freshwater molluscs	255,180	266,588
Abalones, winkles, conchs, etc.	72,460	86,595
Oysters	873,060	972,885
Mussels	582,298	613,965
Scallops, pectens, etc.	398,522	364,173
Clams, cockles, arkshells, etc.	1,053,494	1,176,771
Squids, cuttlefishes, octopuses, etc.	1,558,814	1,572,098
Miscellaneous marine molluscs	143,511	165,231
WHALES, SEALS AND OTHER AQUATIC MAMMALS: Catches by species, major fishing areas and countries		
Blue-whales, fin-whales, etc.	743*	742*
Sperm-whales, pilot-whales, etc.	13,045*	—
Porpoises, dolphins, etc.	2,807*	3,769*
Eared seals, hair seals, walruses, etc.	449,035	—
Miscellaneous aquatic mammals	1,061	1,000

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MISCELLANEOUS AQUATIC ANIMALS: Nominal catches by species, major fishing areas and countries

Frogs and other amphibians	1,088	695
Turtles and other reptiles	7,377	6,248
Sea-squirts and other tunicates	4,275	5,527
Horseshoe crabs and other arachnoids	134	232
Sea-urchins and other echinoderms	65,715	55,653
Miscellaneous aquatic invertebrates	72,820	73,836

MISCELLANEOUS AQUATIC ANIMAL PRODUCTS: Production by species, major fishing areas and countries

Pearls, mother-of-pearl, shells, etc.	5,695	5,832
Corals	126	205
Sponges	104	130
Aquatic bird guano, eggs, etc.	36,189	30,288

AQUATIC PLANTS: Production by species, major fishing areas and countries

Brown seaweeds	23,537,265	2,403,389
Red seaweeds	771,771	825,178
Green seaweeds and other algae	3,403	9,449
Miscellaneous aquatic plants	89,888	78,777

*Estimates in actual numbers—not in metric tons.

Source: 50 U.N. FOOD & AGRICULTURE ORGANIZATION, YEARBOOK OF FISHERY STATISTICS 43-45, 208-12, 223-26 (1981).

APPENDIX II

Regional Fisheries Organizations

FAO-SPONSORED

CARPAS	Regional Fisheries Advisory Commission for the Southwest Atlantic
CECAF	Fishery Commission for the Eastern Central Atlantic
GFCM	General Fisheries Council for the Mediterranean
IOFC	Indian Ocean Fisheries Commission
IPFC	Indo-Pacific Fisheries Council
WECAFC	Western Central Atlantic Fishery Commission

INDEPENDENT

BSSSC	Baltic Sea Salmon Standing Committee
IATTC	Inter-American Tropical Tuna Commission
IBSFC	International Baltic Sea Fishery Commission
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICNAF	International Commission for the North-West Atlantic Fisheries
ICSEAF	International Commission for the South-East Atlantic Fisheries
INPFC	International North Pacific Fisheries Commission
IPHC	International Pacific Halibut Commission
IPSFC	International Pacific Salmon Fisheries Commission
IWC	International Whaling Commission
JKFC	Japan-Republic of Korea Joint Fisheries Commission
JSFC	Japanese-Soviet Fisheries Commission for the North-West Pacific
MC	Mixed Commission of 1962 (Baltic Sea)
MCBSF	Mixed Commission for Black Sea Fisheries
NEAFC	North-East Atlantic Fisheries Commission
NPFC	North Pacific Fur Seal Commission
PCSP	Permanent Commission of the Conference on the Use and Conservation of the Marine Resources of the South Pacific
SCNEA	Sealing Commission for the North-East Atlantic
SCSK	Shellfish Commission for the Skagerak-Kattegat

RELATED PROGRAMS AND ORGANIZATIONS

CCOP	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas
CICAR	Co-operative Investigations of the Caribbean and Adjacent Regions (now IOCARIBE)
CIESM	International Commission for the Scientific Exploration of the Mediterranean Sea
CIM	Co-operative Investigations in the Mediterranean
IDOE	International Decade of Ocean Exploration
IGY	International Geophysical Year
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Association for the Caribbean and Adjacent Regions
TEMA	IOC Working Committee for Training, Education, and Mutual Assistance

Source: See Alexander, *Regional Arrangements In The Oceans*, 71 AM. J. INT'L L. 84, 101 (1977).

APPENDIX III

**Countries who are Signatories to Bilateral Agreements under the
Fishery Conservation and Management Act of 1976: Agreements
Concerning Fisheries off the Coasts of the United States (GIFA's)***

1. GIFA, U.S.-Bulgaria, Dec. 17, 1976, [1976-77] 4 U.S.T. 3955, T.I.A.S. No. 9045.
2. GIFA, U.S.-Denmark, Sept. 5, 1979, [1979] 6 U.S.T. 4859, T.I.A.S. No. 9649 (effective Jan. 18, 1980).
3. GIFA, U.S.-European Economic Community, Feb. 15, 1977, [1976-77] 4 U.S.T. 3787, T.I.A.S. No. 8598 (effective June 9, 1977).
4. GIFA, U.S.-German Democratic Republic, Oct. 5, 1976, [1976-77] 2 U.S.T. 1793, T.I.A.S. No. 8527 (effective Mar. 4, 1977).
5. GIFA, U.S.-Japan, Sept. 10, 1982, T.I.A.S. No. 10480 (effective Jan. 1, 1983).
6. GIFA, U.S.-Korea, Jan. 4, 1977, [1976-77] 2 U.S.T. 1753, T.I.A.S. No. 8526 (effective Mar. 3, 1977).
7. GIFA, U.S.-Norway, Jan. 26, 1981, T.I.A.S. No. 10077 (effective May 15, 1981).
8. GIFA, U.S.-Poland, Aug. 2, 1976, [1976-77] 2 U.S.T. 1681, T.I.A.S. No. 8524 (effective Feb. 28, 1977).
9. GIFA, U.S.-Portugal, Oct. 16, 1980, T.I.A.S. No. 9929 (effective Mar. 4, 1981).
10. GIFA, U.S.-Spain, July 29, 1982, (effective Jan. 17, 1983).
11. GIFA, U.S.-USSR, Nov. 26, 1976 [1976-77] 2 U.S.T. 1847, T.I.A.S. No. 8528 (effective Feb. 28, 1977).

*GIFA is the general abbreviation for a bilateral treaty negotiated under the FCMA and properly entitled an "Agreement Concerning Fisheries off the Coasts of the United States." The GIFA's initials derived from the popular general term for such an agreement; namely, a "Governing International Fishery Agreement." As of the date this chart was prepared, several U.S.T. cites were not yet available.

APPENDIX IV

Selected Major Agreements Related to Fisheries

A. *Multilateral Treaties to which the United States has Acceded as of 1983**

1. *Fisheries*

Convention on Fishings and Conservation of the Living Resources of the High Seas, *done* Apr. 29, 1958, [1966] 1 U.S.T. 138, T.I.A.S. No. 5969, 559 U.N.T.S. 285 (effective Mar. 20, 1966).

Amended Agreement for the Establishment of the Indo-Pacific Fisheries Council, *approved* Nov. 23, 1961, [1962] 2 U.S.T. 2511, T.I.A.S. No. 5218, 418 U.N.T.S. 348 (effective Nov. 23, 1961).

Convention for the Establishment of an Inter-American Tropical Tuna Commission, *signed* May 31, 1949, [1950] 1 U.S.T. 230, T.I.A.S. No. 2044, 80 U.N.T.S. 3 (effective Mar. 3, 1950).

International Convention for the High Seas Fisheries of the North Pacific Ocean, *signed* May 9, 1952, [1953] 1 U.S.T. 380, T.I.A.S. No. 2786, 205 U.N.T.S. 65 (effective June 12, 1953).

U.N. Special Fund Project on Caribbean Fishery Development, *signed* Apr. 6, 1966, [1968] 4 U.S.T. 4938, T.I.A.S. No. 6501 (effective Apr. 6, 1966).

Convention for the Conservation of Atlantic Tunas, *done* May 14, 1966, [1969] 3 U.S.T. 2887, T.I.A.S. No. 6767, 673 U.N.T.S. 63 (effective Mar. 21, 1969).

2. *South Pacific Commission*

Agreement Establishing the South Pacific Commission, *signed* Feb. 6, 1947, [1951] 2 U.S.T. 1787, T.I.A.S. No. 2317, 97 U.N.T.S. 227 (effective July 29, 1948).

3. *Whaling*

Convention for the Regulation of Whaling, *concluded* Sept. 24, 1931, 49 Stat. 3079, T.S. No. 880, 3 Bevans 26, 155 U.N.T.S. 349 (effective Jan 16, 1935).

Convention for the Regulation of Whaling with Schedule of Whaling Regulations, *signed* Dec. 2, 1946, 62 Stat. 1716, T.I.A.S. No. 1849, 4 Bevans 248, 161 U.N.T.S. 72 (effective Nov. 10, 1948).

Protocol to the International Convention for the Regulation of Whaling Signed Under Date of Dec. 2, 1946, *done* Nov. 19, 1956, [1959] 1 U.S.T. 952, T.I.A.S. No. 4228, 338 U.N.T.S. 336 (effective May 4, 1959).

B. *Multilateral Treaties Not Involving the United States*

1952 Convention for the High Seas Fisheries of the North Pacific Ocean, 205 U.N.T.S. 65.

London Fisheries Convention, Mar. 9, 1964, 581 U.N.T.S. 57, *reprinted in* U.N. Doc. ST/LEG.SER.B/15, at 862 (1970).

Draft Convention on Wetlands of International Importance Especially as Water-front Habitat, *done* Feb. 3, 1971, *reprinted in* 11 I.L.M. 969 (1972).

*Those cites without U.N.T.S. references are caused by the slowness of the U.N. system in printing the U.N.T.S.