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THE MARINE MAMMAL PROTECTION ACT AND THE FISHERY CONSERVATION AND MANAGEMENT ACT: THE NEED FOR BALANCE*

Terrin Child** and Jeffrey T. Haley***

I. INTRODUCTION

Since 1972 Congress has enacted several statutes extending federal control over marine resources. This body of legislation differs greatly in both extent and approach from pre-existing resource regulatory schemes. This article will discuss two of these statutes in depth.¹ The Fishery Conservation and Management Act of 1976² (FCMA) extends federal juris-

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1. Three acts not analyzed in this article are: Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1543 (1976) (while not exclusively legislation for marine resources, this Act protects marine fauna and flora and exceeds all previous legislation in its breadth and potential effectiveness); Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451-1464 (1976) (provides guidelines, incentives, and funding for coastal states to develop broad integrated programs of coastal zone use); Marine Sanctuaries Act, 16 U.S.C. §§ 1431-1434 (1976) (provides for regulation and monitoring of the use of certain parts of the marine environment valued for their uniqueness, beauty, and historical significance in order to preserve those characteristics).

2. 16 U.S.C. §§ 1801-1882 (1976). The FCMA was passed at the time of the United Nations debate over the advisability of a 200-mile exclusive economic zone. Before the conclusion of that debate, many coastal states unilaterally extended national jurisdiction seaward. The FCMA itself goes far beyond a declaration of 200-mile jurisdiction. One portion of the Act is a blueprint for allocation of fishery resources to foreign nations with an interest in, or history of harvest in, what became United States waters because of the seaward extension of jurisdiction in 1976. The balance of the Act describes domestic policy for management of fishery resources and establishes an administrative framework through which this policy is to be implemented. The National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce is the lead agency for administration of the Act. Within NOAA, the National Marine Fisheries Service (NMFS) acts as the federal regulatory body. The FCMA creates eight regional fishery management councils. The latter are quasi-governmental bodies which bring together people from government, industry, academia, and the public in an attempt to develop responsive fisheries management policies and plans for each fishery in their respective jurisdictions. The Councils are thus the primary regulatory bodies, although NMFS, of course, has the power of legal promulgation of the plans and regulations.

diction over fishery resources³ seaward to 200 miles and beyond.⁴ The Marine Mammal Protection Act of 1972⁵ (MMPA), as amended by the FCMA, places all marine mammals⁶ under federal control and erects a tight protective regulatory scheme around them.

The two acts share certain characteristics. Both treat resources which are components of the same ecosystem. Both extend federal control over resources previously either managed by the states or unprotected. And both promote nonscientific values, such as cultural, sociological, historic, and aesthetic values, which are not easily quantified.

It is the extent of difference between the two acts, however, which is their most noteworthy and troublesome characteristic. The acts were passed separately over a period of years, by different Congresses, in response to pressures from different interest groups. They reflect disparate influences in their purposes and goals, some of which verge on mutual exclusivity.⁷ These differences can create serious conflicts between the

3. Fishery resources include all "fish" as defined in the FCMA: "finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals, birds, and highly migratory species." 16 U.S.C. § 1802(6) (1976). The FCMA defines "highly migratory species," which it excludes from its jurisdiction, to include only tuna. 16 U.S.C. § 1802(14) (1976). Most congressional discussions for fishery management within the extended jurisdiction contemplated the inclusion of marine mammals, but the House version which was finally accepted excluded them. The legislative history does not offer an explanation for the change. It has been suggested that Congress, anticipating possible conflict between the management standards of the FCMA and the Marine Mammal Protection Act (MMPA), 16 U.S.C. §§ 1361-1407 (1976), intended to defer allocation of the primary management jurisdiction over marine mammals to the MMPA. Nafziger, *The Management of Marine Mammals after the Fishery Conservation and Management Act*, 14 WILLAMETTE L.J. 153, 178-81 (1978). James P. Walsh, then Staff Counsel for the Senate Committee on Commerce, is said to have reported in a telephone conversation with Nafziger on January 6, 1977 that the decision to exclude marine mammals from the definition of fish was made by the Senate-House Conference Committee as a matter of staff development in response to fears expressed by environmentalists. *Id.* at 158.

4. The United States also claims jurisdiction to the limit of the continental shelf and over anadromous species. 16 U.S.C. § 1812 (1976).

5. 16 U.S.C. §§ 1361-1407 (1976). The MMPA was passed in response to a wave of environmental emotion against the incidental catch of porpoise in tuna fishing, continued global whaling, the Canadian harvest of harp seals, and the Pribilof Islands fur seal management program in which the United States participates. The MMPA divides jurisdiction over marine mammals between the Departments of Commerce and the Interior. The Secretary of Commerce has responsibility for cetacea and pinnipedia, with the exception of walrus. The Secretary of Commerce has jurisdiction over all other marine mammals. 16 U.S.C. § 1362(12) (1976). These two Secretaries delegate their respective responsibilities to the National Marine Fisheries Service and the Fish and Wildlife Service. The Secretaries are aided by the Marine Mammal Commission, a body created by the MMPA to advise other bodies and influence implementation of that Act.

6. In the MMPA, "marine mammal" is defined as "any mammal which (A) is morphologically adapted to the marine environment (including sea otters and members of the orders Sirenia, Pinnipedia and Cetacea), or (B) primarily inhabits the marine environment (such as the polar bear)." 16 U.S.C. § 1362(5) (1976).

7. The conflicting purposes of the FCMA and the MMPA present a paradigm of the protection/productive-use dichotomy common to many areas of resource management, forcing considera-

acts' respective resource management goals inasmuch as the organisms affected by the acts are biologically interdependent.⁸

The primary purpose of the FCMA is to realize the maximum sustainable productivity from fishery resources, while the primary purpose of the MMPA is to protect one group of marine organisms from harvest as a resource and from the incidental harmful effects of other resource predation. The inconsistencies between the management directives based on the differing purposes of these two acts jeopardize rational ecosystem management.⁹

This article presents an analysis of those provisions of the MMPA which may impede the achievement of FCMA objectives. It is important that these possible conflicts be resolved because while the United States controls off the coast of Alaska what may be the world's largest resources

tion of a basic policy question of allocation of marine resources: at what levels of marine mammal and human demand for additional food will we decide that more marine resources should be used for human needs and fewer marine resources used to support marine mammals? See Nat'l Oceanic and Atmospheric Admin., Nat'l Marine Fisheries Service, U.S. Dep't of Commerce & Fish and Wildlife Service, U.S. Dep't of Interior, Environmental Impact Statement: Consideration of a Waiver of the Moratorium and Return of Management of Certain Marine Mammals to the State of Alaska (March 1978).

8. Fish and other marine organisms interact continuously in the marine environment. It is nearly impossible for any species to be affected in any way without other species also being affected. This species interdependence is the most important characteristic of the functioning marine ecosystem. The co-occurrence of fish and marine mammals within this ecosystem manifests itself primarily in two behavioral interactions. Species may interact as predator and prey, or species may compete against each other for a third food resource. Botkin & Sobel, *Optimum Sustainable Marine Mammal Populations 48* (March 31, 1977) (a report prepared for the Marine Mammal Commission) [hereinafter cited by its popular title, MMC OSP Report].

9. See *Marine Mammal Protection Authority: Hearing on H.R. 10730 and H.R. 10731 Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 95th Cong., 2d Sess. 196 (1978) (statement of Rep. Les Aucoin) ("Some industry people—and some scientists from Oregon . . . claim that some marine mammals are being protected at the expense of other species in the ecosystem."); *Oversight of the FCMA: Hearings on S. 3050 Before the Senate Comm. on Commerce, Science, and Transportation*, 95th Cong., 2d Sess. 211–12 (1978) (statement of John Harville, Executive Director, Pacific Marine Fisheries Comm'n) ("The Pacific Marine Fisheries Commission over a four-year period has called for reexamination of the Marine Mammal Protection Act to bring it in line with the FCMA. We feel it simply is not rational to try to manage our ocean resources on an ecosystem concept but have the top predators immune from the management. Here in the Pacific Northwest we are facing very severe penalties because the pinnipeds—sea lions and seals—are immune from any sort of management and are getting bolder and more numerous and thereby creating a major problem.") *Oversight of the Marine Mammals Protection Act of 1972: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 93d Cong., 1st Sess. 90 (1973–1974) (statement of Robert Rausch, Deputy Director for Div. of Game, Alaska Dep't of Fish and Game) ("[I]t seems . . . that the thrust of the [Marine Mammal Protection Act] in part addresses itself to the . . . integrity of the ecosystem. . . . [T]here are millions of metric tons of fish being taken in the North Pacific and Bering Sea—and here we come on and say that we're going to allow a total protection essentially, of this fairly major user of fish. . . . [S]ome provisions . . . have to be made very shortly to harvest sea lions and seals in the area of commercial fisheries or we are going to get into a very, very difficult problem.").

of fish,¹⁰ these same waters contain enormous numbers of marine mammals.¹¹ These fishery resources, if managed rationally, can make a large contribution to the economy of the United States and to the protein needs of the world. A reasonable accommodation between the MMPA and the FCMA must be found in order to achieve that possibility.

A. *The Conflicting Purposes of the Fishery Conservation and Management Act and the Marine Mammal Protection Act*

A central purpose of the FCMA is to encourage the commercial development of fisheries. Ample evidence of the commercial orientation of the legislation appears throughout the Act. The fishery resources contained within the 200-mile fishery conservation zone created by the FCMA represent wealth in several forms: food, employment, generation of capital and secondary industries, and recreation. This wealth potential was recognized and noted during the legislative hearings before passage of the Act. Although these hearings focused primarily on the international repercussions of extended jurisdiction and decimation of local fisheries, the commercial incentive for the FCMA was made clear: "We ought to make certain that one of the goals is to establish the capability to harvest these fish that comprise such an enormous potential for us in terms of food value and employment and income and reduce our current deficit and balance of payments in the fisheries areas."¹² Similarly, the utility of conservation measures was said to rest on the fact that they would "enable the overfished species to recover and become fully utilizable from a commercial point of view."¹³

The 200-mile fishery conservation zone is acknowledged several times in the FCMA as a source of food. Fish are described as "valuable and renewable natural resources" which "contribute to the food supply . . . and health of the Nation."¹⁴ Development of certain fisheries will allow United States citizens to benefit from the food supply which will be gen-

10. North Pacific Fishery Management Council, Fishery Management Plan and Final Environmental Impact Statement for Groundfish Fishery in the Bering Sea/Aleutian Island Area, 44 Fed. Reg. 66,367, 66,368 (1979). The optimum yield for pollock is set by the plan at one million metric tons. *Id.* at 66,439.

11. 95% of all marine mammals under United States jurisdiction inhabit the waters off the Alaska coast. Lecture by Professor Donald McKernan, Institute for Marine Studies, University of Washington (February 1979).

12. 122 CONG. REC. 458 (1976).

13. *Id.* at 441.

14. 16 U.S.C. § 1801(a)(1) (1976).

erated in the process.¹⁵ And, management of fisheries is to proceed with “particular reference to food production.”¹⁶

Commercial harvest of these fishery resources, of course, also entails employment and is referred to as “a major source of employment [which] contributes significantly to the economy of the Nation.”¹⁷ Similarly, development of new fisheries will generate additional employment.¹⁸

Commercial development of fishery resources will generate revenue and create secondary support industries, such as processing and marketing. The FCMA actively encourages this by calling “development of fisheries which are underutilized or not utilized by United States fishermen, including bottom fish off Alaska” necessary to ensure generation of revenue and employment.¹⁹

Finally, the FCMA acknowledges and supports the recreational value of 200-mile fishery conservation zone fishery resources. The recreational fishing and clamming industry generates a multimillion dollar income annually.²⁰

In contrast to the commercial orientation of the FCMA, the MMPA embodies a policy of protectionism with little and perhaps no room for commercial exploitation. Unlike that of the FCMA, the statutory language of the MMPA is not the strongest evidence of the orientation of the Act.²¹ The Act does suggest by its title that protectionism is a central value, but that, of course, is hardly determinative.

15. 16 U.S.C. § 1801(a)(7) (1976).

16. This language is taken from the FCMA definition of optimum yield (OY), the harvest goal for all managed fisheries: “the amount of fish—(A) which will provide the greatest overall benefit to the Nation, *with particular reference to food production* and recreational opportunities; and (B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor.” 16 U.S.C. § 1802(18) (1976) (emphasis added).

17. 16 U.S.C. § 1801(a)(3) (1976).

18. 16 U.S.C. § 1801(a)(7) (1976).

19. *Id.* The Carter administration made a policy commitment to provide for the accelerated development of the United States fisheries. Marine Fish Management, Dec. 1979, at 1–b. It is not known what attitude the Reagan administration will assume toward fisheries development. The failure of Senator Warren G. Magnuson’s (Democrat, Washington) 1980 bid for re-election may hinder such efforts. Senator Magnuson, the major force behind passage of the FCMA, was a strong proponent of development of domestic fisheries.

20. Lecture by Professor Donald McKernan, Institute for Marine Studies, University of Washington (Winter 1979).

21. The congressional findings in the Act recognize that “certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man’s activities.” 16 U.S.C. § 1361(1) (1976). This language establishes that a strong need for protection exists for certain marine mammals, but goes no further. The only explicit references to protection of marine mammals are in the Act’s statements of purpose: “the protection and conservation of marine mammals is therefore necessary to insure the continuing availability of those products which move in interstate commerce”; and “it is the sense of the Congress that [marine mammals] should be protected . . . to the greatest extent feasible commensurate with sound policies of resource management

The protectionist cast of the MMPA is evinced far more clearly by the substance and effects of the Act. The Act declares a moratorium on the take and importation of all marine mammals,²² certainly a protectionist stand, and leaves little room for countervailing considerations.

In *Committee for Humane Legislation, Inc. v. Richardson*,²³ a suit against the tuna industry and government agencies by citizen protectors of marine mammals seeking protection for porpoises under the MMPA, the defendants argued that Congress had intended that commercial as well as marine mammal interests be considered in implementation of the MMPA.²⁴ The federal district court disagreed, finding that "Congress enacted the MMPA for one basic purpose: to provide marine mammals, especially porpoise, with necessary and extensive protection against man's activities."²⁵ The court found further that:

The MMPA does not direct the defendants to afford porpoise only that amount of protection which is consistent with the maintenance of a healthy tuna industry. The interests of marine mammals come first under the statutory scheme, and the interests of the industry, important as they are, must be served only after protection of the animals is assured.²⁶

The court rejected the contention that the MMPA was intended as a "balancing act" between the interests of the mammals and those of the tuna industry.²⁷ The court relied on the congressional history of the MMPA to reach this result,²⁸ as well as what the court saw as the "plain meaning" of the Act.

. . . ." 16 U.S.C. § 1361(5)-(6) (1976). These statements seem to be simply standard interstate commerce clause boilerplate, designed to insure the constitutionality of the asserted federal jurisdiction.

22. 16 U.S.C. § 1371 (1976).

23. 414 F. Supp. 297 (D.D.C.), *aff'd*, 540 F.2d 1141 (D.C. Cir. 1976).

24. 414 F. Supp. at 306-12.

25. *Id.* at 306.

26. *Id.* at 309.

27. *Id.* at 307. On appeal, the federal court of appeals agreed with the district court that the MMPA "was to be administered for the benefit of the protected species rather than for the benefit of commercial exploitation." 540 F.2d at 1148. The court of appeals did note that "the Act was not intended to force tuna fishermen to cease operations." *Id.* However, the court of appeals ultimately found that the requirements of the MMPA were too clear to allow any result other than that reached by the district court. *Id.* at 1149.

28. 414 F. Supp. at 307. The court quoted H. R. REP. NO. 707, 92d, Cong., 1st Sess. 22 (1971): [M]arine mammals are resources of great significance and it is congressional policy that they should be protected and encouraged to develop consistent with sound policies of resource management. The primary objective of this management must be to maintain the health and stability of the marine ecosystem; this in turn indicates that the animals must be managed for their benefit and not for the benefit of commercial exploitation.
Id. at 307 n.24.

Balancing the MMPA and FCMA

The protectionist policy of the MMPA²⁹ is reflected in the actions of the National Marine Fisheries Service (NMFS). For example, in 1979, domestic and foreign fishing vessels under FCMA jurisdiction applied for permits to take a total of 12,262 marine mammals incidental to commercial fishing. Of these, the NMFS allowed a take of only 3,121.³⁰ Similarly, an administrative law judge recently found that twenty-five regulatory changes proposed by NMFS were “‘economically unfeasible’ to the tuna industry and ‘would hasten and encourage the movement of these U.S. vessels to foreign flag registry.’”³¹

The MMPA presents a serious obstacle to realization of FCMA goals because of its heavily protectionist orientation and its failure adequately to accommodate uses of the marine environment other than as a marine mammal habitat.³² This one-sidedness of the MMPA reflects the environmental activism of the early 1970’s.³³ The resulting legislation has the potential to hamper, and occasionally preclude, domestic fishery harvests by promoting the growth and maintenance of large marine mammal populations.

B. Sources of Conflict Between the MMPA and the FCMA

The technical basis for conflict between the MMPA and the FCMA is found in language of the FCMA. Under the FCMA, there must be a fishery management plan (FMP) for each fishery, prepared by the appropriate

29. It should be noted that Congress did not totally prohibit the taking and importation of marine mammals. This was not because Congress rejected the concept of protectionism, but because the House Committee on Merchant Marine and Fisheries

found itself unable to accept the thesis that a flat ban would inevitably operate to the benefit of the animals concerned. Experienced, independent scientists, not representing hunters, entrepreneurs or other interest groups, argued persuasively that animal populations may indeed require management in order to prevent them from exceeding the carrying capacity of their environment and thus destroying it and themselves in the process. “‘Nature’s way’” of regulating animal population is very often less humane than man’s way.

H.R. REP. NO. 707, 92d Cong., 1st Sess. 19 (1971). See S. REP. NO. 863, 92d Cong., 2d Sess., 5 (1972).

30. NAT’L OCEANIC AND ATMOSPHERIC ADMIN., U.S. DEP’T OF COMMERCE, CALENDAR YEAR 1979 REPORT ON THE IMPLEMENTATION OF THE FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976 27 (1980).

31. Marine Mammal News, July 1980, at 5.

32. The commercial-use orientation of one act, and the protectionist orientation of the other, have been called the key conflict with which government decision makers must deal. Personal communication with Dr. Donald Bevan, College of Fisheries, University of Washington (March 18, 1980). *Contra*, personal communication with Dr. William Aron, Nat’l Marine Fisheries Service (April 9, 1980). While recognizing the existence of a commercial-protectionist dichotomy, Dr. Aron said he could not see how this translated into a genuine operational conflict.

33. The MMPA was well received by Congress in 1972 when a positive response by environmental activists was politically expedient. A newly perceived “‘environmental backlash’” might prevent passage today.

fishery management council (FMC), or, occasionally, by the Secretary of Commerce.³⁴ Plans must describe the fishery³⁵ and the calculations used to set the harvest level.³⁶ In addition, all plans must “contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States which are . . . necessary and appropriate for the conservation and management of the fishery . . . [and] consistent with the national standards, the other provisions of [the FCMA], and any other applicable law.”³⁷ Similarly, implementing regulations cannot be promulgated unless the Secretary of Commerce “finds that the plan . . . is consistent with the national standards, the other provisions of [the FCMA], and any other applicable law.”³⁸

This requirement of consistency with “other applicable law” is the basis for constraint of fishing activities by other legislation. The legislative history of the FCMA does not indicate what scope the consistency provision was intended to have, and, in the absence of congressional direction to the contrary, it must be assumed that consistency requires compliance with all cognate provisions of the MMPA. Because the MMPA was in existence when the FCMA was passed, the MMPA cannot be considered to be excluded from the consistency provision. Also, the provision prevents argument that the FCMA impliedly repeals inconsistent provisions of the MMPA.

The principal study treating the issue of conflict between the FCMA and the MMPA concluded that the acts are compatible and, therefore, raise no issues of conflict in management.³⁹ While offering valuable comment and criticism on technical aspects of certain FMPs, the study takes a formalistic approach to the analysis of this legislation. The argument for compatibility rests on the observation that, under the FCMA, permissible

34. 16 U.S.C. § 1801(b)(4)-(5) (1976); 16 U.S.C. § 1852(h)(1) (1976); 16 U.S.C. § 1854(c) (1976). The Secretary of Commerce has the power to approve or disapprove the fishery management plans and preliminary fishery management plans which govern all harvest efforts in the fishery conservation zone (FCZ); to prepare, under certain circumstances, the actual plans, and to prepare all preliminary fishery management plans. 16 U.S.C. § 1821(g)-(h) (1976); 16 U.S.C. § 1854(a) (1976). The Secretary has broad prescriptive authority under the FCMA to carry out the preliminary fishery management plans and the fishery management plans. 16 U.S.C. § 1855(g) (1976).

35. Whether the description of the fishery should include fishing not subject to FCMA management is being litigated.

36. 16 U.S.C. § 1853 (1976). The Secretary of Commerce is also authorized to approve applications from foreign nations for permits to harvest within the FCZ and cooperate with the Secretary of State who allocates the resource to qualified nations. 16 U.S.C. § 1821(e) (1976).

37. 16 U.S.C. § 1853(a)(1)(A)-(C) (1976).

38. 16 U.S.C. § 1855(c)(2) (1976).

39. Hammond, *Fisheries Management Under the Fishery Conservation and Management Act, the Marine Mammal Protection Act, and the Endangered Species Act (1980)* (report funded and published by the Marine Mammal Commission) [hereinafter cited as Hammond]. The article by Nafziger, *supra* note 3, takes a similar approach and reaches the same conclusion.

harvest allows a departure from maximum sustainable yield for ecological reasons, among which is the maintenance of the optimum sustainable populations for marine mammals. While this conclusion is an accurate reading of the statutory language, it completely misses the point. The important question is not whether fishery harvests under the FCMA can be adjusted to accommodate the needs of marine mammals under the MMPA, for the answer to that clearly is yes. Instead, the important issues are: Will the FCMA objective of deriving the maximum benefits from living marine resources be jeopardized by the MMPA-required reduction in fishery harvests? Will the reduction cause a greater loss in food production and employment than is justified by the benefits of marine mammal protection? Which provisions of the MMPA might be construed to require such excessive reductions in fishery harvests? Can these provisions be construed otherwise? How can the two acts be amended to allow for balancing of their conflicting goals?

The source of conflict between the MMPA and achievement of FCMA objectives lies in two general deficiencies of the MMPA. First, the MMPA is a poorly drafted statute,⁴⁰ containing serious ambiguity in key terms. Many provisions of the MMPA threaten achievement of FCMA objectives because they can be construed very broadly as rigid constraints on marine resource management. Second, the MMPA contains no provision for balancing the conflicting objectives of the two statutory schemes.

II. THE CONFLICT IN DETAIL

A. *Resource Competition as a Mechanism of Conflict*

The primary thrust of the MMPA is to prohibit the taking and importation of marine mammals. This is accomplished by declaration of a “moratorium,”⁴¹ defined as “a complete cessation of the taking of marine mammals and a complete ban on the importation into the United States of

40. This is a widely-held opinion. See, e.g., *Preface to MMC OSP Report*, *supra* note 8 (The MMPA is ambiguous; it encourages contradictory biological interpretations of OSP); personal communication with Professor William T. Burke, School of Law, University of Washington (June 1979) (“The policy statements of the MMPA are subjective, pseudo-scientific jargon which are vague and redundant.”).

One serious problem with the poor draftsmanship is pointed out in Nafziger’s article on the MMPA:

Increasingly, there are examples of courts creating legal definitions of terms for which there is not universal agreement among biologists, to facilitate interpretation of laws using such language. It is possible the management of some species will become even more of a court function unless some agreement on terminology can be reached.

Nafziger, *supra* note 3, at 164.

41. 16 U.S.C. § 1371(a) (1976).

marine mammals and marine mammal products.’’⁴² Although there is no disagreement on what constitutes importation, that is not the case with the concept of taking. The MMPA defines “take” as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.’’⁴³ There is no requirement in the MMPA or its implementing regulations that the taking be intentional, and the legislative history of the Act indicates that Congress did not intend the concept to be so limited.⁴⁴

However, whether resource competition between fishermen and marine mammals is included in the meaning of “take” is unclear. Both fishermen and marine mammal protectionists view resource competition as a major problem. Fishermen are concerned that marine mammals are increasing in number as a result of MMPA protection, reducing the productivity and profitability of fishing operations.⁴⁵ On the other hand, protectionists view the push in the FCMA to develop the domestic fishing industries and achieve the optimum yield from the 200-mile fishery conservation zone as a serious threat to marine mammals and their habitat.

An increased marine mammal population causes problems for fishermen in three ways. Marine mammals consume fish from stocks presently used or of potential use to man for commercial harvest.⁴⁶ Marine mammals also consume fish nutrients, thereby indirectly decreasing fish available to fishermen. Furthermore, marine mammals prey upon catch, damaging both catch and gear in the process.⁴⁷

Conversely, fishermen compete with marine mammals for resources both by reducing the food available for the mammals and by degrading

42. 16 U.S.C. § 1362(7) (1976).

43. 16 U.S.C. § 1362(13) (1976).

44. H.R. REP. NO. 707, 92d Cong., 1st Sess. 23 (1971). See also 50 C.F.R. § 183 (1980).

45. See Nat’l Oceanic and Atmospheric Admin., Nat’l Marine Fisheries Service, U.S. Dep’t of Commerce & Fish and Wildlife Service, U.S. Dep’t of Interior, Environmental Impact Statement: Consideration of a Waiver of the Moratorium and Return of Management of Certain Marine Mammals to the State of Alaska (March 1978); Marine Mammal News, March 1976, at 4.

46. For example, this type of competitive interaction occurs among: Bering Sea pollock and northern fur seal; Bering Sea herring and northern fur seal, sea lion, and beluga whale; Bering Sea clam and walrus; Columbia River salmon and harbor seals; Alaska salmon and white whales; and California abalone and sea otters. 42 Fed. Reg. 38,982 (1977), reprinted in Nat’l Oceanic and Atmospheric Admin., Nat’l Marine Fisheries Service, U.S. Dep’t of Commerce, Administration of the Marine Mammal Protection Act of 1972 (June 1977).

Some scientists say it is not necessarily true that reduced marine mammal populations would result in more commercially harvested fish. For example, Columbia River fishermen complain bitterly that marine mammals eat their salmon. Dr. William Aron of NMFS points out that although marine mammals do eat the salmon three or four months out of the year, during the remainder of the year they eat other predators of salmon such as lampreys and bullheads. Personal communication with Dr. William Aron, Nat’l Marine Fisheries Service (April 9, 1980).

47. See Nafziger, *supra* note 3, at 189–90 (quoting *Mammals in the Sea: Ad Hoc Group IV—Ecological and General Problems* (Draft Report), U.N. Doc. ACMRR/MM/SC/5 at 8 (1976)). For example, in the North Pacific, Dall porpoises damage the catch and gear of gillnet fishermen, and sea

the environment. Some species of mammals are opportunistic feeders, and can switch to other sources of food if they are available. Many species, however, are not sufficiently adaptive. Unfortunately, there is currently little data to indicate which populations would be able to adapt. If a population is significantly reduced by lack of food, other changes may also occur, such as changes in reproduction rates or in sizes of individual animals. These changes may reduce the fitness of the population for its environmental niche,⁴⁸ causing additional population reduction.

The House Report issued before passage of the MMPA found degradation of the environment to be the most pervasive and threatening hazard to marine mammals.⁴⁹ The Marine Mammal Commission (MMC) claims that the destruction or degradation of marine mammal habitats can lead to the reduction or extinction of species or populations.⁵⁰ Fishing activities degrade the environment by disturbing pupping and breeding colonies, discarding debris, and reducing available marine mammal food, making the habitat incapable of supporting a species or stock.⁵¹ Other activities, such as oil development, ocean dumping, sewage disposal, and vessel waste disposal, may also seriously degrade the marine environment.

It is possible that any harvest of fish that detrimentally affects marine mammals as described could be found by a court to constitute a "taking" for purposes of the MMPA.⁵² Reduction of the food source and degradation of the habitat, after all, can be functionally equivalent to killing or harassing marine mammals by any other means. Also, the breadth of the purposes and policies of the MMPA suggests that all human actions which harm marine mammals should be covered by the Act.

It appears that members of Congress did not consider the problem of such trophic interactions within the ecosystem, even though the published

lions damage the catch of longliners. 42 Fed. Reg. 38,982 (1977), reprinted in Nat'l Oceanic and Atmospheric Admin., Nat'l Marine Fisheries Service, U.S. Dep't of Commerce, Administration of the Marine Mammal Protection Act of 1972 (June 1977). Gear interactions, especially those with nets, involve danger to marine mammals as well.

48. *Oversight of the Tuna-Porpoise Problem: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 94th Cong., 2d Sess. 337-38 (1976) (statement of Dr. William Y. Brown, formerly of the Council on Environmental Quality).

49. H.R. REP. NO. 707, 92d Cong., 1st Sess. 14 (1971).

50. See generally MARINE MAMMAL COMM'N, ANNUAL REPORT OF THE MARINE MAMMAL COMMISSION, CALENDAR YEAR 1976 64 (1977).

51. For the purposes of the Endangered Species Act, 16 U.S.C. §§ 1531-1543 (1976), habitat degradation may, in itself, be sufficient to warrant classification of a species as endangered. Nat'l Marine Fisheries Service, Biological Basis for Listing Species or Other Taxa of Salmonids Pursuant to the Endangered Species Act of 1973 (Dec. 8, 1978) (summary of workshop).

52. See Population Standards of the Marine Mammal Protection Act, Nat'l Oceanic and Atmospheric Admin. General Counsel Opinion 28 (Jan. 25, 1980) (by M. Bancroft) [hereinafter cited as NOAA General Counsel Opinion].

legislative hearings contain statements on the complexity of the relationships within the ecosystem,⁵³ and the House Committee Report noted that man's increased take of fish stocks upon which marine mammals depend posed a problem.⁵⁴ The legislative history indicates that Congress was concerned mainly with the incidental catch of porpoise in the tuna purse seine industry, commercial whaling, clubbing of Canadian seal pups, and controlled slaughter of adult bachelor fur seals. These problems are quite unlike resource competition between fishermen and marine mammals. They involve direct interference with the behavior of marine mammals, while food deprivation affects animals indirectly. And, unlike food deprivation, direct human interference—often violent and graphic—evokes an emotional reaction. That reaction was probably the principal motivation for passage of the MMPA. As discussed later in this article,⁵⁵ the standards set by the MMPA for allowable "take" of marine mammals, while responsive to the problem of direct human interference, cannot be applied in the area of resource competition.

The lack of attention paid by Congress to this problem, the dissimilarity between resource competition and the activities that Congress clearly sought to restrain, and the lack of appropriate standards in the area of resource competition, suggest that the MMPA should be construed to exclude indirect take by resource competition from the moratorium.

If the definition of "take" within the MMPA is construed to cover such competition, the effects on commercial fishing could be disastrous. Any fishing which might tend to reduce marine mammal populations could be prohibited under the moratorium. Because such a broad prohibition would be politically impossible to effect absent safeguards for the fishing industry, regulated resource competition would have to be permitted under the general waiver provision of the MMPA.⁵⁶ Even under the waiver provision, however, adverse effects on fishery interests could be severe because the MMPA requires any take to proceed under regulations which insure that the taking "will not be to the disadvantage of" a species or stock and will be "consistent with the Purposes and Policies of the MMPA," as discussed below.⁵⁷

53. *Oversight of the Tuna-Porpoise Problem: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 94th Cong., 2d Sess. 645, 337-38, 348 (1976); *Legislation for the Preservation and Protection of Marine Mammals: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation of the House Comm. on Merchant Marine and Fisheries*, 92d Cong., 1st Sess. 415 (1971) (statement of Dr. G. Carleton Ray).

54. H.R. REP. NO. 707, 92d Cong., 1st Sess. 14 (1971).

55. See part II B *infra*.

56. See note 69 and accompanying text *infra*.

57. See part II B *infra*.

Balancing the MMPA and FCMA

If the MMPA is construed not to include indirect take, in the form of resource competition or degradation of habitat, many FCMA management decisions will be made which will not require a permit and conformance with regulations under the MMPA. MMPA requirements that regulations insure that any take “will not be to the disadvantage of” a species or stock and will be “consistent with the Purposes and Policies of the MMPA” would thus not apply. However, the FCMA requires that all Fishery Management Plans and their implementing regulations be consistent with “other applicable law.” It is unclear whether the “other applicable law” requirement invokes by itself the purposes and policies of the MMPA. If so, then resource competition, even if not within the definition of “take” under the MMPA, will be constrained by the MMPA and still subject to the problems created by poor drafting of its purposes and policies.

Notice of resource competition taken by the North Pacific Fishery Management Council (NPFMC) in its FMP for the groundfish fishery of the Bering Sea and Aleutian Islands⁵⁸ suggests that this is the Marine Mammal Commission’s interpretation of the “other applicable law” provision⁵⁹ and that this will be the approach of the NPFMC. According to the FMP, “[t]he most pronounced biological characteristic of the Bering Sea and Aleutian Islands . . . is the presence of large numbers of marine mammals (e.g. 1.4 million fur seals alone) and birds . . . which consume together at least as many fish as the commercial catch of all nations from this region.”⁶⁰

The FMP notes the “other applicable law” requirement of the FCMA,

58. North Pacific Fishery Management Council, Fishery Management Plan and Final Environmental Impact Statement for Groundfish Fishery in the Bering Sea/Aleutian Island Area, 44 Fed. Reg. 66,367 (1979).

59. The MMC monitors all FMPs for evidence that they adequately address the needs of marine mammals, and criticized earlier versions of the Bering Sea/Aleutian Islands groundfish FMP. Comments made by John Twiss, Executive Director of the MMC, to James Branson, Executive Director of the NPFMC, on the FMP and Draft Environmental Impact Statement, indicate that the MMC gives FMPs close and demanding readings. In these comments, the MMC implicitly subordinates fishery management to marine mammal protection, calling for adjustment of optimum yield levels (1) to account for fishery-induced changes in the abundance and distribution of one species which affect the abundance and distribution of other species, and (2) to achieve the goal of maintaining marine mammals at optimum sustainable populations. Twiss stresses the need for a conservative ecosystem-oriented approach. Letter from John Twiss of the Marine Mammal Commission to James Branson of the North Pacific Fishery Management Council on the Draft Fishery Management Plan for the Groundfish Fishery in the Bering Sea and Aleutian Islands Area (Jan. 18, 1979).

60. North Pacific Fishery Management Council, Fishery Management Plan and Final Environmental Impact Statement for Groundfish Fishery in the Bering Sea/Aleutian Island Area, 44 Fed. Reg. 66,367, 66,415 (1979). According to a 1976 NMFS estimate, marine mammals removed 20% of the 58 million metric tons of groundfish annually removed from the area, while commercial fishermen removed only 14%. The remainder fell prey to other fish or to disease. Marine Fish Management, March 1976, at 4.

cites two MMPA goals—maintenance of health and stability of the marine ecosystem and optimum sustainable population—and asserts cognizance of the needs of the marine mammal populations “pursuant to provisions of both Acts.”⁶¹ To account for marine mammal food needs, the NPFMC considered predation by mammals on fish stocks as part of natural fish mortality in computing stock assessments, from which yield and catch figures are derived. This allegedly indirectly takes into consideration the volume of fish needed by marine mammals for their sustenance. The FMP expressed the opinion of the NPFMC that the plan “should reduce competition with marine mammals for fish when compared to the past decade. The proposed total groundfish optimum yield is about 25% below the average catch of 1969–1976, thereby leaving more fish for marine mammal consumption.”⁶² This statement allegedly sufficed for consideration of the volume of fish needed by marine mammals for their sustenance.⁶³

The NPFMC has thus apparently determined that FMPs must be consistent with the policies of marine mammal protection under the MMPA. Having conceded that consistency requires adjustment of fishing which competes for resources with marine mammals, however, the NPFMC has left itself open to criticism for not having considered marine mammal needs sufficiently or not having fully met the appropriate standard under MMPA policies.

Whether the NPFMC in its Bering Sea and Aleutian Islands groundfish FMP intended to make a concession with such legal implications is unknown. A concession was made, however, and it calls into question the adequacy of other FMPs which affect marine mammals. At least two other FMPs manifestly fall short of the accommodation made in the Bering Sea and Aleutian Islands groundfish FMP.⁶⁴

61. North Pacific Fishery Management Council, Fishery Management Plan and Final Environmental Impact Statement for the Bering Sea/Aleutian Island Area, 44 Fed. Reg. 66,367, 66,421 (1979).

62. *Id.* at 66,422.

63. *Id.* at 66,421.

64. The North Pacific Fishery Management Council merely offers some description of marine mammal-fish competition:

The ecological relationships of principal concern to salmon off Alaska are embedded in food chain relationships: i.e., marine mammals (sea lions) which eat salmon which eat herring (or krill or needlefish) which eat plankton which need nutrient energy, etc. . . . The sea lion population has increased substantially since [the MMPA] moratorium went into effect. Sea lions prey on salmon and this has an effect on salmon stocks.

North Pacific Fishery Management Council, Fishery Management Plan for the High Seas Salmon; Fishery off the Coast of Alaska, 44 Fed. Reg. 33,250, 33,261 (1979). There is no evidence that sea lion needs are considered in the FMP's optimum yield consumptions.

A draft FMP of the Pacific Fishery Management Council mentions that Pacific whiting may be an important food item for northern fur seals, and that shortbelly rockfish consume euphasiids, a shrimp-

B. Conditions on Issuance of Permits to Affect Marine Mammals

Five categories of activities are excluded from the operation of the MMPA moratorium on all take and importation of marine mammals. A two-year exemption, since lapsed, was allowed for persons other than commercial fishermen in order to minimize undue economic hardship.⁶⁵ An exemption still exists for the “taking of any marine mammal by any Indian, Aleut, or Eskimo who dwells on the Coast of the North Pacific Ocean or the Arctic Ocean if such taking . . . is for subsistence purposes.”⁶⁶ There are two exceptions for which permits are required: “taking and importation for purposes of scientific research and for public display,”⁶⁷ and taking of marine mammals incidental to commercial fishing.⁶⁸ Finally, the moratorium may be waived.⁶⁹ Of the five categories, the last two are important to fishermen.

If fishermen want to take marine mammals as incidental catch or want a waiver of the moratorium in order to affect marine mammals by direct take or otherwise, they must obtain a permit. Permits⁷⁰ may be granted only under promulgated regulations.⁷¹ The taking must meet three requirements.

First, the regulations must insure that the taking will not be to the disadvantage of a species or stock.⁷²

Second, the taking must be consistent with the purposes and policies of the MMPA.⁷³ The purposes and policies section of the Act in turn im-

like food source for marine mammals. The Draft FMP then concludes “there is no reason to believe that implementation of any of the alternative measures proposed in this plan will have a significant adverse impact on the marine ecosystem as a whole.” Pacific Fishery Management Council, Fishery Management Plan and Environmental Impact Statement for the California, Oregon and Washington Groundfish Fishery 102 (Nov. 1979) (a draft report funded by NOAA and NMFS). The MMPA is disposed of in one sentence to the effect that it establishes a moratorium. *Id.* at 61. The 1980 draft FMP expands reference to the MMPA to note that a few domestic fishermen in the Council area may affect marine mammals and therefore these operations are subject to the MMPA, that marine mammal takings are not authorized by foreign fishing permits and also need a certificate of inclusion, and to cite a report of a workshop on marine mammal/fishery interaction. Pacific Fishery Management Council, Draft Fishery Management Plan and Supplemental Environmental Impact Statement for the Washington, Oregon, and California Groundfish Fishery 4-16 (Dec. 17, 1980) (revision of 1979 draft). The 1980 draft reaches the same conclusion as the 1979 draft regarding adverse impact on the ecosystem as a whole.

65. 16 U.S.C. § 1371(a)(2) (1976).

66. 16 U.S.C. § 1371(b)(1) (1976).

67. 16 U.S.C. § 1371(a)(1) (1976).

68. 16 U.S.C. § 1371(a)(2) (1976).

69. 16 U.S.C. § 1371(a)(3)(A) (1976).

70. 16 U.S.C. § 1374(b)(1) (1976).

71. 16 U.S.C. § 1371(a)(3)(A) (1976).

72. 16 U.S.C. § 1373(a) (1976).

73. 16 U.S.C. § 1373(a)(1)(B) (1976). This requirement, with respect to waiver, is redundant since the MMPA elsewhere provides that taking under a waiver must be “in accord with sound principles of resource protection and conservation as provided in the purposes and policies of [the MMPA].” 16 U.S.C. § 1371(a)(3)(A) (1976).

poses other requirements. Purposes and policies of significance to fishery management are:

1. species and population stocks of marine mammals should be *significant functioning elements* in their ecosystems;⁷⁴
2. species and population stocks of marine mammals should not diminish below their *optimum sustainable population*, the *optimum carrying capacity* of the habitat being kept in mind;⁷⁵
3. efforts should be made to protect the rookeries, mating grounds, and *areas of similar significance* for marine mammal species and population stocks;⁷⁶
4. the primary objective of marine mammal management should be to maintain *the health and stability of the marine ecosystem*.⁷⁷

The optimum carrying capacity language is also contained within the statutory definition of “*conservation and management*” as the “collection and application of biological information for the purposes of increasing and maintaining the number of animals within species and populations of marine mammals at the optimum carrying capacity of their habitat.”⁷⁸ Conservation and management efforts are further defined to include *habitat acquisition and improvement*.⁷⁹

Third, in addition to the requirements described, the MMPA provides that five factors must be considered in prescribing regulations,⁸⁰ none of which appears to raise important issues of construction.

The requirements that the taking not be to the disadvantage of the marine mammals and that the taking be consistent with the purposes and policies of the MMPA do raise important issues of statutory construction, and will be analyzed in some detail in what follows.

1. “*will not be to the disadvantage of*”

The MMPA requires that any regulations which authorize a taking under an incidental catch or waiver exception not “disadvantage” any

74. 16 U.S.C. § 1361(2) (1976).

75. 16 U.S.C. § 1361(6) (1976).

76. 16 U.S.C. § 1361(2) (1976).

77. 16 U.S.C. § 1361(6) (1976).

78. 16 U.S.C. § 1362(2) (1976).

79. *Id.*

80. (1) existing and future levels of marine mammal species and population stocks;

(2) existing international treaty and agreement obligations of the United States;

(3) the marine ecosystem and related environmental considerations;

(4) the conservation, development, and utilization of fishery resources; and

(5) the economic and technological feasibility of implementation.

16 U.S.C. § 1373(b) (1976). The Act directs the Secretary to consider all relevant factors, including but not limited to the five listed here. *Id.*

marine mammal species or population stock.⁸¹ In drafting regulations for incidental catch permits, the Secretary of Commerce sets a quota on incidental catch figures.⁸² The larger the quota, of course, the more fishing can occur. The paramount concern of the secretary under the MMPA, however, must be that the taking not “disadvantage” the mammals in question, no matter how serious an effect there might be on the fishery. Unfortunately, the MMPA does not describe what constitutes a “disadvantage” to marine mammals. The possibility is thus left open for a very expansive interpretation which could greatly curtail fishing activities. A court or the Secretary could prevent that possibility by equating “disadvantage” with the standard of “threatened” under the Endangered Species Act.⁸³ Such a construction would make the “disadvantage” language a less restrictive, but not unreasonable, limitation on allowable incidental catch. Because of the uncertainties of this administration approach, however, Congressional amendment, making clear the intended meaning of “disadvantage,” seems preferable.

2. “consistent with the purposes and policies of” the MMPA

The MMPA establishes a consistency standard which must be met in two situations. First, the Secretary of Commerce “shall prescribe such regulations with respect to the taking and importing of [marine mammals] as he deems necessary and appropriate to insure that such taking . . . will be consistent with the purposes and policies set forth in [the MMPA].”⁸⁴ Second, the applicant for a permit which authorizes the taking or importation of any marine mammal “must demonstrate to the Secretary that the taking or importation of any marine mammal under such permit will be consistent with the purposes of [the MMPA] and the . . . regulations established under [it].”⁸⁵ This consistency standard is also applicable in a third situation. When the Secretary determines that the moratorium can or should be waived, he “must be assured that the taking of such marine mammal is in accord with sound principles of resource protection and conservation as provided in the purposes and policies of [the MMPA].”⁸⁶ In addition, the consistency provision of the FCMA may require that FMPs which authorize resource competition with marine mammals also be consistent with the purposes and policies of the MMPA.⁸⁷

81. 16 U.S.C. § 1373(a) (1976).

82. 16 U.S.C. § 1373(c)(1) (1976).

83. The Endangered Species Act is found in 16 U.S.C. §§ 1531–1543 (1976). See notes 120–23 and accompanying text *infra*.

84. 16 U.S.C. § 1373(a) (1976).

85. 16 U.S.C. § 1374(d)(3) (1976).

86. 16 U.S.C. § 1371(a)(3)(A) (1976).

87. See notes 56–64 and accompanying text *supra*.

That Congress intended this consistency requirement to have a bite is clear. Congressman Dingell, Chairman of the House Committee on Merchant Marine and Fisheries, commented:

Before issuing any permit for the taking of a marine mammal, the Secretary must first have it proven to his satisfaction that any taking is consistent with the purposes and policies of the act—that is to say, that taking will not be to the disadvantage of the animals concerned. If he cannot make that finding, he cannot issue a permit. It is that simple.⁸⁸

Similarly, the House Report, commenting on the requirement that the permit applicant show that a proposed taking be consistent with the purposes and policies of the MMPA, noted:

If that burden is not carried—and it is by no means a light burden—the permit may not be issued. The effect of this set of requirements is to insist that the management of the animal populations be carried out with the interests of the animals as the prime consideration.⁸⁹

Two courts have taken the same approach to the consistency requirement.⁹⁰

The consistency requirement may have serious implications for fisheries management under the FCMA because the purposes and policies of the MMPA are ambiguous and in some cases very rigid. Consensus has not been reached on the implications and intended meaning of most of the purposes and policies. Litigation and great governmental expense will be necessary to resolve the questions of interpretation, and the result might seriously restrict fisheries development. The following purposes and policies are significant for their potential for conflict with the FCMA and demand detailed analysis.

a. Purposes and Policies: “significant functioning element”

Congress found that “certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man’s activities”⁹¹ and that “such species and population stocks should not be permitted to diminish beyond the point at which they cease

88. 118 CONG. REC. 7686 (1972) (floor remarks).

89. H.R. REP. NO. 707, 92d Cong., 1st Sess. 18 (1971).

90. Committee for Humane Legislation, Inc. v. Richardson, 414 F. Supp. 297 (D.D.C.), *aff’d*, 540 F.2d 1141 (D.C. Cir. 1976). Both courts stated that permits could not be issued without a showing that the proposed taking would meet the consistency requirement. 414 F. Supp. at 312; 540 F.2d at 1150. The opinions were most concerned with procedural omissions in the permit application process and promulgation of regulations. There is no discussion by either court of what must be demonstrated to show that the consistency requirements have been met.

91. 16 U.S.C. § 1361(1) (1976).

to be a significant functioning element in the ecosystem of which they are a part.”⁹² The MMPA declares the latter to be a “major objective” of the legislation.⁹³ The Act does not, however, provide criteria by which to determine if a species or population stock is such a “significant functioning element.” Nor have any agency or judicial interpretations appeared. The concept is not one about which any scientific consensus exists, and it consequently remains open to interpretations which have the potential to affect fisheries management adversely.

A report funded by the Marine Mammal Commission suggests defining a population as a “functioning element” in an ecosystem if reduction of its population results in some significant change in characteristics of the ecosystem other than its own population size.⁹⁴ An ecosystem can be described in terms of three basic functional characteristics: cycling of chemical elements, flow of energy, and dynamics of population.⁹⁵

Cycling of chemical elements appears to be the key to the significant role marine mammals play in the marine ecosystem. The availability of crucial nutrients in the photic zone limits the rate of phytoplankton photosynthesis. Marine phytoplankton tend to sink, removing the nutrients they contain from the photic zone. In order for primary production in the zone to be sustained, these nutrients must be returned. Some marine mammals, such as sperm and baleen whales, porpoises, and seals, feed below the photic zone, but spend a significant portion of their time at the surface, bringing up nutrient ions and excreting them in the photic zone. This chemical recycling by marine mammals of major limiting nutrients could have local effects capable of greatly altering stocks of other marine organisms.⁹⁶ The recycling makes the photic zone able to support fish which in turn support many marine mammals. Arguably, for certain fish species, a decrease in marine mammals may mean less productivity for fish species and population stocks. This in turn may make marine mammals even less productive, contributing to the downward spiral of the total marine biomass. Since marine mammals can and do observably affect the cycling of chemical elements in the ecosystem, they can be said to be functioning elements in their ecosystems.⁹⁷

In some situations, it may be necessary to protect or increase marine mammal populations in order to meet the major policy objective of the MMPA that these animals be “significant functioning elements” in the

92. 16 U.S.C. § 1361(2) (1976).

93. *Id.*

94. MMC OSP Report, *supra* note 8, at 31–42.

95. *Id.* at 44.

96. *Id.* at 63–66.

97. *Id.* at 78.

marine ecosystem. The objective, therefore, can serve as legal justification for curtailing fishing activities which tend to reduce marine mammal populations. Nevertheless, evaluating marine mammal species or population stocks in terms of the manner in and degree to which they contribute to the functioning of the ecosystem does not necessarily present the potential for conflict with fisheries interests and activities. The qualifier "significant" could be interpreted to mean that small or highly speculative effects of marine functions would be ignored in evaluating the consistency of a regulation or permit issuance with the MMPA. However, nothing in the legislation or regulations indicates that any such limiting effect was contemplated for the word "significant."

b. Purposes and Policies: "optimum carrying capacity"

The MMPA introduces and defines the concept of "optimum carrying capacity" (OCC) as "the ability of a given habitat to support the optimum sustainable population of a species or population stock in a healthy state without diminishing the ability of the habitat to continue that function."⁹⁸ The OCC concept is a variant of "carrying capacity," a term with an accepted scientific meaning. Carrying capacity is the maximum number of animals of a given species that a habitat can support at one time.⁹⁹ When a population has reached the carrying capacity of a habitat, it is consuming all available food and is typically in less than good health due to overcrowding and occasional undernourishment. OCC is, therefore, less than the carrying capacity to the extent required to maintain good health and a high rate of reproduction of food sources for the marine mammals.

OCC serves three functions under the MMPA. First, it qualifies the secondary objective of the legislation: whenever consistent with maintaining the health and stability of the marine ecosystem, "it should be the goal to obtain an optimum sustainable population keeping in mind the optimum carrying capacity of the habitat."¹⁰⁰ Second, the Secretary of Commerce and the Secretary of the Interior are directed to use OCC in determining whether a species or population stock is "depleted" by noting if the number of individual animals "is below the optimum carrying capacity for the species or [population] stock within its environment."¹⁰¹ Third, OCC is part of the definition of optimum sustainable population.

98. 16 U.S.C. § 1362(8) (1976).

99. COUNCIL ON ENVIRONMENTAL QUALITY, WILDLIFE AND AMERICA 341 (Brokaw ed. 1978).

100. 16 U.S.C. § 1361(6) (1976).

101. 16 U.S.C. § 1362(1)(C) (1976). There is a serious inconsistency between the meaning of OCC within the definition of "depleted" and the regulation which defines optimum sustainable popu-

Balancing the MMPA and FCMA

As is true for other MMPA management terms, some controversy attends the concept of OCC.¹⁰² Although there may be agreement on the theoretical meaning of the term, no agreement on a working definition has been reached.¹⁰³

A major unresolved issue which might give rise to conflicts with fishing activities under the FCMA is the temporal nature of OCC: for what point in time should the carrying capacity be measured to establish OCC?¹⁰⁴ The temporal issue has three possible answers. First, carrying capacity could be a historic, preexploitation figure. Second, carrying capacity could be a static figure set either for all species at some arbitrary contemporary date, like 1972 when the MMPA was passed, or species-by-species at the time that NMFS first measured each population. Third, carrying capacity could be a dynamic figure, changing over time to reflect the changing condition of the habitat.

Each interpretation could have a different and substantial impact on fishing activities. For example, the carrying capacity of the fur seal environment in Alaska is substantially lower today than it was in the 1700's, 1950's, or 1960's simply because trawl fleets are now removing two million tons of fish per year from the fur seal habitat.¹⁰⁵

lation (OSP). According to the regulations, OSP, which is considered to be a healthy condition for a marine mammal stock, extends downward from OCC to maximum net productivity. Any population which is smaller than its maximum healthy size, although within the range of OSP, is therefore nonsensically defined as "depleted." Within the definition of "depleted" therefore, OCC must be given a completely different meaning until this definition is amended.

102. See NOAA General Counsel Opinion, *supra* note 52.

103. See generally Nafziger, *supra* note 3. Nafziger's suggestion for dealing with the term is interesting:

The definition of "optimum carrying capacity" is highly circuitous, ambiguous and inferentially identified with OSP itself. In operation the term would have at most an indirect role. It is best, then, simply to ignore it, leaving the two variables of "maximum productivity of the population or species" and the "health of the ecosystem."

Id. at 169-70. While this construction is expedient, it is unlikely that a court would find it acceptable.

104. See, e.g., NOAA General Counsel Opinion, *supra* note 52, at 27.

105. Personal communication with Dr. William Aron, Nat'l Marine Fisheries Service (April 9, 1980). Robert Eisenbud, NOAA General Counsel, also expressed the concern that the carrying capacity of United States waters off Alaska is declining:

[S]ome people . . . feel that one of the major problems with the North Pacific fur seal population is overfishing, and that the carrying capacity of the habitat is being reduced by overfishing and that the impact of seals on fish are [sic] a lot less than the impact of men fishing on seals. . . .

[T]he impact of man fishing, reducing the carrying capacity, was having an adverse effect on seal population because the carrying capacity was going down. The food source is going down as a result of fishing pressure.

Oversight of the Marine Mammal Protection Act of 1972; To Review the Implementation, Administration, and Enforcement of the Act: Hearings Before the House Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries, 94th Cong., 1st Sess. 232 (1975).

The most pronounced impact on fisheries would be felt if OCC were based on a static preexploitation or contemporary figure for carrying capacity. Such a requirement would create a permanent standard by which to measure marine mammal populations. Fishing activities would have to be curtailed drastically, perhaps even eliminated, in order to raise mammal populations to the preexploitation figure, or fishing activities would be restricted to a current level. In both cases interference with the development of fisheries might be politically and economically unacceptable.

An interesting possibility would arise if a preexploitation figure were accepted. If a marine mammal species or population stock is dependent on a food source which is the target of a contemporary fishery, then the maximum carrying capacity of the mammals' environment would always be far below OCC. The statutory definition of OCC would be rendered meaningless since it would not correspond at all to the actual carrying capacity of the environment.

Alternatively, OCC could be defined as a dynamic figure. In that case, fishery harvests which affect marine mammals' food sources would lower the OCC. That in turn could result in a reduction in marine mammal populations. Ironically, before the impact of a lowered carrying capacity was reflected in the actual marine mammal populations, the population would be above OCC. A regulated direct taking under the MMPA would then theoretically be warranted. As more fish are removed more mammals may be taken by direct harvest or incidental catch. The dynamic definition of OCC is thus best for fishery interests but could emasculate the MMPA.

A decision on the temporal nature of OCC would not clarify the ambiguity of the concept entirely. The implications of the term "optimum" would still have to be defined. The MMPA does not indicate what factors should be considered in determining whether the carrying capacity of a given habitat is at its "optimum." Certainly "optimum" requires consideration of the health and environmental effects of a marine mammal population level at carrying capacity.¹⁰⁶ Should other species' health and other uses of the environment be considered as well? If so, what weight should be given these other considerations? Can subjective values play a part? Whose values will these be? Absent statutory limitations on the definition of "optimum," agency discretion is wide.

The ambiguity of the concept of OCC is, of course, compounded by its statutory definition which refers to the similarly unclear concept of optimum sustainable population (OSP). OSP is defined in part by reference back to OCC.

106. 16 U.S.C. § 1362(8) (1976). See also NOAA General Counsel Opinion, *supra* note 52.

An agency or judicial interpretation of OCC has not yet appeared, so the actual implications of the term for fisheries are not yet known. Within NOAA, opinion favors a dynamic or current measure,¹⁰⁷ although the view has been expressed at the Marine Mammal Laboratory in Seattle, Washington, a NMFS institution, that a constant preexploitation level for OCC might best serve marine mammal interests.¹⁰⁸ It seems likely that the NOAA opinion would prevail in any preliminary agency hearing or regulation drafts. However, because the MMPA does not expressly address the temporal issue, and because under either a current or a dynamic definition it could be possible for marine mammal interests to become subordinate to fishing interests, both protectionists and the MMC would probably take issue with such a result.

c. Purposes and Policies: "optimum sustainable population"

Congress declares in the MMPA a major objective to maintain marine mammals as "significant functioning elements" of their ecosystem, and a secondary objective to prevent diminution of marine mammal species and stocks below their optimum sustainable population.¹⁰⁹ That secondary goal should be pursued whenever it would be consistent with pursuit of the major objective.¹¹⁰

The MMPA defines OSP to mean "with respect to any population stock, the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element."¹¹¹ This definition is circular because OCC is defined as the "ability of a given habitat to support the optimum sustainable population of a species or population stock in a healthy state without diminishing the ability of the habitat to continue that function."¹¹²

Regulations which implement OSP describe it as a "population size which falls within a range from the population level of a given species or stock which is the largest supportable within the ecosystem to the population level that results in maximum net productivity."¹¹³ Maximum net productivity is that population level at which the stock of mammals can

107. *Id.*

108. Personal communication with Dr. Bruce McAlister, Nat'l Marine Fisheries Service (July 1979).

109. 16 U.S.C. § 1361(2) (1976).

110. 16 U.S.C. § 1361(6) (1976).

111. 16 U.S.C. § 1362(9) (1976).

112. 16 U.S.C. § 1362(8) (1976).

113. 50 C.F.R. § 216.3 (1979).

grow in size at the fastest rate.¹¹⁴ It is well below the carrying capacity of the habitat because it requires that each animal have all the food that it can use and suitable, uncrowded breeding grounds. Therefore, the population of a stock is at OSP if it is at or below the carrying capacity and at or above the level of maximum net productivity.

Of all the MMPA provisions, that which sets OSP as a population goal has generated the most consternation for marine resource managers and administrators. The MMPA introduces this concept to the scientific community as a goal of scientific resource conservation and management. Unfortunately, it has no clearly understood or agreed-upon meaning. It has been said not to be a scientific concept at all, but merely a concept to which scientific meaning has been ascribed.¹¹⁵ Use of the qualifier "optimum" makes OSP suspect as a scientific concept by raising the possibility of an unarticulated interjection of subjective values into the decision making process.¹¹⁶ This article will not discuss the ambiguities which surround OSP as this topic has been discussed in several critical commentaries.¹¹⁷

Whatever definitive interpretation is eventually reached, it appears that OSP will remain a population goal for marine mammals. In *Committee for Humane Legislation, Inc. v. Richardson*,¹¹⁸ the federal district court observed that the MMPA is a strict protectionist statute and concluded that no incidental catch in the course of commercial fishing could be permitted unless all relevant provisions of the MMPA were followed. Since then, the NMFS has allowed incidental catches only after determining that the population level of the marine mammals concerned meets the minimum requirements of OSP.¹¹⁹

The requirement under the FCMA that fisheries management be consistent with relevant law such as the MMPA becomes difficult to comply with when a marine mammal population goal is involved. Consistency with policies designed to avoid damage or drastic changes in the marine ecosystem and policies designed to protect species whose numbers appear to be so low that survival is threatened could be effected with a measure

114. The regulations define maximum net productivity as the "greatest annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth losses due to natural mortality." *Id.*

115. Personal communication with Professor Edward Miles, Institute for Marine Studies, University of Washington (March 1980).

116. Cf. note 106 and accompanying text *supra* (OCC concept requires subjective values).

117. See, e.g., MMC OSP Report, *supra* note 8; NOAA General Counsel Opinion, *supra* note 52; Nafziger, *supra* note 3.

118. 414 F. Supp. 297, 314 (D.D.C.) *aff'd*, 540 F.2d 1141 (D.C. Cir. 1976).

119. Nat'l Oceanic and Atmospheric Admin., Nat'l Marine Fisheries Service, U.S. Dep't of Commerce, Draft Environmental Impact Statement on the Incidental Take of Dall Porpoise in the Japanese Salmon Fishery 4 (Jan. 1981).

of compromise. While compromise would perhaps make attainment of FCMA goals a degree less likely, it would not do so to a politically and economically unacceptable degree. But, when the policy requires that marine mammal populations be at a certain level, the possibility of compromise is eliminated. Fisheries harvests must change a determined amount, even if that requires elimination of a fishery. More than any other provision of the MMPA, OSP has the potential to conflict with FCMA goals. Consistency with OSP will probably mean “subordinate to” OSP.

As defined in the regulations, OSP is useless as a standard for limiting resource competition by fishermen with marine mammals. As the ability of a habitat to support marine mammals is reduced by resource competition, both the carrying capacity and the level of maximum net productivity are reduced, in turn reducing both of the measures of OSP. A species or stock of marine mammals would then remain unprotected from resource competition until it becomes threatened or endangered as defined in the Endangered Species Act (ESA).¹²⁰

Reliance on the ESA may be an acceptable solution to the problem of resource competition. Three of the factors used under the ESA to determine whether a species is endangered or threatened could be invoked in an indirect take situation: (1) “present or threatened destruction, modification, or curtailment of [the species’] habitat or range;” (2) “inadequacy of existing regulatory mechanisms;” or (3) “other natural or manmade factors affecting [the species’] continued existence.”¹²¹ Within the meaning of “species,” the ESA includes subspecies and distinct population segments,¹²² which correspond to the management units established by the MMPA. The ESA was used in this manner in an attempt to protect the endangered California brown pelican from resource competition over anchovies in a FMP prepared by the Pacific Fishery Management Council (PFMC).¹²³

d. Purposes and Policies: “areas of similar significance”

Among the Congressional findings and declarations of policy in the MMPA is the directive that “efforts should be made to protect the rooker-

120. 16 U.S.C. §§ 1531–1543 (1976).

121. 16 U.S.C. § 1533(a)(1), (4)–(5) (1976).

122. 16 U.S.C. § 1532(11) (1976).

123. Pacific Fishery Management Council Final Environmental Impact Statement on the Fishery Management Plan for the Northern Anchovy Fishery (1978). The pelican depends on the anchovy for food, and its reproductive success is linked to anchovy abundance, as the Draft FMP revealed. The objectives of the FMP are, *inter alia*, to sustain adequate levels of predator bird stocks. *Id.* There is, however, no attempt to define an “adequate” level for the predator stock. According to one critic, this accommodation is somewhat “broad brush.” Hammond, *supra* note 39, at 34.

ies, mating grounds, and areas of similar significance for each species of marine mammal from the adverse effect of man's actions."¹²⁴ Because the legislative history does not mention this provision, the intended meaning of this directive must be derived from the context.

The paragraph in which this language appears establishes two goals for marine mammal species and population stocks. First, they are to be maintained at levels at which they are "significant functioning element[s] in the ecosystem of which they are a part."¹²⁵ Second, when consistent with this objective, they "should not be permitted to diminish below their optimum sustainable population."¹²⁶ Efforts to protect rookeries, mating grounds, and similarly significant areas are specifically noted as part of "further measures [which] should be immediately taken to replenish any species or population stock which has already diminished below [optimum sustainable] population."¹²⁷ The provision is, therefore, intended to provide a means of increasing or supporting marine mammal populations.

That rookeries and mating grounds should be protected from the "adverse effect of man's actions" is a laudable goal. Other wildlife legislation extends such protection,¹²⁸ and government action which approved or appeared indifferent to activities which were harmful to these areas would almost certainly, if discovered, elicit great protest. Such activities would also almost certainly fall under the MMPA definition of "take."¹²⁹ However, the MMPA does not define "significance" or describe what is meant by "areas of similar significance" to rookeries and mating grounds. Expansive interpretation of these terms could seriously conflict with FCMA objectives.

Since Congress was referring to areas similar in significance to rookeries and mating grounds, all areas which figure at some point in the breeding and reproductive processes could conceivably be included within the Act's protection. It is possible to find that food-seeking activities by nursing female mammals constitute part of those processes. Such a finding could expand considerably the areas to be protected, especially for cetaceans.

"Significant areas" can be interpreted even more expansively. The phrase could mean the full reach of the marine environment which supplies marine mammals with the energy requirements which must be met

124. 16 U.S.C. § 1361(2) (1976).

125. *Id.*

126. *Id.*

127. *Id.*

128. *E.g.*, The Endangered Species Act, 16 U.S.C. §§ 1531-1543 (1976).

129. The term "take" means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." 16 U.S.C. § 1362(13) (1976). *See* note 43 and accompanying text *supra*.

to insure healthy populations and successful reproduction. For certain species, this area might extend over much of the 200-mile fishery conservation zone (FCZ).

Determination of the physical extent of significant areas does not end the inquiry into the potential scope of conflict between this MMPA provision and the FCMA. It is also necessary to determine what is meant by "adverse effect" and to assess which of man's actions cause such an effect.

Effects can be measured in terms of individual animals or in terms of population stocks or even species. Since the language under scrutiny speaks of rookeries, mating grounds, and areas of similar significance for each species, it appears that Congress was thinking of effects on schools, herds, or colonies of marine mammals, rather than on individual animals.¹³⁰

The severity of these effects will be a function primarily of the species involved and the scale of human activity. Various species respond quite differently to interactions with humans. For example, the Hawaiian monk seal becomes anxious and agitated by the mere approach of a human, whereas porpoises have been known to initiate interactions with humans. Responses of groups of mammals to humans may also depend on the mammals' activities at the time, such as nursing. Finally, the responses of a school, herd, or colony may be discernible only over time.

The kind and extent of protective measures to be taken will vary according to the species involved, the effect guarded against, and the reach of "significant" areas.¹³¹

To the extent this provision of the MMPA has the potential to withdraw areas of the 200-mile FCZ from fishing activities, management of interrelated fish stocks becomes much more difficult, and perhaps impossible. The FCMA directive that "interrelated stocks of fish shall be managed as a unit or in close coordination"¹³² could thus be frustrated.

The language of the MMPA should be amended, or interpreted by courts or agencies, to limit areas in need of special protection to land-

130. This is not necessarily the correct interpretation. Elsewhere the MMPA speaks of the take of "any marine mammal." *E.g.*, 16 U.S.C. §§ 1371(a), 1372(a) (1976). The effect of that provision is to allow application of MMPA sanctions in instances where a single marine mammal has been bothered.

131. The least conflict potential will arise if: (a) "significant areas" are confined to clearly delineated geographic locales utilized by marine mammals for obvious phases of the breeding process, such as mating and births; (b) the presence of humans does not disturb the species of mammals sufficiently to impact their reproductive cycle; (c) the effect is temporary and has no serious long term consequences; (d) the area is not a major part of an exploited fishery. Curative measures need only involve establishing areas and seasons in which passage of vessels and fishing would be curtailed. Such measures need not be an unreasonable constraint on fishing.

132. 16 U.S.C. § 1851(a)(3) (1976).

based locales critical in mating and birthing. Protective zones can be drawn around these areas and fishing and other activities can be limited, creating a kind of marine mammal sanctuary. Provisions of the MMPA which allow for habitat acquisition could be used for this purpose.¹³³ The provision should not be utilized to increase marine mammal food supplies by curtailing fishing activities.

e. Purposes and Policies: "health and stability of the marine ecosystem"

The MMPA states that marine mammals "should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and . . . the primary objective of their management should be to maintain the health and stability of the marine ecosystem."¹³⁴ That an ecosystem might be characterized in terms of either health or stability is a concept newly introduced by the MMPA. As a "primary objective" of management, its meaning and implications deserve attention.

Neither the MMPA nor its implementing regulations indicate what meaning Congress ascribed to ecosystem health and stability. Ecosystem is a conventional concept for which a definitional consensus exists. A group of interacting populations functioning together as a unit forms an ecosystem.¹³⁵ In the absence of contrary evidence, this definition may be assumed for the term "ecosystem" as used in the MMPA.

It is more difficult to ascertain what Congress meant with its reference to the "health and stability" of the marine ecosystem. The legislative history refers to the concept without clarifying it.¹³⁶

Ecosystems are not traditionally described in terms of their health or stability. Stability is an especially inappropriate description since the most obvious characteristic of an ecosystem is change. "Essentially every available measure of the temporal changes in a population or an ecosystem indicates change rather than constancy."¹³⁷

Scientists have attempted to develop indicia of a healthy ecosystem in

133. 16 U.S.C. § 1362(2) (1976).

134. 16 U.S.C. § 1361(6) (1976).

135. MMC OSP Report, *supra* note 8, at 2.

136. Marine mammals are resources of great significance and . . . it is congressional policy that they should be protected and encouraged to develop consistent with sound policies of resource management. The primary objective of this management must be to maintain the health and stability of the marine ecosystem; this in turn indicates that the animals must be managed for their benefit and not for the benefit of commercial exploitation.

H.R. REP. NO. 707, 92d Cong., 1st Sess. 22 (1971).

137. MMC OSP Report, *supra* note 8, at 76.

the process of interpreting the MMPA, although the commonly held scientific opinion is that ecosystems are neither healthy nor unhealthy but merely extant.¹³⁸ A report issued by the MMC suggests that a healthy ecosystem is “one where the rates of nutrient element cycling and energy flow are within certain bounds, and the amounts of stored nutrients and energy are within other fixed bounds.”¹³⁹ This definition attempts to identify the conditions in which constituent population can exist.¹⁴⁰ An unhealthy ecosystem would be one in which there occurs a rapid net loss of either nutrients or energy or both which would diminish the subsequent ability of the ecosystem to sustain its constituent populations.¹⁴¹ This definition in effect equates a healthy ecosystem to one able to support its constituent population of marine organisms.¹⁴² Population levels of all marine organisms are, therefore, an indicator of the health of the ecosystem.¹⁴³ If the population of any marine organism declines due to lack of food or to habitat degradation, this suggests that the health of the ecosystem is declining. If such a population reduction can be shown to be caused by the failure of federal administrators to manage marine mammals in accordance with the objective that the health of the ecosystem be maintained, then management actions must be modified accordingly.

For example, if a population of organisms which depends upon the cycling of nutrients by mammals declines because the incidental catch of mammals has been too large, then the fishing which caused the incidental catch can perhaps be curtailed. Likewise, if a population of fish declines because large numbers of mammals have eaten their source of food, this might be considered a reduction in the health of the ecosystem calling for a larger permitted incidental catch of these mammals. Although the health of the ecosystem provision can thus be used to benefit fishing interests, it is more likely to pose a much greater threat as additional authority to curtail fishing activities.

138. Personal communication with Dr. Bruce McAlister, Nat'l Marine Fisheries Service (June 1979).

139. MMC OSP Report, *supra* note 8, at 44.

140. *Id.*

141. *Id.* at 44–45.

142. This can differ from the ability of the habitat to support a population. “Habitat” is usually understood to consist only of the physical environment where individuals of a species are most likely to be found. In contrast, an ecosystem consists of the habitat and the community of organic life within.

143. Congress may have viewed the situation differently, conceiving of the health of the ecosystem as a function of marine mammal populations: “[T]he disappearance or serious reduction in the population levels of marine mammals . . . can lead to a more generalized disruption of the marine environmental balance.” *Legislation for the Preservation and Protection of Marine Mammals: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation of the House Comm. on Merchant Marine and Fisheries*, 92d Cong., 1st Sess. 201 (1971) (letter of Harrison M. Symmes, Dep’t of State).

There are not yet any agency or court rulings on this provision. Although the provision is much commented upon and criticized¹⁴⁴ because of its ambiguity and lack of established meaning, few published analyses have appeared. This primary goal of maintaining the health and stability of the marine ecosystem has so far been ignored. It has been predicted, however, that failure to adopt measures to implement this goal will become the subject of litigation in the future.¹⁴⁵

f. *Purposes and Policies: “ ‘conservation’ and ‘management’ ” and “ ‘habitat acquisition and improvement’ ”*

The purposes and policies section of the MMPA states that “conservation of marine mammals is . . . necessary” and that marine mammals should be managed.¹⁴⁶ “ ‘Conservation’ and ‘management’ ” is defined to include “habitat acquisition and improvement.”¹⁴⁷ The MMPA does not, however, delineate the boundaries or otherwise describe the nature of “habitat.”

With respect to boundaries, the MMPA uses the term “habitat” in reference to both species and population stocks.¹⁴⁸ It is reasonable to assume that habitat under the MMPA can be coextensive with the physical environment in which any species or population stock occurs. The MMPA covers all marine mammal species,¹⁴⁹ many of which are extremely far-ranging. For certain cetaceans, for example, “habitat” could be under-

144. E.g., *Oversight of the Marine Mammal Protection Act of 1972: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 93d Cong., 1st Sess. 465 (1973–1974) (statement of Victor Scheffer, former director of the Marine Mammal Comm'n) (“[Y]ou will certainly agree that there are many definitions . . . which are rather wide open. ‘Health and stability of the marine ecosystem’ is a rather rough one.”); Scarff, *The International Management of Whales, Dolphins, and Porpoises: An Interdisciplinary Assessment*, 6 *ECOLOGY L.Q.* 323, 394 (1977) (“[T]he terminology of the [Marine Mammal Protection] Act is ambiguous, imprecise, and nearly impossible to apply in particular management situations. Terms such as ‘significant functioning element in the ecosystem,’ ‘carrying capacity,’ and ‘health of the ecosystem’ are rarely quantifiable given our present level of knowledge of marine ecosystems.”).

145. Lecture by Edward Evans, School of Law, University of Washington (April 28, 1979).

146. 16 U.S.C. § 1361 (1976).

147. The terms “conservation” and “management” means [sic] the collection and application of biological information for the purposes of increasing and maintaining the number of animals within species and populations of marine mammals at the optimum carrying capacity of their habitat. Such terms include the entire scope of activities that constitute a modern scientific resource program, including, but not limited to, research, census, law enforcement, and habitat acquisition and improvement. Also included within these terms, when and where appropriate, is the periodic or total protection of species or populations as well as regulated taking.

16 U.S.C. § 1362(2) (1976).

148. 16 U.S.C. § 1362(8) (1976).

149. See note 6 and accompanying text *supra*.

stood to include oceans covered in the course of circumpolar navigation. For purposes of exercising jurisdiction under the MMPA, however, the farthest reach of any marine mammal habitat will be out to 200 miles from United States baselines.¹⁵⁰ Many habitats under MMPA scrutiny will, of course, coincide with fisheries under the coverage of the FCMA.

The MMPA suggests that the function of habitat is to “support the optimum sustainable population of a species or population stock in a healthy state without diminishing the ability of the habitat to continue that function.”¹⁵¹ Habitats will thus be evaluated under the MMPA in terms of their capacity to support marine mammal populations at levels directed by Congress, with particular emphasis on the adequacy of available food sources and the ability of the size of the habitat to satisfy spatial requirements for growth. The health of fishery resources must also be evaluated if they are prey for the marine mammal species or population stock in question.

Conflict between this provision for “habitat acquisition and improvement” and the FCMA will arise when three conditions coincide. First, a marine mammal habitat under scrutiny also functions as the habitat of the target species of a commercial fishery which is a food source for the mammals. Second, the population of marine mammals is below OSP. Third, an inadequate food supply is believed to have caused or contributed to the reduction in size of the marine mammal population. Conflict will occur if “improvement” of the habitat is construed to allow curtailment or elimination of fishing efforts in order to increase the available marine mammal food supply.

It can be argued that “habitat acquisition and improvement” should be limited to simple, low-impact actions, such as reserving an island rookery and a surrounding buffer zone for a population stock. But the MMPA does not indicate that any such limit on the application of this provision was intended. This ambiguity leaves the language open to an expansive interpretation with a potentially high impact on fishing efforts.

III. THE LACK OF A BALANCING MECHANISM IN THE MMPA

That the FCMA and MMPA are based on opposing values does not create an inherent conflict. The problem is that the acts considered together provide inadequate mechanisms for balancing these conflicting

150. The FCMA extends the reach of the MMPA to coincide with the 200-mile FCZ. Fishery Conservation and Management Act of 1976, Pub. L. No. 94-265, § 404, 90 Stat. 361 (1976) (amending 16 U.S.C. § 1362(15)(B) (1976)).

151. This is from the MMPA definition of OCC. 16 U.S.C. § 1362(8) (1976).

values. By defining "optimum yield" to allow for consideration of social and ecological factors and by incorporating "other applicable law," the FCMA at least contains ample provision for recognizing the value of protecting marine mammals. It places the burden of balancing the conflicting values, if balancing is to be done, on the MMPA. But the MMPA does not contain adequate provisions for recognizing the value of developing commercial fisheries.¹⁵²

A. *The MMPA's Ineffective Recognition of Conflicting Values*

There are two provisions of the MMPA which provide some recognition of the value of commercial fishing: (1) the incidental catch exception and (2) the requirement that regulations which implement the MMPA exceptions take into consideration "the conservation, development, and utilization of fishery resources."¹⁵³ But neither of these provisions sufficiently allows for compromise. Commercial fishing must yield completely to the intransigent values of protecting marine mammals.¹⁵⁴

1. *The Incidental Catch Exception*

The exception for incidental catch of marine mammals in the course of commercial fishing is the major recognition of commercial interests made in the MMPA. Such incidental catch is allowed by permit subject to the "immediate goal that the incidental kill or incidental serious injury of marine mammals permitted in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate."¹⁵⁵ This exception was created as a concession to the domestic yellowfin tuna industry.

152. *Committee for Humane Legislation, Inc. v. Richardson*, 540 F.2d 1141, 1149 (D.C. Cir. 1976). The court noted that its decision was dictated by the legislation:

A major subject of controversy in the instant appeals has been the extent to which the American tuna fishing industry would be harmed by withdrawal of the general permit for purse-seine fishing on porpoise pending completion of the actions necessary to bring the parties into compliance with the Act. We accept as sufficiently demonstrated that the tuna fleet would be seriously harmed by such a ban. The arguments, however, properly should be addressed to Congress rather than to the courts. Balancing of interests between the commercial fishing fleet and the porpoise is entirely a legislative decision, dictated at present by the terms of the Act.

Id. at 1151 n.39.

153. 16 U.S.C. § 1373(b)(4) (1976).

154. *See Committee for Humane Legislation, Inc. v. Richardson*, 414 F. Supp. 297 (D.D.C.), *aff'd*, 540 F.2d 1141 (D.C. Cir. 1976).

155. 16 U.S.C. § 1371(a)(2) (1976). The incidental catch exception provided first for a two-year grace period, during which incidental catches could continue subject to "conditions and regulations . . . to insure that those techniques and equipment are used which will produce the least practicable hazard to marine mammals in . . . commercial fishing operations." 16 U.S.C. § 1371(a)(2) (1976).

For years, the domestic tuna industry relied upon pole and bait harvest methods. In the 1950's, the discovery that yellowfin tuna congregate in great schools beneath porpoise schools and the invention of the power block led to fleetwide abandonment of the pole and line method of fishing and adoption of purse seine techniques. By "setting on" the porpoise schools, the tuna fishermen are led directly to the tuna beneath. The purse seine nets, while efficiently encircling tons of tuna, simultaneously encircle the porpoises. Death by drowning, shock, abortion or other injuries is the result for thousands of porpoises. Purse seining in this way has allowed the domestic tuna industry to grow spectacularly. It was not evident for many years that the great commercial success of the industry had been achieved at the expense of eastern tropical Pacific porpoise stocks. By the time the situation became known, two species, the eastern spinner and white spotted porpoises, appeared to be suffering from heavy exploitation.

Extensive media coverage and compilation of statistics of tuna fleet porpoise catches have created the inaccurate impression that incidental take of marine mammals in the course of commercial fishing occurs only in the tuna fishing industry. Other fisheries, notably salmon seining and gillnetting, halibut longlining, and king mackerel trolling, involve incidental catches of such marine mammals as Dall porpoises and sea lions.¹⁵⁶ Some of this incidental catch occurs in domestic commercial fisheries and some in the course of foreign fishing within the 200-mile FCZ, as in the case of the Japanese North Pacific fishing operations.¹⁵⁷

As new fisheries open up in the North Pacific and Bering Sea, the large numbers of marine mammals in these areas will be thrust into continual

Following the two-year period, the MMPA allows incidental catch to continue under permit, subject to regulation. During the two-year grace period, regulations were to be designed to "reduce to the lowest practicable level the taking of marine mammals incidental to commercial fishing operations." 16 U.S.C. § 1381(b) (1976). However, the MMPA provided more specifically with reference to the tuna industry for "negotiations . . . to reduce to the maximum extent feasible the incidental taking of marine mammals by vessels involved in the tuna fishery." 16 U.S.C. § 1381(c) (1976). With reference to all fisheries, the quoted goal that mortality and serious injury caused by incidental catch be reduced to insignificant levels became effective at the end of the two-year grace period. The legislation calls for reports estimating deaths and injuries under current and future technology and it appropriates funds for a Department of Commerce gear and technology research and development program. 16 U.S.C. § 1381(a) (1976). In addition, the MMPA authorizes an observer program on "any commercial vessel." 16 U.S.C. § 1318(d) (1976).

156. Marine Mammal News, May 1978, at 3; *Oversight of the Marine Mammal Protection Act of 1972: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 93d Cong., 1st Sess. 147, 236 (1973-1974) (statement of B.C. Crabb, Div. of Law Enforcement, Dep't of the Interior; report of the Dep't of Commerce on the International Program of the MMPA).

157. Nat'l Oceanic and Atmospheric Admin., Nat'l Marine Fisheries Service, U.S. Dep't of Commerce, Draft Environmental Impact Statement on the Incidental Take of Dall Porpoise in the Japanese Salmon Fishery 1 (Jan. 1981).

interaction with increasing numbers of fishermen. The incidental catches of the non-tuna fishing industry will come under closer scrutiny by protectionists, the MMC, and the NPFMC.

The incidental catch exception applies generally to incidental catches of all marine mammal species in any commercial fishery. Whether or not this extensive effect was intended is unknown. Certainly the legislative history of the provision creates the impression that only the tuna-porpoise situation was really under consideration.¹⁵⁸ Despite the ambiguity of intent, however, the legal effect of the incidental catch exception by its terms applies to all fisheries.

The exception for incidental catch, while theoretically a mechanism by which compromise and balance between the objectives of the MMPA and FCMA can be struck, fails to achieve this result for four reasons.

First, incidental catch must proceed under permit and is subject to regulation by the Secretaries of Commerce and of the Interior.¹⁵⁹ Accordingly, the problem associated with these regulations (“not to the disadvantage of,” “consistent with the purposes and policies”) attend incidental catch.¹⁶⁰

Second, the exception was written for the tuna industry and is not especially well suited for non-tuna fishing interests. Although 95% of the United States marine mammal stocks occur in the area now under the jurisdiction of the NPFMC, fishing industries from that area did not significantly participate in the development of the incidental catch provision. Input received by legislators on the incidental catch issue came only from the tuna industry—the industry with the most at stake in continued incidental catch—and from marine mammal protectionists.

Other industry groups were not considered probably because of the inadequacy of data and an impression that, in contrast to the huge mammal hauls in tuna purse seine nets, incidental catch elsewhere, by other means, was insignificant. Yet incidental catches in other areas can be expected to increase as harvest efforts become more intense and widespread. It is the non-tuna fishing industries that the FCMA promotes and in which the greatest growth is anticipated.

Since the non-tuna fishing interests were not consulted in the legislative process, they will probably be the least receptive to the imposition of the regulated incidental catch exception scheme. Assuming receptivity by the non-tuna industries is low, enforcement will become a serious problem

158. See *Reducing Porpoise Mortality: Hearings on H.R. 6146, H.R. 6409, H.R. 6729, H.R. 6807, H.R. 6907, H.R. 6928 and H.R. 6970 Before the House Comm. on Merchant Marine and Fisheries*, 95th Cong., 1st Sess. (1977).

159. 16 U.S.C. § 1373 (1976). See notes 70–79 and accompanying text *supra*.

160. See generally part II B *supra*.

because it is expensive and logistically difficult to monitor the large numbers of small vessels used in many fisheries in the vast area over which they fish. Compliance, therefore, will be low.¹⁶¹

The tuna industry was believed to have the technological capability to modify its purse seine techniques and gear to an extent necessary to meet the very low catch levels the MMPA establishes.¹⁶² The tuna industry itself has been unable to meet fully the expectation of gear modification as the solution to the incidental catch situation.¹⁶³ The outlook is therefore not promising for fishing industries which use other gear which may be even less easily modified, if at all. The legislation may thus be raising expectations which can never be fulfilled. Those upon whom such expectations are placed may accordingly find themselves in violation of the MMPA.

The third reason for the likely inefficacy of the incidental catch exception as a balancing mechanism is the goal of a zero marine mammal mortality and serious injury rate, which infuses the exception with a strong bias toward complete protection. Although it is only a remote¹⁶⁴ and theoretical goal, it would suffice as legal authority for allowing only extremely low incidental catches.

Finally, although the mere existence of the exception indicates that the MMPA contemplates some balancing between protectionism and productive use, there is nothing in the Act which tells federal administrators how to strike that balance in various situations. For example, is it possible under the Act that a marine mammal can be so abundant that fishing activities need not be curtailed at all under the MMPA? Must incidental catch

161. Personal communication with Michael Stanley, NOAA General Counsel (August 1979). Most fishermen in the Alaska area dispensed with the requirement that they obtain incidental catch permits a year or so after passage of the MMPA in 1972.

162. "The legislative history of the MMPA indicates Congress granted this special incidental catch exception after being assured by representatives of the tuna industry that they had found a solution, through tuna fishing gear modifications, to the porpoise mortality problem." Committee for Humane Legislation, Inc. v. Richardson, 414 F. Supp. 297, 301, *aff'd*, 540 F.2d 1141 (D.C. Cir. 1976). August Felando, President of the American Tuna Association, objects to this notion, pointing out that, in his opinion, only one statement was made to this effect during the legislative hearings. Personal communication with August Felando, American Tuna Association (May 16, 1980). The statement referred to was made by Captain Joe Medina, testifying before the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries, reporting on the new "Medina panel" in the backing down procedure. Medina told the Subcommittee "we have the problem licked." See Committee for Humane Legislation, Inc. v. Richardson, 414 F. Supp. 297, 301 n.8 (D.D.C.), *aff'd*, 540 F.2d 1141 (D.C. Cir. 1976). Felando may be correct, since a cautionary note was injected in later hearings by Dr. Kenneth Norris, at the time chief scientist with the Marine Mammal Division of the Oceanic Institute in Hawaii, and by Congressman Pelly. See *id.* at 301 n.9. The House Report merely states that "the industry is *hopeful* that the excessive kills of the past will now be stopped." H.R. REP. NO. 707, 92nd Cong., 1st Sess. 16 (1971) (emphasis added).

163. See generally Marine Mammal News (1977-1980).

164. H.R. REP. NO. 1488, 92d Cong., 2d Sess. 23 (1972).

still be limited even if a habitat is overpopulated? Although the Act suggests that gear and fishing methods must be changed to protect marine mammals even where costs are high,¹⁶⁵ what happens if the costs are extremely high? Can there ever be a large enough loss to certain fishing interests to outweigh the benefit of protecting a marine mammal stock that is not threatened or below maximum net productivity? The Act offers no standards for answering these questions with respect to incidental catch allowances.

2. *Required Consideration of Fishery Resources*

The MMPA prescribes the substantive content of the regulations required for the taking and importation of marine mammals when permitted.¹⁶⁶ Three situations are covered: incidental catch of marine mammals in the course of commercial fishing, waiver of the moratorium, and take by Alaska natives of a depleted stock. When promulgating regulations to implement these three exceptions, the Secretaries of Commerce and of the Interior are directed to consider fully all factors which might bear upon the extent of taking or importing which should be allowed. Among the factors which must be considered are "the conservation, development, and utilization of fishery resources."¹⁶⁷ This provision appears to balance the interest in protecting marine mammals against the interest in protecting fishery resources. But it may in practice have no beneficial effects for fishing interests for two reasons.

First, the Secretaries are only required to consider whether their actions might affect fishery resources. They are under no obligation to modify their regulations to protect or promote the conservation, development and utilization of fishery resources.

Second, and perhaps more importantly, three standards which the regulations must meet could make it impossible for the regulations to reflect any such considerations of conservation, development and utilization of fishery resources. First, the regulations must "insure that such taking will not be to the disadvantage of . . . [marine mammal] species and population stocks"; second, regulations must be "consistent with the purposes and policies" of the MMPA; and third, the regulations must be based on the "best scientific evidence available."¹⁶⁸ As discussed previously, the first two provisions fairly well insure that no balance between productive use and protectionism will be achieved.

165. 16 U.S.C. § 1373(b)(5) (1976).

166. 16 U.S.C. § 1373(b) (1976).

167. 16 U.S.C. § 1373(b)(4) (1976).

168. 16 U.S.C. § 1373(a) (1976).

Balancing the MMPA and FCMA

The third provision recognizes that scientific understanding of the ecosystem is very limited¹⁶⁹ and directs administrators to promulgate regulations as best they can. Five years after passage of the MMPA, Richard Frank, NOAA Administrator, noted before a Senate Commerce Committee confirmation hearing that he was “informed that the information on many of the marine mammal populations which are involved in commercial fishing operations other than the yellowfin tuna fishery, while perhaps adequate to meet the requirements of the law, remain unsatisfactory from the point of view of our long-term responsibilities.”¹⁷⁰ Species for which knowledge is inadequate include Dall porpoises, harbor porpoises, certain sea lions, harbor seals, pilot whales, and beluga whales.¹⁷¹ Even for the porpoises involved in the yellowfin tuna industry, which is certainly one of the most studied, precise estimates of maximum net productivity are said to be unlikely to be available for most porpoise stocks in the near future.¹⁷²

Because the MMPA is strongly protectionist, federal administrators must resolve all doubts arising from the paucity of data in favor of marine mammals. Rather than choosing a balance between productive use and

169. The paucity of scientific data was noted by both the Senate and the House in their committee reports:

[E]xisting research and management programs within the federal government dealing with marine mammals are quite small. Most of our present efforts are directed toward the Alaska fur seals, themselves the subjects of international treaties and supporting Federal legislation. . . .

[Department of] Interior and Commerce research and management programs for all other marine mammals have not exceeded \$200,000 in the aggregate.

H.R. REP. NO. 707, 92d Cong., 1st Sess. 13 (1971). “[I]nformation should be obtained on marine mammals so that science can make an adequate interpretation of the entire marine environment to predict what would happen to marine mammals under different management programs and increasing utilization of marine resources by society and industry,” S. REP. NO. 863, 92d Cong., 2d Sess. 10 (1972). The lack of data is also bemoaned by the MMC OSP Report, *supra* note 8, at 35; the Nat’l Marine Fisheries Service, personnel communication with Dr. William Aron, Nat’l Marine Fisheries Service (April 9, 1980); state managers, Institute for Marine Studies, University of Washington, Symposium (March 1980); scientists, *Oversight of the Tuna-Porpoise Problem: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 94th Cong., 2d Sess. 336 (1976); and FMC members, personal communication with Dr. Edward Miles, Institute for Marine Studies, University of Washington (March 1980).

The language of the MMPA itself acknowledges that “there is inadequate knowledge of the ecology and population dynamics of such marine mammals and of the factors which bear upon their ability to reproduce themselves successfully” 16 U.S.C. § 1361(3) (1976).

170. Marine Mammal News, July 1977, at 4.

171. *Id.*

172. *Oversight of the Tuna-Porpoise Problem: Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 94th Cong., 2d Sess. 48–49 (1976) (statement of Dr. William W. Fox, NOAA). A few species of marine mammals have been studied rather more in depth, such as the Pribilof Island fur seal herds and the California sea otters. The MMPA tries to remedy this lack of data by making grants available for marine mammal research. 16 U.S.C. § 1380 (1976).

protection based on the best estimate of populations and interactions, administrators must act on the most conservative estimates.¹⁷³ This conservative approach is unquestionably justified whenever there is a chance that a mammal population is endangered. But, where it is known that a population is numerous enough not to be threatened, yet little is known about whether the population is above or below the optimum carrying capacity, the conservative bias creates undesirable results. Under the conservative approach, fishing which might harm these mammals would have to be curtailed if the population might be low enough to justify it, even if the population is probably high enough that fishing should not be curtailed at all. If a population is clearly not endangered or threatened, decisions should be allowed to rest on the best estimates rather than the most conservative estimates to minimize unnecessary curtailment of fishing.

B. *Proposed Standards for Balancing Conflicting Values*

Federal administrators must be provided with statutory authority and adequate guidance to choose the best compromise between conflicting values of maximum productive use and complete protection. As the court concluded in *Committee for Humane Legislation, Inc. v. Richardson*,¹⁷⁴ the present scheme allows no compromise in the protection of marine mammals to avoid serious curtailment of fishing.

Through the incidental catch exception, the MMPA provides a method for balancing conflicts resulting from one form of direct take. As discussed above, however, there are no adequate standards for applying this exception, especially for the non-tuna fishing industries. The MMPA does not address the problems of resource competition at all. It contains no procedure for regulating resource competition and the standards for regulating direct interference are inapplicable to the resource competition situation.

The MMPA should, therefore, be amended to provide a suitable procedure and adequate standards for resolving the conflict between protection

173. The House Committee Report noted that the lack of data requires a conservative approach: [I]n the teeth of this lack of knowledge . . . and of the certain knowledge that these animals are almost all threatened in some way, it seems elementary common sense . . . that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding these animals that might prove to be adverse or even irreversible until more is known. As far as could be done, we have endeavored to build such a conservative bias into the legislation here presented.

H. R. REP. No. 707, 92d Cong., 1st Sess. 15 (1971). In *Committee for Humane Legislation, Inc. v. Richardson*, 540 F.2d 1141, 1150 (D.C. Cir. 1976), the court of appeals concluded that the MMPA requires a conservative protectionist approach and cited the House Committee Report.

174. 540 F.2d 1141, 1150 (D.C. Cir. 1976).

and production in both direct interference and resource competition problem areas. The standards for balancing these values might follow the following general form. First, an absolute value might be accorded to prevent the extinction of any marine mammal species. Second, the health of a species or population which is somewhat threatened but not in danger of extinction might be given a high value which could be overcome only by very serious economic losses to society. Third, for a marine mammal population which is not threatened yet still below maximum net productivity, economic losses might be required to be substantial, but less than very serious, to overcome the interest in protection. Fourth, where a marine mammal population is in the range of optimum sustainable population, the fishing industry and the national economy should be required to bear only a small cost for protection.

IV. CONCLUSION

The two most important acts which regulate the effects of human activity on living marine resources within United States waters are the Fishery Conservation and Management Act and the Marine Mammal Protection Act. The MMPA regulates interactions with marine mammals and the FCMA regulates interactions with almost all other living marine resources except sea birds and tuna. Because any human activity which affects one marine species will also affect other species within the ecosystem, rational management requires that the management of marine mammals and fishery resources be carefully coordinated.

The FCMA adopts a coordinated ecosystem management approach for all resources that it regulates, with the objective of deriving the maximum long-term benefits from all marine resources. But the MMPA only provides adequately for the needs of mammals and adopts a rigid protectionist management scheme. There are many areas where these two management schemes conflict, and, because the FCMA contains a deferential provision which requires consistency with all other applicable law, achievement of MMPA objectives must be given preference over achievement of FCMA objectives. This article has attempted to show that the result may be a substantial reduction in the total benefit society can reap from the oceans.

A serious omission from this bifurcated management scheme for living marine resources is the lack of a mechanism for balancing the conflicting objectives of the two acts. It is indisputable that all marine mammals should receive some level of protection and that the presence of marine mammals generates aesthetic, educational, and scientific benefits for society. But the worldwide nutritional and economic benefits of gathering

food from the oceans should be allowed to offset additional protection for marine mammals when they are not threatened or endangered and the chance for greater food production is high.