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INTRODUCTION

The United States is the fifth largest fishing nation in the world.[1] In 1980 the U.S. commercial fishing industry caught 6.5 billion pounds of fish valued at approximately $2.2 billion[2] and the annual contribution of the recreational fishing industry appears to have a similar economic impact.[3] Over the past 5 years most sectors of the commercial fishing industry have grown, with new records on the size of the commercial catch set in 1978, 1979 and 1980, and a growing demand overseas for fish caught and processed in the United States.[4] Much of this recent growth in the fishing industry can be traced to passage of the Fishery Conservation and Management Act (FCMA) in 1976.[5] This statute claims exclusive U.S. control over virtually all living marine resources within 200 miles of U.S. shores. The Act creates a 197-mile wide "Fishery Conservation

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1. NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEP'T OF COMMERCE, CURRENT FISHERY STATISTICS NO. 8100, FISHERIES OF THE UNITED STATES, 1980, at 38 (1981) [hereinafter cited as NAT'L MARINE FISH. SERV. NO. 8100].

2. *Id.* at IV.

3. A 1972 study estimated that marine related outdoor recreational expenditures, including fishing, totaled $5.18 billion. F. W. BELL, FOOD FROM THE SEA: THE ECONOMICS AND POLITICS OF OCEAN FISHERIES 239 (1978). A 1974 study of 23 coastal states estimated that the $3.1 billion value of salt water fishing's gross expenditures and various non-market values was equal to or greater than the value of the commercial fishery in the same area. *Id.* at 58.

4. NAT'L MARINE FISH. SERV. NO. 8100, *supra* note 1 at IV.

5. Pub. L. No. 94-265, 90 Stat. 331 (1976); codified at 16 U.S.C. §§ 1801–1882 (1980). Section 237 of Pub. L. No. 96-561, the Salmon and Steelhead Conservation and Enhancement Act, changed the title of the 1976 Act to the Magnuson Fishery Conservation and Management Act. To conform to other published literature, however, this article will continue to use the term Fishery Conservation and Management Act or its abbreviation, "FCMA."

Zone" (FCZ),[6] enclosing 2,250,000 square miles[7] of ocean space and severely limiting foreign fishing. By giving priority to domestic fishermen and processors,[8] the FCMA effectively controls exploitation of approximately 20 percent of the world's marine fish resource.[9]

Passage of the FCMA has increased the importance of the domestic fishing industry in both national and international trade and politics. The value of fish caught in the FCZ is approximately $1 billion per year.[10] Adding catch from the inshore waters, plus the economic activity generated by onshore processing and distribution, the commercial fishing industry contributes $5–7 billion to the gross national product each year.[11] The demand for fish in the United States far outstrips available domestic supply and approximately 54 percent of all fish consumed are imported.[12] Due to the exclusion of foreign fleets from the U.S. zone, the U.S. industry is starting to produce domestic equivalents for many of these imports, often with the financial assistance of foreign interests. Demand for U.S. fish products overseas has also increased since passage of the FCMA and the volume of exports has more than doubled since 1976.[13] In short, the FCMA is turning many sectors of commercial fishery into a growth industry, with many economic and institutional implications.

At first glance, the FCMA appears to be strongly exploitative in orientation. The stated objective of the Act is "to promote domestic and recreational fishing, . . ."[14] and the debate surrounding its passage focused, in part, on the need to develop the domestic fishing industry. A careful reading of the Act and a review of the management system it established, however, indicates that the FCMA has a strong conservation orientation.[15] The FCMA creates a complex management system that operates under far-reaching "National Standards for Fishery Conservation and Management."[16] These standards codify principles of sustained yield management of marine fisheries for the first time, forcing government decision-makers to take into account new biological, economic and social

6. 16 U.S.C. § 1812 (1976).

7. OFFICE OF TECHNOLOGY ASSESSMENT, ESTABLISHING A 200-MILE FISHERIES ZONE 24 (1977) [hereinafter cited as OFFICE OF TECHNOLOGY ASSESSMENT].

8. 16 U.S.C. §§ 1821–1826 (Supp. IV 1980).

9. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 7, at 3.

10. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEP'T OF COMMERCE, CURRENT FISHERY STATISTICS NO. 8000, FISHERIES OF THE UNITED STATES, 1979, at 11 (1980).

11. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 7, at 7.

12. BELL, *supra* note 3, at 58.

13. NAT'L MARINE FISH. SERV. NO. 8100, *supra* note 1, at 58.

14. 16 U.S.C. § 1801(b)(3) (1976).

15. *See generally* Warner, Finamore & Bean, *Practical Application of the Conservation Aspects of the Fishery Conservation and Management Act*, 5 HARV. ENVTL. L. REV. 30 (1981).

16. 16 U.S.C. § 1851 (1976).

issues.[17] This new management system has had a major impact on the fishing industry and the government agencies charged with implementation of the FCMA.

Passage of the FCMA elevates the importance of marine fisheries and alters the federal government's traditional role in the management of marine resources. If the sustained yield management principles codified in the Act are to succeed, the relationship between the federal role in fisheries and in other more conventional forms of marine resource exploitation, such as energy development, may have to change. Frequently, multiple use conflicts between fisheries and other forms of marine resource exploitation center on certain types of critical marine fish habitats. Sustained yield management, as defined by the FCMA, is dependent upon recruitment of young fish into adult, harvestable, fish stocks. Spawning, egg and larvae survival, and the growth rate of many fish species are highly sensitive to natural and man-made change in the marine environment.[18] Often, these key stages in the life history of commercially important species are linked to specific estuarine, coastal, or offshore habitats.[19] To date, however, the federal agencies involved have dismissed or ignored linkage between the need to protect these habitat areas and successful implementation of the FCMA.[20]

To preserve present and future benefits deriving from passage of the FCMA, those charged with management of marine resources must understand and act upon conservation aspects of the Act. Despite the magnitude of the resources at stake, the organized conservation community and the fishing industry rarely link the protection of marine habitat to the management principles mandated by the FCMA. This article therefore defines the key conservation elements of the Act and related common law principles as they pertain to fisheries management and the protection of marine habitat. Part I introduces the principles of sustained yield management found in the FCMA, and examines their biological and institutional implications.[21] Part II reviews implementation of the conservation elements of the Act,[22] including the link between marine habitat protection and successful execution of the FCMA. This section also presents examples of institutional response to disputes over multiple use of marine habitat areas since passage of the Act.[23] Finally, the article suggests a change in the coordination mechanisms that govern federal management

17. *See infra* text accompanying notes 72–73.
18. *See infra* text accompanying notes 95–111.
19. *See infra* text accompanying notes 153–163.
20. *See infra* text accompanying notes 196–209.
21. *See infra* text accompanying notes 25–124.
22. *See infra* text accompanying notes 136–203.
23. *See infra* text accompanying notes 164–203.

of marine resources to reflect the sustained yield management principles codified by the FCMA.[24]

I. THE CONSERVATION ASPECTS OF THE FCMA

A. *Overview*

Congress passed the Fishery Conservation and Management Act (FCMA) on April 13, 1976 and formally established the 197-mile wide exclusive "Fishery Conservation Zone" (FCZ)[25] on March 1, 1977. To fulfill its objective of "promot[ing] domestic commercial and recreational fishing under sound conservation and management principles,"[26] the Act creates new law in three broad areas. First, the Act claims exclusive management authority over fish[27] and "all other forms of marine animal and plant life other than marine mammals, birds, and highly migratory species"[28] in the 2,500,000 square mile FCZ, thereby taking control of one-fifth[29] of the world's marine fishery resource. Second, the FCMA, including several recent amendments, establishes a complex procedure for allocating U.S. controlled fish to foreign nations.[30] A basic principle of the Act is to allow continued foreign fishing for species not fully utilized by the domestic fleet.[31] Finally, the FCMA establishes a multi-tiered regulatory system, operating under broad statutory principles which codify sustained fishery management concepts for the first time.[32] These "National Standards for Fishery Conservation and Management"[33] are at the root of the Act's strong conservation orientation, and create a mandate with major implications for both fisheries management and government efforts to protect critical marine habitat.

The Act creates eight Regional Fishery Management Councils.[34] Each council is comprised of representatives from coastal states, the National

24. *See infra* text accompanying notes 209–218.
25. 16 U.S.C. § 1811 (1976).
26. *Id.* § 1801(b)(3).
27. *Id.* § 1812(1).
28. *See id.* § 1802(14). The Act defines "highly migratory species" as "species of tuna which, in the course of their life cycle spawn and migrate over great distances in the waters of the ocean." Other migratory species such as salmon, billfish, and certain sharks fall under the Act's jurisdiction.
29. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 7, at 3.
30. 16 U.S.C. §§ 1821–1826 (1982).
31. *Id.* § 1821.
32. *Id.* §§ 1851–1855. The Act also establishes civil and criminal procedures for enforcement of regulations, *id.* §§ 1857–1861, and several miscellaneous provisions, including a grant of authority to the Secretary of Commerce to amend regulations to conform to any subsequently ratified Law of the Sea Treaty, *id.* § 1881, and an amendment of the Marine Mammal Protection Act to extend its coverage to the outer boundary of the FCZ. *Id.* § 1801(a).
33. *Id.* § 1851(a).
34. *Id.* § 1852(a).

Oceanic and Atmospheric Administration (NOAA),[35] industry and the general public. The councils are charged with developing a "fishery management plan" (FMP) for each major commercial and recreational offshore fishery found within their region.[36] The Act, however, gives NOAA, not the councils, the power to approve,[37] implement,[38] and enforce each plan.[39] Each FMP must be consistent with the national standards and other applicable law,[40] contain a description of the fishery,[41] and an assessment of the probable future condition of the resource.[42] The plan must specify the estimated optimum yield (OY)[43] and maximum sustainable yield (MSY)[44] for the fishery and review the ability of U.S. vessels and processors to handle projected yearly yields.[45]

The Act gives the councils and NOAA wide discretion in choosing specific management techniques as long as they are fully explained in the FMP.[46] In practice, the councils prepare a draft FMP with the help of technical committees and resource assessments prepared by NOAA scientists. The draft plan and associated environmental impact statement are used in public hearings and for state and federal coordination. The final FMP, accompanied by proposed implementing regulations[47] and a final environmental statement, must be approved by the Secretary of Commerce.[48] Secretarial approval is based upon a determination that the FMP is consistent with the national standards.[49]

The Act's complex and often cumbersome[50] management system gives the quasi-independent councils and the federal government responsibilities far beyond anything that had existed before passage of the FCMA in

35. NOAA is a part of the United States Department of Commerce. The Act gives management authority to the Secretary of Commerce who has delegated that authority to the Administrator of NOAA. The National Marine Fisheries Service (NMFS), a subsidiary agency within NOAA, is generally responsible for the day to day implementation of the FCMA. For the purposes of this paper the term NOAA will be used instead of "the Secretary" or "NMFS" to avoid confusion.

36. 16 U.S.C. § 1852(h)(1) (1976).

37. *Id.* § 1854(a)(2).

38. *Id.* § 1855(c).

39. *Id.* § 1861 as amended Oct. 19, 1980 Pub. L. No. 96-470, Title II, § 209(e) (94 Stat. 2245).

40. *Id.* § 1853(a)(1)(c). For example, all regulations promulgated by NOAA to implement a FMP must comply with the procedural and substantive provisions of the National Environmental Policy Act, 42 U.S.C. §§ 4321–4347, 4331 (1980).

41. *Id.* § 1853(a)(2).

42. *Id.* § 1853(a)(3).

43. *See infra* text accompanying note 73.

44. *See infra* text accompanying notes 81–94.

45. 16 U.S.C. § 1853(a)(4) as amended Aug. 28, 1978, Pub. L. 95-354, 92 Stat. 521.

46. *Id.* § 1853(b).

47. *Id.* § 1853(c).

48. *Id.* § 1854.

49. *Id.* § 1854(b).

50. *See, e.g.*, the editorial entitled *Sane Management Is Possible*, 61 NAT'L FISHERMEN 6 (March 1981).

1976. Starting in the mid-1960s, large modern fleets of foreign fishing vessels appeared off U.S. shores.[51] By 1976 the traditional patchwork system of international treaties, voluntary agreements, and individual state laws governing fisheries was unable to prevent rampant overfishing. Following a worldwide pattern,[52] the U.S. Congress began to move towards a unilateral extension of federal jurisdiction over all living resources within two hundred miles of shore. Congress passed the FCMA in 1976 over the strong foreign policy objections of President Ford and the State Department.[53] The Act's preamble expresses congressional dissatisfaction with the status of marine fisheries,[54] making the FCMA more than a simple claim to a 200-mile wide exclusive fishing zone. For example, in hopes of preserving state and regional interests, the Act created the regional councils,[55] although ultimate management authority remains with the Department of Commerce.[56] More importantly, Congress incorporated the national standards into the Act to halt mismanagement of fisheries and to broaden the basis upon which management decisions were made.[57]

B. The National Standards for Fishery Conservation and Management

The seven national standards found in Title III of the FCMA[58] contain

51. SENATE COMM. ON COMMERCE, 94TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976, 659–65, 1094–95 (Comm. Print 196) [hereinafter cited as LEGISLATIVE HISTORY].

52. Many other coastal nations extended exclusive jurisdiction over marine fisheries in the mid-1970's including Canada, Mexico, and the Soviet Union. As of January 1981, 86 countries had established 200-mile wide zones similar to that of the United States. Personal communication, Dr. Lewis Alexander, Office of the Geographer, U.S. Dep't of State, Washington, D.C., Feb. 1981.

53. LEGISLATIVE HISTORY, *supra* note 51, at 1094–95.

54. 16 U.S.C. § 1801(a)(2).

55. Note, *supra* note 34.

56. *Id.* §§ 1854(a)(1), 1855(c), 1861.

57. LEGISLATIVE HISTORY, *supra* note 51, at 1095.

58. 16 U.S.C. § 1851(a). The seven standards are as follows:

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

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

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

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

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

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

the clearest guidance on the Act's goals and objectives.[59] The standards flatly prohibit overfishing,[60] require the use of the best scientific information available,[61] discourage duplication,[62] and require that fishery managers take long term natural and man-made variations in fish stock into account.[63] A theme of managing fisheries on a continuing, long term basis is present throughout, as shown by inclusion of the phrase "conservation and management measures" at the start of each of the seven national standards. The Act defines conservation and management measures as all rules, regulations, and other methods:

> (A) which are required to *rebuild, restore, or maintain* . . . [a] fishery resource and the marine environment; and (B) which are designed to assure that—
>
> (i) a supply of food and other products may be taken, and that recreational benefits may be obtained, *on a continuing basis;*
>
> (ii) *irreversible or long-term adverse effects* on fishery resources and the marine environment *are avoided;* and
>
> (iii) there will be multiplicity of options available with respect to future uses of these resources (emphasis added).[64]

A close examination of the seven national standards reveals subtle but significant differences. Three of the standards need only be taken into account where practicable. These standards concern administrative and jurisdictional matters such as promoting efficiency,[65] minimizing costs and duplication,[66] and managing fish stocks without regard to jurisdictional boundary.[67] The remaining four standards, however, directly address substantive fishery conservation and management issues which provide the link between protection of marine habitat and successful implementation of the FCMA. Standard number one states that "[c]onservation and management measures *shall* prevent overfishing . . ." (emphasis added).[68] Standard number two requires that [c]onservation and manage-

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

59. The Act's findings, purposes and policy are also helpful in understanding the conservation objectives of the FCMA. For example, the theme of sustained yield management can be found in the Act's initial findings section where Congress states that "fishery resources are finite, but renewable. If placed under sound management before over-fishing has caused irreversible effects, the fisheries can be conserved and maintained so as to provide yields on a continuing basis." *Id.* § 1801(a)(5).

60. *Id.* § 1851(a)(1).
61. *Id.* § 1851(a)(2).
62. *Id.* § 1851(a)(7).
63. *Id.* § 1851(a)(6).
64. *Id.* § 1802(2).
65. *Id.* § 1851(a)(5).
66. *Id.* § 1851(a)(7).
67. *Id.* § 1851(a)(3).
68. *Id.* § 1851(a)(1).

ment measures *shall* be based upon the best scientific information available" (emphasis added).[69] Standard number four dictates that "[c]onservation and management measures *shall not* discriminate between residents of different states . . ." (emphasis added), and requires that management measures be fair and equitable.[70] Finally, standard number six mandates that "[c]onservation and management measures *shall* take into account . . . variations among . . . fisheries, fishery resources, and catches" (emphasis added).[71]

The first, second and sixth standards combined with other sections of the Act[72] codify principles of sustained yield fisheries management for the first time. In particular, the objective of optimum yield (OY), found in the first national standard, both broadens the basis upon which management decisions are made and incorporates the biological concept of maximum sustainable yield (MSY) into federal law. Optimum yield is defined as 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.[73]

Management of renewable resources such as fish, wildlife, and timber generally has two objectives: maximizing economic returns and preserving the sustainable nature of the resource. Generally, fishery managers develop criteria for controlling harvest based upon a species' reproductive rate, population size, and other factors in hopes of assuring sustainable catch levels and steady economic returns. For many fisheries, strict biological criteria for management are either impossible to develop, due to a lack of data, or fail to reflect unique social and economic characteristics of the fishermen and vessels involved. Thus, the definition of OY uses a biological determination of the MSY of a fish stock as a starting point for management decisions. While the definition of OY permits modification of MSY to take economic and social considerations into account, a biological determination of the sustained yield of a fish stock remains a central part of management under the FCMA.

The sixth national standard[74] buttresses the definition of OY by requiring that natural and man-made variations in fish stocks be taken into account. The sixth standard may, in fact, require that NOAA and the

69. *Id.* § 1851(a)(2).
70. *Id.* § 1851(a)(4).
71. *Id.* § 1851(a)(6).
72. *Id.* § 1801(a)(b)(c) ("Findings, purposes and policy").
73. *Id.* § 1802(18).
74. *Id.* § 1851(a)(6).

councils utilize long-term planning and provide a margin of safety in management plans, according to the legislative history of the Act:

> There can be great uncertainty with regard to the location, size, and even the very existence of fish stocks. There are often great peaks and valleys in annual catch statistics for many fisheries . . . Therefore, there must be a margin of error in the management system to provide a buffer in favor of the resource.[75]

The sustained yield management principles found in the national standards have implications beyond those found in the statute itself. The FCMA gives the federal government exclusive management authority over virtually all living resources in an ocean area two-thirds the size of the land area of the United States.[76] This authority, which is governed by the seven national standards, elevates the importance of marine fisheries, placing new responsibilities upon the federal government. Thus the FCMA is, in part, an organic statute creating a new management system, similar to statutes establishing national parks and forests and the U.S. claim over the mineral resources of the Outer Continental Shelf.[77] Each of these resources are governed by statutory and common law duties expressed by a doctrine of "public trust" and requiring wise and careful management with a strong conservation emphasis.[78] Finally, the Act's passage increases the importance of fisheries in federal management of all marine resources. If the principles envisioned in the FCMA are to succeed, institutional mechanisms that govern the federal management of marine resources must be strengthened.[79]

C. Biological Concepts of Sustained Yield Management

To assure future harvests and maximize the stream of potential economic benefits, most fish stocks require some form of active management. Thus, the first national standard is the cornerstone of fisheries management under the FCMA. The standard states that "[c]onservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery."[80] An examination of the biological concepts behind the terms "overfishing" and "optimum yield" reveals the FCMA's strong conservation orientation and provides the link between implementation of the Act and protection of critical marine habitat.

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75. LEGISLATIVE HISTORY, *supra* note 51, at 687.

76. The land area of the United States, including Alaska and Hawaii, is approximately 3,618,500 square miles.

77. *See infra* text accompanying notes 110–132.

78. *See infra* text accompanying notes 110–129.

79. *See infra* text accompanying notes 214–218.

80. 16 U.S.C. § 1851(a)(1) (1976).

1. Overfishing

In drafting the Act, the Senate Commerce Committee noted that the first national standard's prohibition of overfishing is "the most basic objective of fishery management. . . . There should be no uncertainty that the basic goal of management is to protect the productivity of fish stocks."[81] Fishery managers therefore define their biological objective as "the surplus production of the fishery; the safe upper limit of harvest which can be taken consistently, year after year, without diminishing the stock so that the stock is truly inexhaustible and perpetually renewable."[82] Traditionally, this annual "surplus production" is defined as the fishery's maximum sustainable yield. A simple definition of overfishing, therefore, would be a level of harvest which exceeds the estimated MSY of a fish stock.[83]

A conventional calculation of the MSY of a fish stock[84] seeks to estimate the largest average catch that can be continuously harvested under existing environmental conditions.[85] The traditional concept of MSY assumes that a stock of fish produces its greatest harvestable surplus when it is at an intermediate level of abundance. When an unharvested stock is at its maximum density, reproductive efficiency is reduced and there are many old, slow growing fish in the population. Introduction of a fishery increases stock production (in terms of recruitment and growth) by removing older fish of harvestable size, reducing competition with other sectors of the population, and thereby increasing growth and reproductive success in the stock as a whole.[86]

To determine the amount of surplus fish available for harvest, estimates

81. LEGISLATIVE HISTORY, *supra* note 51, at 685.

82. *Id.* at 1098.

83. Depending upon the assessment techniques used, biologists often distinguish between "growth over-fishing" and "recruitment over-fishing." Growth over-fishing occurs when fish are caught that are younger than is consistent with sustainable yield at a given harvesting effort. Recruitment over-fishing occurs when more fish are caught than are replaced by the reproduction of the remaining adult fish population. Cushing, *Dependence of Recruitment on Parent Stock*, 30 J. FISHERIES RESEARCH BD. CAN (1973). While it is often difficult to identify the precise point at which over-fishing occurs, biologists can watch for a series of "danger signals" such as a combination of ever higher catch per unit of fishing effort, decreasing overall abundance, and a decrease in the average size of fish caught.

84. Marine fish species are generally managed on the basis of "stocks" or populations. A management stock can be defined as that portion of the entire population of a species which is under consideration for actual or potential utilization. Managers try to shape the boundaries of a management unit according to biological parameters such as genetic similarities, or the location of spawning grounds and migration routes. However, precise boundaries are difficult and migration in and out of a particular stock can occur, frustrating sustainable yield estimates.

85. Ricker, *Computation and Interpretation of Biological Statistics of Fish Populations*, 191 BULL. FISHERIES RESEARCH BD. CAN. 4 (1975).

86. Zuboy & Jones, *Everything You Have Wanted to Know About O.Y. and M.S.Y. but Were Afraid to Ask* 3-4 (1978) (looseleaf manuscript prepared by the Southeast Fisheries Center, National Marine Fisheries Service, U.S. Dep't of Commerce, Miami, Florida).

of the growth rate (G), natural mortality (D_M), and the recruitment (R) of young fish into the harvestable stock are necessary. The level of fishing mortality (D_F), or harvest, is then expressed as a portion of the total biomass of the exploitable population (B) where[87]

$$B = R + G - D_M - D_F$$

If, as mandated by the FCMA, overfishing is prohibited, then "B" must remain constant and annual harvest (D_F) must be no higher than predicted recruitment (R) plus the growth of individuals in the population (G), minus expected natural mortality (D_M) or

$$D_F = R + G - D_M$$

If the FMCA's dual goals of promoting the domestic fishing industry and prohibiting overfishing are to be realized, variations in recruitment, growth, and natural mortality must be kept to a minimum as they affect the size of the yearly harvest. Thus natural or man-made factors that influence a fish stock's recruitment, growth and natural mortality can have a major impact on the successful implementation of the Fishery Conservation and Management Act.

2. *The Importance of Recruitment*

Recruitment of young fish into a harvestable population, growth of individual fish, and natural mortality all affect a conventional MSY calculation. Ideally, variations in these three parameters are treated concurrently in a fish population model; however, data limitations often require that one parameter be considered constant. One group of MSY models assumes that while the rate of recruitment will increase as the size of the exploitable stock decreases, the absolute number of recruits will not vary from year to year.[88] The available harvest is first expressed in terms of projected yield per recruit and then converted into an estimate of potential harvest for the stock as a whole.[89]

A second method assumes recruitment as the key variable and that growth rates and natural mortality will not vary with the size of the stock.[90]

87. Sissenwine, Brown, & Brennan-Hoskins, *Brief History and State of the Art of Fish Production Models and Some Applications to Fisheries off the Northeastern United States*, CLIMATE AND FISHERIES, PROCEEDINGS FROM A WORKSHOP HELD MARCH 29–31, 1978, at 28 (1979) (available from the Center for Ocean Management Studies, Univ. of Rhode Island, Kingston) [hereinafter cited as Sissenwine].

88. Ricker, *supra* note 85, at 4. The absolute number of recruits, however, does not vary with the stock density, but may fluctuate from year to year in response to outside environmental variations. *Id.*

89. *See generally* Beverton & Holt, *On the Dynamics of Exploited Fish Populations*, FISHERIES INVESTIGATIONS (SERV. 2) (1977) (published by the U.K. Ministry of Agriculture and Fisheries). *See also* Ricker, *supra* note 85 at 235–264.

90. Ricker, *supra* note 85, at 24, 265–96.

Often used in commercially important fisheries such as New England haddock, redfish (also called ocean perch), and silver hake (also called whiting), this model is highly sensitive to fluctuations in recruitment due to change in the marine environment.[91] A model using growth rates as the key variable has also been proposed,[92] and ecosystem-wide population models are being developed in Alaska and elsewhere that take predation and competition into account.[93]

Inaccurate prediction of recruitment appears to be the major cause of variability in the sustained yield models used in fisheries management in the United States.[94] Accurate prediction of the impact of environmental fluctuations on the early life stages of commercially important fish species is thus a key biological aspect of successful sustained yield management under the FCMA.

3. *The Impact of Natural and Man-Made Fluctuations in the Marine Environment*

Environmental variables can have a significant impact on the rate of recruitment and the calculation of the MSY of a fish stock. On a strictly empirical basis, conventional fish population models used to calculate MSY are extremely sensitive to random fluctuations in recruitment. For example, in a statistical study of the so-called Schaefer production model,[95] the difference between the predicted MSY and the actual number of fish available for harvest increased together with the magnitude of random fluctuations in recruitment on both a year-to-year basis and over a 25 year period.[96] Other fish population models have similar problems and require substantial revisions when environmental fluctuations are taken into account.[97] The fact that many of the generally accepted fish population models are so sensitive forced one investigator to conclude that "in the presence of fluctuations in production, attempts to remove the MSY yield each year from a stock lead to disaster."[98]

The impact of natural environmental fluctuations on recruitment (and

91. Sissenwine, *supra* note 87, at 37, 45–6.

92. Ricker, *supra* note 85, at 24.

93. *See generally* Laevastu & Fovorite, *Summary Review of the Dynamical Numerical Marine Ecosystem Model (DYNMES).* PROC. NMFS/EDS WORKSHOP ON CLIMATE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEP'T OF COMMERCE (1976).

94. Sissenwine, *supra* note 87, at 25.

95. *See* Ricker, *supra* note 85, at 265–296. *See also* Schaefer, *Some Aspects of the Dynamics of Populations Important to the Management of Commercial Fisheries,* 4 BULL. INTER-AM. TROPICAL TUNA COMM'N 24 (1954).

96. *See generally* Sissenwine, *The Effects of Random Fluctuations on a Hypothetical Fishery,* in SELECTED PAPERS NO. 2, INT'L COMM'N ON NW. ATL. FISHERIES 137–41 (1977).

97. *See generally* Getz & Swartzman, *A Probability Transition Matrix Model for Yield Estimation in Fisheries with Highly Variable Recruitment,* 38 CAN. J. FISHERIES & AQUATIC SCI. 847–55 (1981).

98. Doubleday, *Environmental Fluctuations and Fisheries Management,* in SELECTED PAPERS NO. 1, INT'L COMM'N ON NW. ATL. FISHERIES 141–150 (1976).

on the calculation of MSY) can be seen in the following examples. A comparison between expected yield and water temperature indicates that relatively minor changes in temperature can have a significant impact on recruitment in yellow tail flounder stocks off New England.[99] By altering conventional MSY models to take this variable into account, investigators have been able to successfully match predicted and actual harvest over a 25 year period.[100] Prevailing winds, rainfall and other climatic factors also can have a dramatic impact on recruitment in commercially important fish stocks.[101] Thus, estimates of Gulf of Mexico harvests for several commercially important shrimp stocks take variations in the marine environment into account. Several recent shrimp population models relate projected yield to the freshwater discharge of the Mississippi River, since change in the volume of river waters entering the Gulf of Mexico affects shrimp stock recruitment.[102]

Man-made fluctuations in the marine environment can have similar but more localized impact. For example, debates over upstream dams and diversions along the Delaware River center on the impact of regulated stream flows on oyster larvae and predators in estuarine oyster beds in Delaware Bay, and on the blockage of upstream spawning areas for the American shad and other anadromous fish.[103] Much of the controversy surrounding the leasing of Georges Bank, off the coast of Massachusetts, for oil and gas development also centered on the impact of oil spills on recruitment in commercially important fish stocks.[104] The Georges Bank region supports as many as five relatively discrete stocks or sub-populations of economically valuable fish and shellfish species.[105] As fish eggs and larvae are sensitive to fairly low levels of hydrocarbons in the water column,[106] many in fisheries management are concerned that these partially isolated stocks will be slow to recover from an oil spill.[107]

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99. *See generally* Lux & Nichy, *Growth of Yellowtail Flounder, Limanda Ferrugiuea (Storer), on Three New England Fishing Grounds*, 6 INT'L COMM'N ON NW. ATL. FISHERIES BULL. 5–25 (1969).

100. *See supra* note 96.

101. *See generally* Sissenwine, *supra* note 87.

102. *See generally* Griffen, Lacewell, & Nichols, *Optimum Effort and Rent Distribution in the Gulf of Mexico Shrimp Fishery*, 58 AM. J. AGRIC. ECON. 644–652 (1976).

103. BELL, *supra* note 3; Socolow, *Failure of Discourse, in* BOUNDARIES OF ANALYSIS AND INQUIRY INTO THE TOCKS ISLAND DAM CONTROVERSY 25–30 (Feiverson, Sinden, & Socolow, eds. 1976).

104. BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF INTERIOR, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PROPOSED 1979 OUTER CONTINENTAL SHELF OIL AND GAS LEASE SALE OFFSHORE THE NORTH-ATLANTIC STATES, OCS SALE NO. 42, 522–23 (1979) (includes "Georges Bank Marine Sanctuary Issue Paper," Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Dep't of Commerce, at 491–576).

105. *Id.* at 598–605.

106. *Id.* at 526–42.

107. *Id.* at 598.

The sensitivity of sustained yield management fish population models to variations in recruitment suggests a link between successful implementation of the FCMA and the protection of critical marine habitat.[108] Identification of the spawning and nursery areas of commercially important species is often possible. Several of the fishery management plans required by the FCMA have limited or prohibited fishing in such areas to protect the stock and assure high levels of future recruitment.[109] Protection of key habitat areas from damage by fishermen alone cannot assure the success of the sustained yield management principles mandated by the FCMA. Control of other activities, such as oil and gas development, may also be required if the implementation of the FCMA is to succeed.

D. Further Implications of Passage of the FCMA

1. The Public Trust Doctrine

Passage of the FCMA codifies the principle of sustained yield management of marine fish stocks for the first time. The Act requires that the National Oceanic and Atmospheric Administration (NOAA) rebuild, restore, and maintain fish stocks,[110] while flatly prohibiting overfishing.[111] NOAA is also required to preserve multiple options for the future use of the resource.[112] The Act mandates state of the art management techniques[113] sensitive to biological, social and economic concerns.[114] The Federal agencies involved in marine resource management have additional duties and responsibilities beyond those mandated in the FCMA and other statutes. These duties are rooted in common law and state and federal legislation governing natural resources, and are loosely grouped under the rubric of "public trust."

The public trust doctrine recognizes that government serves as a "public guardian of those valuable natural resources which are not capable of self-regeneration and for which substitutes cannot be made by man."[115]

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108. *See infra* text accompanying notes 151–156.

109. *See, e.g.*, fishery management plans for the surf clam and ocean quahog, 50 C.F.R. § 652.23, Tanner Crab, 50 C.F.R. § 671.21, and Atlantic Herring, 50 C.F.R. § 653.20 (1981).

110. 16 U.S.C. § 1801(a)(6) (1976).

111. *Id.* § 1851(a)(1).

112. *Id.* § 1802(2).

113. *Id.* § 1851(a)(2).

114. *Id.* § 1802(18).

115. Cohen, *The Constitution, the Public Trust Doctrine, and the Environment*, UTAH L. REV. 388 (1970). The basis for modern usage of the public trust concept in the United States stems from President Theodore Roosevelt's National Conservation Commission:

> The resources which have required ages for their accumulation . . . of intrinsic value and quality . . . to which human agency has not contributed, . . . must serve as the welfare of the nation. In the highest sense, therefore, they should be regarded as property held in trust for the use of the race rather than for a single generation

The doctrine's origins trace back to early Roman law governing beaches, harbors and tidelands,[116] and to English common law where the sovereign claimed ownership of lands under navigable waters and all fish and wildlife.[117] In the United States, the federal government and the courts have often applied the doctrine to riparian lands in an effort to assure public access and maximize public use.[118] In the case of wildlife, the doctrine follows English common law in holding that "ownership" of fish and game lies with the state which must manage these resources in "trust for the benefit of the people."[119] When applied, the doctrine requires that government protect a resource against permanent harm and consider the needs of future generations by emphasizing conservation. In addition, the doctrine prohibits an individual or a group from exploiting the resource at the expense of the public as a whole.[120]

Statutes on endangered species,[121] marine mammals,[122] and national parks,[123] monuments and forests[124] repeatedly emphasize the federal gov-

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and for the use of the nation, rather than for the benefit of a few individuals who may hold them by right of discovery or by purchase.

REPORT OF THE NAT'L CONSERVATION COMM'N, S. DOC. NO. 676, 60th Cong., 2d sess. 109 (1909). *See also* Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970); Sax, *The Public Trust Doctrine: A New Approach to Environmental Preservation*, 81 W. VA. L. REV. 455 (1979).

116. Nanda & Ris, Jr., *The Public Trust Doctrine: A Viable Approach to International Environmental Protection*, 5 ECOLOGY L.Q. 291, 297 (1976).

117. After the signing of the Magna Carta, wildlife ownership "was vested in the office of the king, to be held in sacred trust for the people." W. SINGLER, WILDLIFE LAW ENFORCEMENT 17 (1972).

118. *See generally* H. F. Althaus, J. M. Chambers, & P. J. Hines, PUBLIC TRUST RIGHTS (1978) (published by Fish and Wildlife Service, U.S. Dep't of Interior).

119. R. POUND, AN INTRODUCTION TO THE PHILOSOPHY OF LAW 111 (1922).

> We are also tending to limit the idea of discovery and occupation by making *res nullius* (e.g., wild game) into *res publicae* and to justify a more stringent regulation of individual use of *res communes* (e.g., of the use of running water for irrigation or for power) by declaring that they are the property of the state or are 'owned by that state in trust for the people.' It should be said, however, that while in form our courts and legislatures seem thus to have reduced everything but the air and the high seas to ownership, in fact the so-called state ownership of *res communes* and *res nullius* is only a sort of guardianship for social purposes. It is *imperium*, not *dominum*. The state as a corporation does not own a river as it owns the furniture in the state house. It does not own wild game as it owns the cash in the vaults of the treasury. What is meant is that conservation of important social resources requires regulation of the use of *res communes* to eliminate friction and prevent waste. . . . Our modern way of putting it is only an incident of the nineteenth-century dogma that everything must be owned.

120. Sax, *supra* note 115.

121. Endangered Species Act, 16 U.S.C. §§ 1531–1543 (1976 & Supp. 1979).

122. Marine Mammal Protection Act, 16 U.S.C. §§ 1361–1407 (1976) as amended Oct. 9, 1981, Pub. L. No. 97-58, 95 Stat. 979.

123. *E.g.*, the National Park System Act of 1916, 16 U.S.C. §§ 1–18f (1976) as amended Act Nov. 10, 1978, Pub. L. No. 97-38, 95 Stat. 979. Also, in Knight v. United Land Ass'n, 142 U.S. 161, 181 (1891), the Supreme Court declared that the Department of the Interior holds public lands in trust for the benefit of all U.S. citizens:

ernment's duty to manage living natural resources wisely. Public trust language also appears in the National Environmental Policy Act,[125] which requires government to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations" so to "attain the widest range of beneficial uses of the environment without degradation."[126] Laws containing similar public trust language exist in 15 states with environmental impact review requirements similar to those found in NEPA,[127] and 13 states with special regulatory systems to protect fragile natural areas including the coastal zone.[128] While judicially enforceable duties under these statutes are often unclear,[129] this large body of state and federal legislation clearly mandates that the public interest in resource protection be taken into account.

One can also view the statutory language of the FCMA in the context of the public trust doctrine. The Act's assertion of jurisdiction over living marine resources was prompted by the need to conserve fish stocks for public benefit.[130] The FCMA therefore codifies a series of sustained yield management principles designed to promote the domestic commercial and recreational fishing industry under sound conservation and management notions.

The use of terms such as optimum yield and maximum sustainable yield in a formal, statutory context raises important questions about the impact of natural and man-made environmental fluctuations on successful

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> The Secretary is the guardian of the people of the United States . . . The obligations of his oath of office oblige him to see that the law is carried out, and that none of the public domain is wasted or is disposed of to a party not entitled to it.

Accord, Utah Power & Light v. United States, 243 U.S. 389, 409 (1916). The courts have also been willing to interpret the National Park System Act of 1916 when considering later more specific legislation. *See, e.g.,* Sierra Club v. Dep't of Interior, 376 F. Supp. 90 (N.D. Cal. 1974), *further proc.,* 398 F. Supp. 284 (N.D. Cal. 1975), 424 F. Supp. 172 (N.D. Cal. 1976). The FCMA is arguably an organic statute establishing comprehensive federal fishery management authority over the living resources of the Fishery Conservation Zone for the first time. Thus, the broad public trust concepts found in the FCMA could also have later, more specific applications.

124. The Act establishing the National Forest System, Organic Act, 16 U.S.C. §§ 471–541(h) (1976), also contains broad public trust language similar to that found in the FCMA. As with National Parks, the courts have applied these broad principles when examining later, more specific legislation. *See,* W.Va. Div. Izaak Walton League v. Butz, 522 F.2d 945 (4th Cir. 1975).

125. 42 U.S.C. §§ 4321–4347 (1970).

126. *Id.* §§ 4331(b)(1) & (b)(3).

127. For a list of state "SEPA's" *see* COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY—1979, TENTH ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY, Table 10-3, at 595–99 (1979), (hereinafter cited as CEQ). Note, *e.g.,* the California Environmental Quality Act, as amended, Cal. Publ. Res. Code, Secs. 2100–21176, which declares a statewide policy of "prevent[ing] the elimination of fish or wildlife species due to man's activities, [and] insur[ing] that fish and wildlife populations do not drop below self-perpetrating levels. . . ." *Id.* § 21011(i).

128. CEQ, *supra* note 127, at Table 10-3, 599–602.

129. *See* W. H. RODGERS, HANDBOOK ON ENVIRONMENTAL LAW § 7.3 717 (1977).

130. LEGISLATIVE HISTORY, *supra* note 51, at 1094–95.

implementation of the FCMA. Linkage between implementation of the Act, the protection of marine fish habitat, and the activities of the several federal agencies which manage marine resources, may thus require a shift in the burden of proof in resolution of multiple use disputes involving fisheries and other forms of exploitation, such as offshore oil and gas development.

2. *Changing Relationships Between Federal Agencies*

The establishment of the 197-mile wide Fishery Conservation Zone and the creation of a new, complex institutional framework to manage fisheries alters the role of the several federal agencies that manage marine resources. The new recognition given marine fisheries by passage of the FCMA creates tension between those charged with implementing the Act (NOAA and the regional councils) and state and federal agencies which control more traditional government interests such as navigation and energy development. Thus, in the six years since passage of the FCMA, there have been repeated sharp conflicts between fishing interests and proponents of offshore oil and gas development,[131] deep water ports, and energy facilities[132] over the multiple-use of critical marine habitats. Throughout this period, the duties and responsibilities of the other federal agencies involved in marine resource exploitation have remained unclear with respect to protection of fisheries.

In the case of offshore oil and gas development on Georges Bank, off the coast of Massachusetts, the Interior Department claimed that passage of the FCMA did not necessarily imply a federal duty to protect fisheries.[133] The response of the Court of Appeals for the First Circuit recognizes the current paradox in the relations between the federal agencies that manage marine resources:

> The Fishery [Conservation and Management] Act is thus no less an assertion of (a) federal interest in conserving the fishery resources . . . of the Outer Continental Shelf than was the earlier Outer Continental Shelf Lands Act [governing oil and gas development] an assertion of the federal interest in developing the oil and gas wealth of the . . . same area. To give effect to both policies, both Acts have to be construed in such a way so as to minimize any conflict. A construction allowing oil and gas exploitation to take absolute priority over fishing would be to sanction a schizophrenic national policy, in

131. *See infra* text accompanying notes 202–208.

132. *See infra* text accompanying notes 197–202.

133. Commonwealth of Massachusetts v. Andrus, 594 F.2d 872 (1st Cir. 1979), *on remand*, 481 F. Supp. 685 (D. Mass.), *aff'd*. 623 F.2d 712 (1st Cir. 1979).

> which one hand was busily at work undoing what the other was seeking to accomplish.[134]

Agreeing that the FCMA was tantamount to a new federal policy on the importance of fisheries, the court stated that the Secretary of the Interior had a duty to balance competing interests, formally recognizing the changing federal role in exploitation of the resources of the Outer Continental Shelf for the first time.[135]

II. IMPLEMENTATION OF THE FCMA

A. Overview

Public decision making hopefully involves careful consideration of competing interests—if all goes well, decision makers will strike a balance that best serves the public interest. In the case of marine fisheries, striking this balance requires consideration of two related issues. First, the public interest in a steady supply of fish at an affordable price must be balanced against the economic need of the fishing industry to make a profit. Thus, any review of implementation of the FCMA must examine the practical application of the conservation aspects of the Act in day to day fisheries management. A second issue concerns the public interest in successful promotion of the U.S. fishing industry as envisioned by the FCMA. A major factor in this second area is the successful resolution of conflicts between fisheries and other forms of marine resource development in critical fish habitat areas.

This section examines both aspects of the implementation of the FCMA, that is, the ability of the regional councils and NOAA to implement the conservation aspects of the FCMA[136] and, more importantly, application of the sustained yield management provisions of the FCMA to the protection of marine habitat. Since considerable confusion exists over linkage between successful implementation of the FCMA and habitat protection, this paper proposes three types of critical fish habitats in need of protection, and then reviews the ability of existing institutional mechanisms to identify and protect these habitat areas. Finally, the paper concludes with suggestions for change in the current federal interagency coordination process in light of the FCMA's mandate to promote and protect fisheries.

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134. *Id.* at 891.

135. *Id.*

136. *See infra* text accompanying notes 137–150. For a more detailed analysis of the conservation aspects of the FCMA as they apply to fisheries management, *see generally* Warner, Finamore, & Bean, *supra* note 15.

B. *Conservation Aspects of the FCMA Applied to Fisheries Management*

Expansion of the fishing industry and promotion of "sound conservation and management principles"[137] in the post-FCMA era have not been easy. Considerable confusion exists over the goals and objectives of the Act. While the original statute established a national fishery management program and limited foreign fishing, Congress has passed corrective amendments three times in the last six years. The 1976 statute did not detail federal policy on joint ventures between U.S. and foreign investors in the Fishery Conservation Zone (FCZ). In addition, the statute failed to define the role of the Act in protecting and promoting the domestic fish processing industry, and the precise relationship between the eight Regional Fishery Management Councils, the states, and NOAA. Corrective legislation has been either proposed or passed[138] in response to these and other issues since 1976.

Administration of the Act has also been difficult. Several fishery management plans created by the councils and approved by NOAA have required repeated amendments in response to unforeseen problems.[139] Institutional mechanisms to implement the Act have also proven time-consuming and cumbersome. Despite these problems, however, the total domestic catch, including catches from within the FCZ, set an all time high record in each of the four years immediately following establishment of the zone in 1977.[140] The U.S. catch within the FCZ also increased in three of the four years following creation of the zone; U.S. vessels caught a record 2 billion pounds of fish in the FCZ in 1980.[141]

Implementation of the conservation aspects of the FCMA has been sporadic and overshadowed by jurisdictional disputes. Adaptation to the Act's complex, and sometimes contradictory, management program has been difficult for the fishing industry, which was not tightly regulated in the past. All too frequently, long term, conservation oriented planning

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137. 16 U.S.C. § 1801(b)(3) (1976).

138. Pub. L. No. 95-6, 91 Stat. 14 (1977) addressed the issue of joint ventures; An Act of Aug. 28, 1978, Pub. L. No. 95-354, 92 Stat. 59 and An Act of Dec. 22, 1980, Pub. L. No. 96-561, 94 Stat. 3275 addressed foreign fishing, the role of U.S. processors and other similar issues. Several key members of Congress and fishing industry trade publications have also repeatedly called for refinements in the institutional relationship between NOAA, the states, and the Regional Fishery Management Councils.

139. *See infra* note 148 for a discussion of problems associated with the fishery management plan for Atlantic groundfish.

140. NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEP'T OF COMMERCE, CURRENT FISHERIES STATISTICS, FISHERIES OF THE UNITED STATES, Nos. 7200 (1977), 7500 (1978), 7800 (1979), 8000 (1980), 8100 (1981).

141. *Id.* No. 8100 at iii.

has been displaced by the need to resolve pressing, short-term, economic problems in the industry.[142] NOAA and the councils have also had persistent problems with establishing a workable definition for many of the terms used in the seven national standards, in particular the precise meaning of optimum yield.

The many changes in the Fishery Management Plan (FMP) for New England groundfish illustrate the evolution of the conservation aspects of fishery management under the FCMA. Rapid depletion of cod, haddock, and yellowtail flounder stocks off New England was one of the driving forces behind congressional support for FCMA in 1976[143] and a FMP for Atlantic groundfish was one of the first approved after passage of the Act.[144] Following that approval, groundfish quotas were changed five times within a three year period[145] and the FMP has been amended over thirty times in response to changing short-term economic pressures and revised biological assessments.[146] Strong demand and high prices in the late 1970's prompted a rapid rise in the number and efficiency of groundfish vessels in the New England fleet, overwhelming the FMP's attempts to enforce long-term conservation measures.[147] As NOAA and the New England Council struggled to develop a workable plan, management strategies shifted from area wide quotas to controls over fishing effort, gear limitations, and closure of critical spawning areas to fishing.[148]

142. *See* Warner, Finamore and Bean, *supra* note 15, at 49–59.

143. LEGISLATIVE HISTORY, *supra* note 51, at 263, 572–73, 959.

144. The Atlantic Groundfish FMP was approved by the Secretary of Commerce on March 14, 1977, two weeks after establishment of the 197-mile wide FCZ. 42 Fed. Reg. 13998 (1977).

145. U.S. GOVERNMENT ACCOUNTING OFFICE, PROGRESS AND PROBLEMS OF FISHERIES MANAGEMENT UNDER THE FISHERY CONSERVATION AND MANAGEMENT ACT 84 (1979) (report by the Comptroller General of the United States to the House Committee on Merchant Marine and Fisheries and its subcommittee on Fisheries and Wildlife Conservation and the Environment) [hereinafter cited as U.S. GAO].

146. Personal communication, Office of Public Affairs, National Oceanic and Atmospheric Administration, U.S. Dep't of Commerce, Washington, D.C., Aug. 18, 1981.

147. Sullivan, *Bureaucratic Red Tape Stifles FCMA's Effectiveness . . . New Englanders Want Action*, 61 NAT'L FISHERMAN 29 (March 1981).

148. In a preliminary FMP, NOAA proposed limitations on the mesh size of nets and closure of spawning areas. *Id.* Following the pattern of other FMP's, however, quotas limiting the size of the catch by area and type of vessel were developed for the final version of the Groundfish FMP. Atlantic Groundfish Plan, 42 Fed. Reg. 13998 (1977). Within eleven weeks of promulgation of emergency regulations implementing these quotas, domestic fishermen exceeded the entire 1977 quota for cod in the Gulf of Maine and the fishery was closed. *Id.* at 14077. The political uproar that followed led to constant tinkering with quotas, raising serious questions over the validity of the biological groundfish stock assessments upon which the quotas depend. U.S. GAO, *supra* note 145, at 74–84. In several instances the Secretary of Commerce declared an "economic emergency" permitting an increase in quotas without completion of the public comment process. *See, e.g.*, FMP for Atlantic Groundfish, 42 Fed. Reg. 58412 (1977). Eventually, the New England Council voted to return to control of mesh sizes and closure of critical spawning areas while considering long-term proposals to limit fishing effort. Sullivan, *supra* note 147. Throughout this period, Council members and the industry continually complained about NOAA's complex approval process and the length of time needed to promulgate regulations. *Id.*

A major factor in the confusion surrounding the Atlantic groundfish FMP was near total disagreement among the groups involved on the goals and objectives of the FCMA.[149] Clearly, the general lack of long-term planning and the *ad hoc* nature of many management decisions for this fishery indicate difficulty in implementing the concept of "a buffer in favor of the resource"[150] envisioned by congressional draftees of the FCMA's national standards. Despite these problems, cod and haddock stocks off New England have increased and the groundfish catch has climbed. In fact, possible oversupply with a resulting decline in price, rather than overly stringent conservation measures, appears to be a major problem in this fishery today. The fact that NOAA and the New England Council are moving towards increased use of area closures in groundfish management raises the spector of the "schizophrenic national policy" mentioned above. Conceivably fishermen will be barred from critical habitat areas to encourage restoration of stocks while other equally damaging forms of exploitation in the area continue.

C. *Conservation Aspects of the FCMA Applied to Protection of Marine Habitats*

The FCMA establishes exclusive U.S. control over the 197-mile wide Fishery Conservation Zone and directs the management of living resources within that area. Unlike Title III of the Marine Protection, Research and Sanctuaries Act (as amended),[151] the FCMA does not contain administrative procedures for identifying and protecting ocean areas important to the fishing industry. Nor does the FCMA create new institutional mechanisms for NOAA and the Regional Fishery Management Councils to use in resolution of multiple-use disputes affecting critical fish habitat.[152] Instead, the Act formally claims exclusive jurisdiction over a major natural resource and establishes a broad and legally binding management system with a strong conservation emphasis. Under the public trust doctrine, NOAA and the other state and federal agencies that manage marine resources have a duty to protect and enhance the resource claimed by the FCMA. When combined with the specific management requirements found in the national standards, this responsibility provides a powerful argument for the protection of certain types of critical marine habitats.

149. Warner, Finamore and Bean, *supra* note 15, at 53.

150. LEGISLATIVE HISTORY, *supra* note 51, at 687.

151. Pub. L. No. 92-532, 16 U.S.C. §§ 1431–1434, amended Aug. 29, 1980, Pub. L. No. 96-332, 94 Stat. 1059, and Dec. 26, 1981, Pub. L. No. 97-109, 95 Stat. 512.

152. The Fish and Wildlife Coordination Act and the National Environmental Policy Act are the two primary federal coordination statutes designed to resolve multiple-use conflicts over marine habitat. See *infra* text accompanying notes 170–197.

1. Habitats directly linked to recruitment

Recruitment is the key variable in virtually all calculations of the maximum sustainable yield of a fish stock. Thus protecting areas where spawning occurs, juvenile feeding grounds, and offshore zones with high concentrations of fish eggs and larvae is important in minimizing natural and man-made variables affecting recruitment of young fish into the harvestable stock. Often, spawning and nursery areas for many valuable fish species occur within relatively well defined portions of the FCZ, the territorial sea, and bays and estuaries.[153] The importance of a particular site may vary with the geographic distribution of a fish species. If a species is divided into separate sub-populations or stocks, a drop in spawning success at a particular site could cause a major disruption in recruitment for that sub-population. Delineation of key habitats for such a sub-population is difficult as the spatial aspect of environmental variables such as water temperature is hard to define and the precise location and relative importance of spawning, nursery, and feeding areas may vary from year to year. In short, delineation of habitats directly linked to recruitment often requires detailed biologic and oceanographic information and a liberal interpretation of the boundaries of a specific area.

The size of such habitats and ease of delineation will vary depending on the species and environmental variables involved. For shellfish species such as the blue claw crab, surf clams, and oysters and anadromous species such as Pacific salmon and the striped bass, linking specific habitat to recruitment is relatively straightforward. For other species, however, precise delineation of the habitat is difficult, as physical and chemical variations in the marine environment cause spawning, nursery, and feeding areas to shift.

Examples of conflict over marine areas critical to recruitment include a plan to isolate leaking oil tankers in a small bay near the Port of Valdez, Alaska, thereby threatening a salmon spawning stream, and unregulated dumping by Norfolk, Virginia, colliers anchored adjacent to key blue claw crab spawning grounds in Chesapeake Bay while waiting to load coal.[154] With respect to areas further offshore, recent debate over oil and

153. J. CLARK, COASTAL ECOSYSTEMS ECOLOGICAL CONSIDERATIONS FOR MANAGEMENT OF THE COASTAL ZONE 26–29, 59–86. Often spawning and nursery areas of commercially important fish species will overlap. For example, the total area of Georges Bank, a portion of the Outer Continental Shelf off Massachusetts, is approximately 10,000 square miles. Haddock spawn over approximately 6,300 square miles of this area, cod spawn in an overlapping region 3,500 square miles in size, and red hake spawn in a 3,500 square mile area. U.S. DEP'T OF INTERIOR, BUREAU OF LAND MANAGEMENT, SECRETARIAL ISSUE DOCUMENT OCS SALE NO. 42 GEORGES BANK, 46 (1979) [hereinafter cited as U.S. DEP'T OF INTERIOR]. Due in part to this high biological activity, the Georges Bank region provides a major portion of the groundfish catch of several New England states. *See infra* note 203.

154. Freye, *Foreign Colliers Clutter Va. Waters and Airways*, 62 NAT'L FISHERMAN 51 (May 1981).

gas development on Georges Bank[155] and the siting of an oil refinery in Eastport, Maine[156] has centered on the relative importance of adjacent spawning and nursery areas for high value fish species such as cod, haddock, and redfish.

2. *Critical fishing areas*

The objective of the FCMA is "to promote domestic, commercial and recreational fishing."[157] To meet this objective, fishermen must have realistic access to the resource. Habitats defined by the activities of the fishing fleet also require protection if the goals of the FCMA are to be met. The nets, pots, and other gear used in commercial fishing often have performance limitations and, while the geographic range of a species may be large, the area that can be actively fished is finite. Thus, for example, prime Gulf of Mexico shrimping grounds require a flat ocean bottom with few obstructions even though such areas do not necessarily contain the highest number of shrimp.[158] In addition to gear limitations, distance from port and the relative economic value of target species can constrain fishing operations and increase the importance of a particular fishing area. Delineation of critical fishing areas requires a thorough knowledge of the local commercial and recreational fishing industry; however, collection of necessary data can be difficult.[159]

Conflict over critical offshore fishing areas is increasing due to the accelerated pace of offshore oil and gas development. Many of the regions slated for intensive oil and gas leasing also support major foreign and domestic fisheries. Conflict between U.S. vessels and offshore development interests will increase as domestic boats replace foreign vessels now excluded by the FCMA. The economic value of these critical fishing areas is substantial. The 1979 sale of drilling rights on Georges Bank removed several key scallop and flounder fishing areas, conservatively valued at $1–25 million (ex-vessel value), from exploitation.[160] A simple economic calculation, however, may not be the best indicator of the value of a critical fishing area inasmuch as social as well as economic factors play a major role in the location of traditional fishing grounds.

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155. *See infra* text accompanying notes 202–208.

156. *See infra* text accompanying notes 197–202.

157. 16 U.S.C. § 1801(b)(3) (1976).

158. Personal communication with James Chambers, Office of Habitat Protection, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Washington, D.C. (Jan. 15, 1981).

159. BELL, *supra* note 3, at 50–64.

160. U.S. DEP'T OF INTERIOR, *supra* note 153, at 12. These dollar terms are expressed as the "ex-vessel" value of the commercial catch. The ex-vessel value represents the price paid to the fishermen when the catch is unloaded at the dock. It generally represents about 20–30% of the retail price for fish paid by the consumer.

3. Other critical habitats

There are many inshore and estuarine areas that play a central role in the marine food chains of high value fish species. For example, linkage between a tidal estuary and management of an offshore fishery under the FCMA may be indirect but not insignificant. Tidal estuaries directly and indirectly contribute to a portion of the life cycle of between 60 and 70 percent of all fish caught by U.S. commercial and sport fishermen.[161] Many of these critical habitats are already protected under other federal statutes; however, advent of the FCMA creates a powerful new argument for their protection.

In summary, the ability to establish a clear link between the sustained yield management concepts codified by the FCMA and protection of marine habitat can vary according to the characteristics of individual fish species. Linkage is clear for relatively immobile shellfish as they are easy to locate and the impact of, for example, the disposal of drilling muds from an offshore oil platform, is immediate and visible. The economic impact of the destruction of shellfish habitat is also relatively easy to quantify: nationally, closure of shellfish beds due to pollution costs the economy approximately $38 million in lost revenues each year.[162] Thus the fact that the United States harvests 45 percent of the world's total crab catch, 17 percent of the world's lobster catch, and 36 percent of the world's oyster catch is a powerful inducement to protect and enhance important shellfish areas.[163]

For other species, however, the link between habitat protection and economic development in the nation's fishing industry is less clear. Sublethal and synergistic impacts of man's activities, inadequate data, and an inability to precisely map spawning nursery areas can all frustrate habitat protection efforts. Given the conservation mandate of the FCMA, the public trust doctrine, and the need to avoid "schizophrenic" government policies, these uncertainties may require a shift in the burden of proof in federal agency decision making to favor the fishing industry and protection of marine habitat.

D. Institutional Response to the FCMA on Habitat Protection Issues

Passage of the FCMA places new strains on the institutional mechanisms that govern traditional federal ocean development interests. The various statutes, regulations, and international agreements that govern fisheries and other marine activities divide into four groups: 1) regulation

161. CLARK, *supra* note 153, at 26.

162. BELL, *supra* note 3, at 216 (1975 data).

163. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, 1978 YEARBOOK OF FISHERY STATISTICS CATCHES AND LANDINGS 139–44, 154–55 (1979) (1978 data).

of the taking of particular species;[164] 2) acquisition and management of key marine habitats,[165] including comprehensive planning;[166] 3) management and exploitation of minerals, fish, and shellfish;[167] and 4) mandatory consideration of fish and wildlife impacts.[168] Federal statutes in this last category are central to the resolution of multiple-use conflicts in marine habitat areas.[169]

1. The Fish and Wildlife Coordination Act (FWCA)

The FWCA[170] is the only federal statute that specifically mandates consideration of fish and wildlife issues in the federal decision making process.[171] The Act has two substantive provisions. First, all federal agencies contemplating actions that could affect wildlife are required to consult with the government agency with the relevant expertise and regulatory authority.[172] This consultation requirement covers federal permits and other government activities including the construction of water resource projects.[173] The second part of the FWCA requires that federal agencies mitigate destruction or alteration of fish and wildlife habitat.[174] This pro-

164. *See, e.g.*, the Endangered Species Act, 16 U.S.C. §§ 1451–64, and the Marine Mammal Protection Act, 16 U.S.C. §§ 1361–1407 (1982).

165. The Marine Sanctuaries Act, 16 U.S.C. §§ 1431–1434, is an example of federal management of key marine habitat.

166. The primary federal statute requiring comprehensive management in the coastal zone is the Coastal Zone Management Act, 16 U.S.C. §§ 1451–1464, and the Outer Continental Shelf Act, 43 U.S.C. §§ 1331–43.

167. *See, e.g.*, the FCMA and the Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331–43 (1976).

168. 16 U.S.C. § 661 (1976).

169. The requirement that federal agencies take fish and wildlife issues into consideration is also, however, implicitly stated in several other statutes. For example, the Federal Water Pollution Control Act as amended (the "Clean Water Act") has as its primary goal a level of water quality which ". . . provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water." 33 U.S.C. § 1251(a)(2) (1980). This "fishable-swimable" requirement forms the basis for effluent limitations and water quality standards and the regulation of dredge and fill material under other sections of the Act. The Clean Water Act is not, however, intended primarily to foster interagency coordination and to set national policy on fish and wildlife issues. Similar, although less specific, mention of the importance of protecting key fish and wildlife habitat also exists in the Coastal Zone Management Act and the Outer Continental Shelf Land Act Amendments of 1978. For a discussion of the history and trends in federal consideration of fish and wildlife issues *see* BEAN, THE EVOLUTION OF NATIONAL WILDLIFE LAW, U.S. COUNCIL ON ENVIRONMENTAL QUALITY, WASHINGTON, D.C. 192–233 (1977).

170. 16 U.S.C. §§ 661–668 (1976).

171. The FWCA defines wildlife as "birds, fishes, mammals, and all other classes of wild animals and all types of aquatic and land vegetation upon which wildlife is dependent." *Id.* § 666(b).

172. *Id.* § 662(a). The federal agency proposing a project "shall give full consideration to the report and recommendations of the Secretary of the Interior (or NOAA/NMFS) . . . on the wildlife aspects of such projects, and the project plan shall include such justifiable means and measures for wildlife purposes as the reporting agency finds should be adopted to obtain maximum overall project benefits." *Id.* § 662(b).

173. *Id.* § 662(a).

174. *Id.* § 663.

vision generally applies to federal water resource development projects such as dams, diversions, and channelization. While this portion of the FWCA can be important in the coastal zone, it will not be considered in detail here.

The relative weight courts and administrative agencies have given to the FWCA consultation requirement has varied over the years. The FWCA, originally enacted in 1934,[175] was substantially amended in 1946[176] and 1958.[177] In the first version of the statute, the mandatory consultation requirement was limited to the installation of fish ladders, and considerable doubt existed as to whether even this provision was binding.[178] The 1946 amendments clarified the nature of the Act's consultation requirement but left open the question of the relative weight federal agencies must give to various factors when examining impacts on wildlife. The 1958 amendments finally resolved the issue by requiring that wildlife values be given "equal consideration" with other aspects of water resource development.

Still unclear, however, is the weight to be given wildlife issues in federal activities beyond the scope of the FWCA, such as dredge and fill permits and the leasing of offshore areas for oil and gas development.[179] At least one early court decision interpreting the 1958 amendments clearly established that "compliance with the Act could not be accomplished perfunctorily."[180] Later decisions, however, made light of the FWCA consultation requirement as passage of the National Environmental Policy Act in 1969 created a broad, new, mechanism for interagency consultation which appeared to be more significant.[181]

In the day to day power politics of modern government, the FWCA consultation requirement is a weak mechanism by which to ensure sustainable yield from key fish stocks and to protect important marine habitats. The central problem is continued confusion over the FWCA's use of the term "equal consideration." While regulations governing the procedural aspects of federal agency compliance exist,[182] interpretation of the "equal consideration" clause is generally left to individual agencies. As a practical matter, government agencies reflect the views and interests of the constituent groups which they serve and only reluctantly consider extra-

175. Act of March 10, 1934, ch. 55, 48 Stat. 401 (1933–34).

176. Act of August 14, 1946, ch. 965, 60 Stat. 1080 (1946).

177. Act of August 12, 1958, PUB. L. NO. 85-624, 72 Stat. 563 (1958).

178. "[T]here is nothing but a spirit of cooperation which is insisted on in this bill. There is nothing mandatory about the bill." H.R. REP. No. 850, 73d Cong., 2d Sess. 1 (1934).

179. 16 U.S.C. § 661. Historical discussion adopted from BEAN, *supra* note 169, at 193–196.

180. Udall v. FPC, 387 U.S. 428 (1967), *quoted in* BEAN, *supra* note 169, at 198.

181. BEAN, *supra* note 169, at 199–209.

182. On May 28, 1979, NOAA and the Department of Interior jointly released proposed "Uniform Procedures for Compliance," 44 Fed. Reg. 29300–29359 (May 18, 1978).

neous matters.[183] The reluctance of many resource development agencies to take fish and wildlife issues into consideration under the FWCA's admittedly vague requirement of "equal consideration" has been a major stumbling block in successful implementation of this statute.[184]

In summary, the Act contains institutional mechanisms, such as the consultation requirement and the "equal consideration" provision, which require agencies to consider impacts on wildlife and to coordinate efforts to protect and enhance wildlife habitat. Such requirements cannot, however, dictate the outcome of the decision making process. Once an agency complies with these procedural requirements, it can proceed with proposals that have a clear, adverse impact on the sustainable yield concepts which are the basis of federal management of marine fisheries.

2. *The National Environmental Policy Act (NEPA)*

Although NEPA[185] is often called the "Sherman Anti-Trust Act of environmental law,"[186] the word "wildlife" is not even mentioned in the statute. NEPA established a broad national policy of "promot[ing] efforts which will prevent or eliminate damage to the environment, . . ."[187] to "create and maintain conditions under which man and nature can exist in productive harmony."[188] NEPA's requirement that federal agencies prepare detailed environmental impact statements for all "proposals for legislation and other major federal actions significantly affecting the quality of the human environment"[189] creates a coordination mechanism exceeding the FWCA in scope and significance.

As with the Fish and Wildlife Coordination Act, NEPA requires that an agency making a major proposal "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved."[190] The procedures involved in preparing such impact statements are well known and a tremendous body of litigation, regulations, and published comment exists on the procedural aspects of NEPA. Little doubt exists that NEPA requires federal agencies and the courts to give a "hard look" at actions

183. Holden, *Imperialism in Bureaucracy,* AM. POL. SCI. REV. 943–51 (Dec. 1966).

184. HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT OF THE COMMITTEE ON MERCHANT MARINE AND FISHERIES, U.S. HOUSE OF REPRESENTATIVES, ON THE ADMINISTRATION OF THE FISH AND WILDLIFE COORDINATION ACT, Serial No. 95-55 at 44 (1978), Statement of Patrick Parentau, staff attorney, National Wildlife Federation. *See also* statement of James B. Tripp, staff attorney, Environmental Defense Fund. *Id.*

185. 42 U.S.C. §§ 4321–4347 (1970).

186. RODGERS, *supra* note 129, at 697.

187. 42 U.S.C. § 4321 (1976).

188. *Id.* § 4331(a).

189. *Id.* § 4332(c).

190. *Id.*

that will affect marine fisheries.[191] The "hard look" requirement seems to call for "strict adherence to procedural requirements, carefully explained decision making, and results not plainly indefensible."[192] Thus, how an agency makes its decision appears to be important and clearly specified under NEPA. NEPA's impact on what that decision may be is less clear, however, raising problems similar to those under the FWCA where an agency must give equal consideration to wildlife issues and then may be able to reject or ignore them.[193]

In determining whether a federal agency has complied with the spirit as well as the procedural aspects of NEPA, the courts generally try to ascertain if the agency performed its review in good faith and properly balanced environmental factors—that is, whether there was genuine consideration of environmental issues.[194] As long as due consideration is given to such issues, agencies have a considerable amount of discretion under NEPA.[195] It is therefore extremely difficult to translate the broad goals and objectives of the Act into a specific policy over fisheries with which agencies must comply. Thus, while NEPA requires extensive interagency consultation and coordination, it may have the same weakness as the Fish and Wildlife Coordination Act: once the impacts of a proposal on fisheries have been considered, it appears agencies can then reject or ignore those impacts.[196]

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191. The classic appplication of this "hard look" concept appears in Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402 (1971). *See* RODGERS, *supra* note 129, at 716–38, for a review of NEPA procedural requirements.

192. RODGERS, *supra* note 129, at 717.

193. An analysis of the substantive aspects of NEPA can be found in RODGERS, *supra* note 129, at § 7.5.

194. "This chapter (NEPA) is essentially procedural with the purpose of assuring that agencies will be fully aware of the impact of their decisions when they make them . . .; grudging, pro forma compliance will not do." Citizens Against Toxic Sprays, Inc. v. Bergland, 428 F. Supp. 908, 922 (D. Or. 1977).

195. RODGERS, *supra* note 129, at 744.

196. For a recent example of the de-emphasis given substantive aspects of NEPA, *see* Strycker's Bay Neighborhood Council v. Karlen, 444 U.S. 223 (1980):

> In *Vermont Yankee Nuclear Power Corps. vs. NRDS*, 435 U.S. 519, 558 (11 ERC 1439) (1978), we stated that NEPA, while establishing "significant substantive goals for the Nation," imposes upon agencies duties that are "essentially procedural." As we stressed in that case, NEPA was designed "to insure a fully-informed and well-considered decision," but not necessarily "a decision the judges of the Court of Appeals or of this Court would have reached had they been members of the decisionmaking unit of the agency." *Vermont Yankee* cuts sharply against the Court of Appeals' conclusion that an agency, in selecting a course of action, must elevate environmental concerns over other appropriate considerations. On the contrary, once an agency has made a decision subject to NEPA's procedural requirements, the only role for a court is to insure that the agency has considered the environmental consequences; it cannot "interject itself within the area of discretion of the executive as to the choice of the action to be taken." Kleppe v. Sierra Club, 427 U.S. 390,

3. Two Examples of the Application of NEPA and the FWCA

The press to exploit the living and nonliving resources of the Fishery Conservation Zone and the Outer Continental Shelf is straining the federal coordination mechanisms found in the FWCA and NEPA to their outermost limits. Since neither statute requires more than consideration of fish and wildlife impacts, their success in upholding the sustained yield management concepts mandated by the FWCA is often limited. Two recent interagency disputes over key fish habitat off the coast of Massachusetts and in Chesapeake Bay demonstrate this inability to protect the FCMA's goals and objectives.

On November 28, 1978, the Chief of the U.S. Army Corps of Engineers issued a dredge and fill permit for construction of a marine terminal and oil refinery on the Elizabeth River in Portsmouth, Virginia.[197] The decision ended a formal review and analysis process on the part of seven different federal agencies,[198] which produced draft, final, and supplemental environmental impact statements and a special study of alternative east coast refinery sites.[199] All parties in this decision making process agreed that the primary environmental impact of the refinery was the probability of a major oil spill in Chesapeake Bay or the Elizabeth River by oil tankers. The lower bay is the prime spawning ground for the Chesapeake's famed blue claw crab and the Elizabeth River supports one of the largest oyster beds in the state of Virginia. Both areas provide spawning and feeding habitat for commercially important finfish and the fishing industry is a major economic force in the region.

By the time the Corps announced its decision, many of the consultation requirements of NEPA and the FWCA had been fulfilled.[200] Citing their responsibilities under the FWCA and NEPA's requirement to examine alternative courses of action, the agencies involved conducted a survey

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410, n. 21 (3 ERC 2169). *See also* FPC v. Transcontinental Gas Pipeline Corp., 423 U.S. 326 (1976) (footnote omitted).

Note, however, Justice Marshall's dissent ("Vermont Yankee does not stand for the broad proposition that the majority advances today . . ."). *Id.*

197. "United States Army Chief of Engineers OK's Portsmouth, Virginia, Refinery Permit." Department of the Army, Office of the Chief of Engineers, Washington, D.C., News Release No. 78-63 (November 28, 1978).

198. The Corps of Engineers, the Environmental Protection Agency (air and water pollution matters), the Fish and Wildlife Service (wildlife impacts), NOAA (fishery impacts), the Department of Energy (east coast oil supply impacts), the Coast Guard (navigation impacts and probability of oil spills from tankers entering Chesapeake Bay), and the Navy Department (impact on adjacent Navy bases).

199. "Hampton Roads Energy Company Permit Application Decision Paper." Dep't of the Army, Office of the Chief of Engineers (issued as an attachment to the Nov. 28, 1978 news release, *supra* note 197, at 5–9) [hereinafter cited as Corps of Engineers Decision paper].

200. "There are no legal, policy or procedural issues which restrain or dictate either issuance or denial" of the permit. Corps of Engineers Decision Paper, *supra* note 199 at 1.

of 67 potential refinery sites up and down the east coast, narrowing their choices to 19 sites, including the Elizabeth River at Portsmouth. In comparison with other sites, the Elizabeth River was considerably less favorable, leading a number of agencies to ask for denial of the permit because of concern over the impact of an oil spill on shellfish beds and other habitat.[201] Each agency expressed its concerns in comments on the Corps' Environmental Impact Statement and through a formal exchange of correspondence based on interagency memorandums implementing the FWCA. Given the procedural nature of existing federal coordinating statutes, however, the Corps was able to issue the permit even though publicly stating "there will be adverse impacts on fish and wildlife."[202]

The recent controversy over Georges Bank demonstrates a similar pattern of long, involved interagency consultation prior to a decision adversely affecting fisheries. The winds, currents, and shallow depth of that portion of the Outer Continental Shelf off Massachusetts known as Georges Bank make the area an extremely fertile fishing ground. Fisheries have been present on the Bank for over 300 years and the value of annual landings of cod, haddock, flounder, lobster, and other species approximates $168 million.[203] The U.S. Department of the Interior first announced the prospective sale of leases for oil and gas development on Georges Bank in December 1977,[204] touching off two years of almost continuous litigation, public hearings, and formal interagency consultation under NEPA and the FWCA. The primary concern was the high probability of oil spills within the circular current pattern found over the Bank. Even though the area to be leased was fairly small, oil could be carried by winds and currents throughout the Bank,[205] threatening the spawning and nursery areas of many commercial important fish species.

As in the case of the Portsmouth oil refinery, the Georges Bank controversy generated its share of environmental impact statements and other forms of interagency coordination. In fact, at one point two separate agency proceedings occurred simultaneously, with the Interior Department considering the impact of oil and gas development under NEPA, and NOAA considering designation of the Bank as a marine sanctuary.[206]

201. In issuing the permit, the Corps took exception to this view. *Id.* at 7, 10.

202. *Id.* at 2.

203. Finn, *Interagency Relationships in Marine Resource Conflicts: Some Lessons from Oil and Gas Leasing*, 4 HARV. ENVTL. L. REV. 366–67, n. 50 (1980). Rhode Island's offshore fishing fleet obtains 45% of the value of its annual catch from the Georges Bank area. *See* OFFICE OF COASTAL ZONE MANAGEMENT, STATE OF RHODE ISLAND COASTAL ZONE MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT, NAT'L OCEANIC AND ATMOSPHERIC ADMIN., U.S. DEP'T OF COMMERCE, Table II-2 (March 1978).

204. North Atlantic Outer Continental Shelf, 42 Fed. Reg. 65285–65290 (1977).

205. Finn, *supra* note 203.

206. 44 Fed. Reg. 47132 (1979).

Throughout this period opponents of the lease sale (including seven New England fishing industry groups and the Commonwealth of Massachusetts) insisted that passage of the FCMA implied a federal duty to protect fisheries. While not necessarily agreeing with this claim, the U.S. Court of Appeals for the First Circuit in *Commonwealth of Massachusetts v. Andrus* noted the conflict between federal promotion of the fishing industry and promotion of offshore oil and gas development.[207] The court envisoned the specter of a ". . . schizophrenic national policy, in which one hand was busily at work undoing what the other was seeking to accomplish."[208] Such a specter increases the need to understand the link between fish habitat protection and successful implementation of the FCMA.

III. CONCLUSION

A. Summary

Over the last several years, politicians have been advocating the use of the United States "food weapon" to shape relations with foreign nations. In the case of fisheries, this political tool is already in use. One of President Carter's first actions after the Soviet Union's invasion of Afghanistan was closure of the U.S. Fishery Conservation Zone to all Soviet fishing vessels.[209] As the U.S. fishing industry expands in the post-FCMA era, the role of fish exports and the 197-mile wide zone in international trade and politics will undoubtedly increase.

The importance of the U.S. fishing industry is on the rise within the United States as well. Per capita consumption of fresh and frozen fish products is slowly increasing[210] and the industry has many opportunities to take over domestic markets now dominated by imports. The political clout of the fishing industry is rising as a result of the FCMA: a major factor in the opposition of coastal states to the Reagan Administration's accelerated offshore oil and gas leasing program has been a concern over the future of this newly resurgent industry. Thus a clear understanding of the role of the FCMA as it applies to the protection of critical marine habitat is timely.

The thrust of this article has been to define the conservation aspects of the FCMA as they apply to fisheries management and protection of marine habitat. This review suggests three broad conclusions:

1. The FCMA has a strong conservation orientation as shown by the language of the Act itself and by the doctrine of public trust which governs federal management of natural resources.

207. *See supra* note 133, at 891.
208. *Id.*
209. *State of the Union message*, N.Y. TIMES, Jan. 24, 1980, at A12, col. 2.
210. NAT'L MARINE FISH SERV. No. 8100, *supra* note 1, at 88–92.

2. Successful implementation of the FCMA is at least partially dependent upon protection of marine habitats that can be linked to the sustained yield management principles codified by the Act.
3. Existing federal interagency coordination mechanisms do not necessarily reflect the needs of sustained yield management as mandated by the FCMA. The inability of these institutional mechanisms to protect the objectives of the FCMA could lead to the "schizophrenic national policy" envisioned by the court in *Commonwealth of Massachusetts v. Andrus*.[211]

B. Delineation of Critical Marine Fish Habitat

Linking the success of the FCMA to the protection of critical fish habitat increases the importance of existing techniques to delineate fish spawning and nursery areas and prime fishing grounds. While several mechanisms exist for regulating exploitation of living and nonliving resources within key marine habitat areas,[212] an accepted methodology for

211. *See supra* note 133, at 891.

212. Provisions of several federal statutes speak to regulation of development within critical marine fish habitat areas. *E.g.*, Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. 1431, authorizes the Secretary of Commerce to designate portions of the three-mile wide territorial sea and the 197-mile wide Fishery Conservation Zone as marine sanctuaries. The purpose of this statute is to preserve or restore such areas "for their conservation, recreational, ecological, or esthetic values." *Id.* Criteria for the selection of a marine sanctuary can include "a marine ecosystem of exceptional richness indicated by the abundance and variety of marine species . . ." and "habitat on which one or more commercially or recreationally valuable marine species depends . . ." 15 C.F.R. §§ 922.21(a)(2) and (3). Section 101(13) of the Outer Continental Shelf Lands Act as amended, 43 U.S.C. § 1801(13) requires that the federal government ". . . assume responsibility for the minimization or elimination of any conflict . . ." associated with the development of offshore oil and gas resources. To meet this responsibility, the Secretary of the Interior is required to create a five year leasing program that takes into account "the relative environmental sensitivity and marine productivity of different areas . . .," *Id.* § 1344(2)(g), and establish regulations for withdrawing and terminating leases when fish and shellfish resources are threatened. *Id.* §§ 1334(a)(1) and 2(A)(i). The FCMA also permits NOAA and the councils to limit fishing activity in key spawning and nursery areas for management purposes. 16 U.S.C. § 1853(b). Several international treaties permit the federal government to protect environmentally sensitive areas as well. U.S. GOVERNMENT ACCOUNTING OFFICE, MARINE SANCTUARIES PROGRAM OFFERS ENVIRONMENTAL PROTECTION AND BENEFITS OTHER LAWS DO NOT 24 (1981) (report by the Comptroller General of the United States to the Committee on Merchant Marine and Fisheries, Subcommittee on Fisheries and Wildlife Conservation and the Environment, U.S. House of Representatives) [hereafter cited as U.S. GAO Report].

While each of these federal statutes contain provisions for delineating and managing such areas, they do not clearly establish procedures for identifying an area and resolving conflict between fisheries and other forms of exploitation. For example, areas protected under the marine sanctuary program have been relatively small and associated with discrete physical features such as shipwrecks and coral reefs. Where prohibition of oil and gas development and other activities in biologically productive areas has been proposed, designation of a sanctuary generally meets strong congressional and industrial opposition. In the case of the Outer Continental Shelf Lands Act, as amended, it appears that the Secretary of the Interior cannot enforce environmental protection measures unless they directly relate to mineral leases. U.S. GAO Report at iii, 17. The management provisions of the FCMA are also limited to regulation of fishing activity. *Id.* Each of these statutes is designed to solve particular marine resource problems and none of them is specifically intended to protect and

identifying, delineating, and ranking such habitat areas is not yet available. The Office of Coastal Zone Management of the National Oceanic and Atmospheric Administration has, however, started to develop systematic techniques for identifying potential conflict over marine habitat on a macro level. This "strategic assessment program" has developed a series of maps of the distribution of major fish species for the eastern U.S. Outer Continental Shelf.[213] Overlay maps of water pollution from point sources, oil and gas development, shipping routes, and other parameters have been prepared and the general location of areas of potential conflict identified.[214] The results of this project can only be used for large, regional planning. Nevertheless, the available data is promising. Without question, however, a considerable amount of further work is needed before a generally accepted technique for delineating critical fish habitat is available. Such a technique is essential to linkage of habitat protection and implementation of the FCMA.

C. Institutional Changes

The decisions on the Portsmouth oil refinery and the Georges Bank lease sale occurred in the middle of an intense debate over national energy policy. In both cases, administrative proceedings conducted prior to the final decision revealed substantial and unusually well documented conflicts between the agencies proposing the action and the domestic fishing industry. Yet neither NEPA nor the FWCA significantly altered the final outcome of either controversy, although both acts are designed to assure orderly consideration of fish and wildlife issues and to create a process for resolving natural resource conflicts. In both instances the interagency consultation process revealed that the proposed projects had a high probability of threatening key habitat essential to implementation of sustained yield fishery management principles. Nonetheless, despite the existence of NEPA, the FWCA, and passage of the FCMA, neither the fishing industry nor NOAA were able to substantially alter the decisions.

To succeed, the fundamental principles of marine fish management embodied in the FCMA depend upon healthy, highly reproductive fish stocks. If the management schemes mandated by the FCMA are to be meaningful, an additional institutional mechanism is needed when a direct

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restore marine fish habitat. These differing objectives can influence the priorities of the agencies involved and the rationale for designating critical habitat areas. *See e.g.*, Mass. v. Andrus, 594 F.2d 872, 885 (1st Cir. 1979).

213. G. CARLTON RAY, M. G. RAY, J. A. DOBBIN, C. N. EHLER, & D. J. BASTA, EASTERN UNITED STATES COASTAL AND OCEAN ZONES DATA ATLAS, U.S. COUNCIL ON ENVTL. QUALITY AND OFFICE OF COASTAL ZONE MANAGEMENT, NAT'L OCEANIC AND ATMOSPHERIC ADMIN., U.S. DEP'T OF COMMERCE (August 1980).

214. *Id.* at 1.

conflict occurs between fisheries development and other uses of the marine environment. The current mechanisms found in NEPA and the FWCA are effective in assuring early and substantial consideration of wildlife impacts. Both statutes, however, are largely procedural in nature and the mandate of the FCMA may require a shift in these coordination mechanisms. As a practical matter, such a shift cannot radically alter existing statutory division of authority over marine resources.

One remedy would be to create a system of checks and balances modeled on the existing scheme governing issuance of permits by the U.S. Army Corps of Engineers for the disposal of dredged materials in inland waters and the territorial sea. Section 404c of the Federal Water Pollution Control Act[215] gives the U.S. Environmental Protection Agency (EPA) the right to withdraw proposed dredge spoil sites from consideration by the Corps if the spoil "will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas." This provision is, in effect, a veto power given to the EPA. In the exercise of that power, however, the agency is restrained by requirements for hearings, public comment and early communication between EPA and the Corps.[216] The agencies involved view 404c as a last resort, and this veto has never actually been used to block issuance of a permit. The specter of an EPA veto has, however, encouraged the Corps and EPA to remodel the dredge and fill permit program and the interagency consultation process so as to identify and resolve issues quickly. The provisions of 404c assure that EPA's concerns are, in fact, incorporated into the Corps' final decision. Thus the EPA, with its specific expertise and its mandate to protect resources, is involved in all aspects of even the most controversial permit decisions.

A similar procedure for marine fisheries was proposed by the Secretary of Commerce during the Ford Administration. The proposed "National Plan for Marine Fisheries," released shortly after the FCMA was passed, included provisions to amend the Fish and Wildlife Coordination Act to strengthen existing habitat identification and protection provisions.[217] This national fisheries plan also presented detailed proposals for improved state/federal coordination, mitigation for lost habitats, and a strengthened marine sanctuary program.[218] Given the strong links between successful implementation of the FCMA and protection of marine fish habitat, adoption of such a program would be timely.

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215. 33 U.S.C. § 1344(c).

216. 40 C.F.R. 231 44 Fed. Reg. 58082–58085.

217. U.S. DEP'T OF COMMERCE, A MARINE FISHERIES PROGRAM FOR THE NATION 6 (July 1976).

218. *Id.* at 39–41.