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MARICULTURE IN OFFSHORE CRITICAL HABITAT AREAS: A CASE STUDY OF STELLWAGEN BANK NATIONAL MARINE SANCTUARY*

*Bradley W. Barr***

I. INTRODUCTION

Recognizing that the ocean is not a uniform environment, but a highly heterogeneous patchwork of different habitats, bottom types, physical features and varying water column complexities, it follows that some of these areas are more important toward specie survival and long term success. Such areas are called "essential habitats," which are "geographically or physically distinct areas that one or more species finds indispensable for its survival at some phase in its life history."[1] Arguably, it is difficult to identify such areas given the state of our knowledge of oceanic environments at ecologically-significant scales. It is this uncertainty, in part, that spawns some of the controversy regarding the impact on essential marine habitat by mariculture activities.

One of the interesting aspects of a federal marine regulatory system is that when a controversy arises in a specific area, its implications may be felt on a national scale. To deal with such controversy, particularly with regard to the National Marine Sanctuary Program,[2] the prudent

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* In 1996, the Stellwagen Bank National Marine Sanctuary was redesignated as the Gerry E. Studds Stellwagen Bank National Marine Sanctuary. National Marine Sanctuaries Preservation Act, Pub. L. No. 104-283, § 11, 110 Stat. 3363, 3369 (1996).

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1. Langton et al., *The Interface Between Fisheries Research and Habitat Management*, J. FISHERIES MGMT., Feb. 1996, at 3.

2. *See* Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. §§ 1431-1445a (1994). It is the purpose of the National Marine Sanctuaries Program to identify, designate, and manage marine areas of special national significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic

regulator must address the contested issue in a pragmatic way. This approach often fails to assist those initially involved in the controversy, however, it does provide direction for others that follow. Regulatory measures that incorporate public discussion, whereby all interested parties express their views on potential regulations, are effective to alleviate potential future conflicts. This method is especially effective with mariculture, where many different parties share conflicting views. This Commentary is designed to address these issues.

Part II of this Commentary discusses the present federal programs that identify and protect essential habitats within the Exclusive Economic Zone (EEZ),[3] and addresses how these habitats are affected by the Endangered Species Act (ESA),[4] the Magnuson Fishery Conservation and Management Act (Magnuson Act)[5] and the National Marine Sanctuary Program. Part III will concentrate on issues and proposals concerning essential habitat designations and mariculture activities within the Gerry E. Studds Stellwagen Bank National Marine Sanctuary. This Commentary then suggests that in order to provide compensation to the public for the private utilization of common resources within the EEZ for mariculture, lease programs must be developed.

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qualities. The Program seeks to provide enhanced resource protection through conservation and management of the sanctuaries that complements existing regulatory authorities; to support, promote, and coordinate scientific research and monitoring on specific sanctuary resources; to enhance public awareness, understanding, appreciation, and wise use of the marine environment; and to facilitate, to the extent compatible with the primary objective of resource protection, all public and private uses of the sanctuaries. *Id.* § 1431(a)-(b). The National Marine Sanctuary Program is administered by the Sanctuaries and Reserves Division of the National Oceanic and Atmospheric Administration.

3. The exclusive economic zone is the ocean area extending two hundred miles seaward of the United States territorial sea baseline. A coastal state has sovereign rights over the marine resources within the EEZ. 16 U.S.C. §§ 1801(6), 1811(a) (1994). *See generally* Bruce N. Shibles, *Implications of an International Legal Standard for Transboundary Management of Gulf of Maine-Georges Bank Fisheries Resources*, 1 OCEAN & COASTAL L.J. 1, 14 (994).

4. 16 U.S.C. §§ 1531-1544 (1994).

5. 16 U.S.C. §§ 1801-1882 (1994), *amended by* Sustainable Fisheries Act, Pub. L. No. 104-297, 110 Stat. 3559 (1996).

II. THE FEDERAL REGULATORY SCHEME FOR ESSENTIAL HABITAT IDENTIFICATION IN THE EEZ

A. Historical Difficulties Concerning Mariculture Activities in New England

The history of offshore mariculture in New England is short and controversial. Perhaps this is true of all new ideas in a conservative place like coastal New England, where the familiar and the known are valued commodities. However, as the remains of the harvesting sector compete for fewer and fewer fish, and with the outlook for the recovery of wild stocks decades away, the commercial fishing industry has changed forever.

In the short history of attempts to develop offshore mariculture in the region, the problematic issues most often cited regard potential conflicts with existing uses and potential environmental impacts associated with the proposed human activity.[6] For example, in the deliberations over proposed mariculture facilities, concerns over exclusive use, marine mammal entanglement, nutrient enrichment, the contamination of genetic strains of native species, and the inducement of changes in aggregation patterns of existing species have all been raised.[7] In some cases these concerns lead to vigorous debates.

Just as in the case of the siting of any commercial venture in the terrestrial environment, a project proponent seeks to avoid environmentally-sensitive areas, if for no other reason than to avoid controversy. One assumes that a prudent person, seeking an offshore site for his or her mariculture operation, would adopt a similar approach. However, in the context of the marine environment, these environmentally sensitive areas, such as Stellwagen Bank, are often highly productive and provide a powerful lure to marine species. Even the most savvy and well-meaning mariculturist may be inextricably drawn toward these environmentally sensitive areas.

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6. *See generally* NATIONAL RESEARCH COUNCIL, MARINE AQUACULTURE: OPPORTUNITIES FOR GROWTH 92-110 (1992).

7. *Id.*

B. Characterization and Identification of Essential Habitats

The sensitivity of some ocean areas appears to be directly proportional to the publicly perceived threat of a proposed activity. Proposals in the New England area EEZ seem to leap-frog the ocean searching for a site without a constituency that will resist the proposal. Due to the high costs involved with evaluating the sensitivity of open ocean marine areas, it makes greater economic sense to move a mariculture site at the first indication of trouble, rather than invest time and money in researching a potentially controversial area that may have to be abandoned in the future. Consequently, it is necessary that essential habitats be identified prior to the development of costly mariculture facilities.

A number of federal programs, either in place or being established, shed light on the problem of identifying critical habitats. The programs not only identify critical habitats, but also attempt to provide some enhanced protection for these areas in the EEZ. With regard to endangered marine mammals, the National Marine Fisheries Service (NMFS) has identified and designated critical habitat for the northern right whale.[8] This designation occurs under the provisions of the Endangered Species Act (ESA).[9] The designation has little regulatory consequence except in the administration of the Section 7 consultation, which is conducted for all major federal actions likely to affect a listed species.[10] The designation of a critical habitat "by itself, will not restrict private activities in a manner or to an extent that these activities are not already affected as a result of the listing of this species as endangered."[11] The designation does, however, force regulators to look more closely at the proposed activity.

Recently, the critical habitat designation appeared to play a prominent role in the review and ultimate redesign of a proposed sea scallop facility within the critical habitat area of the northern right whale. The characterization of the region as an essential habitat required that the project be adapted to accommodate concerns of potential northern right whale entanglement.[12] While it is unclear at this point how the critical habitat

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8. *See* Figure 1 p. 278, and Figure 2 p. 279.

9. 16 U.S.C. §§ 1531-1544 (1994).

10. 16 U.S.C. § 1536(a) (1994).

11. 59 Fed. Reg. 28,793, 28,804 (1994) (response to comment).

12. Letter from William W. Fox, Director, Office of Protected Resources, National Marine Fisheries Service, to William F. Lawless, Chief, Regulatory Division, U.S. Army Corps of Engineers (Jan. 18, 1996) (on file with the *Ocean and Coastal Law Journal*).

will affect future mariculture proposals, it seems that one of the lessons learned from the sea scallop proposal is that ESA critical habitat designations do not necessarily preclude mariculture, but may affect how or to what extent it is conducted.

Another area where essential habitats are receiving notable consideration is in the context of fishery management. In the reauthorization of the Magnuson Fishery Conservation and Management Act, Congress enacted new sections that will require Fishery Management Councils and NMFS to identify and protect essential fish habitats in Fishery Management Plans.[13] Under the amendments, NMFS and the Regional Fishery Management Councils are required to "identify essential fish habitat for the fishery . . ., minimize to the extent practicable adverse affects on such habitat caused by fishing and identify other actions to encourage the conservation and enhancement of such habitat."[14] Given that the National Oceanic and Atmospheric Administration (NOAA) has determined that mariculture is "fishing" under the definition of the Magnuson Act,[15] offshore mariculture will be affected by the identification of essential fish habitats. How this will manifest itself is yet to be fully determined, but the New England Fishery Management Council (the Council) is working toward the development of an aquaculture policy that will help guide future discussions and actions.[16]

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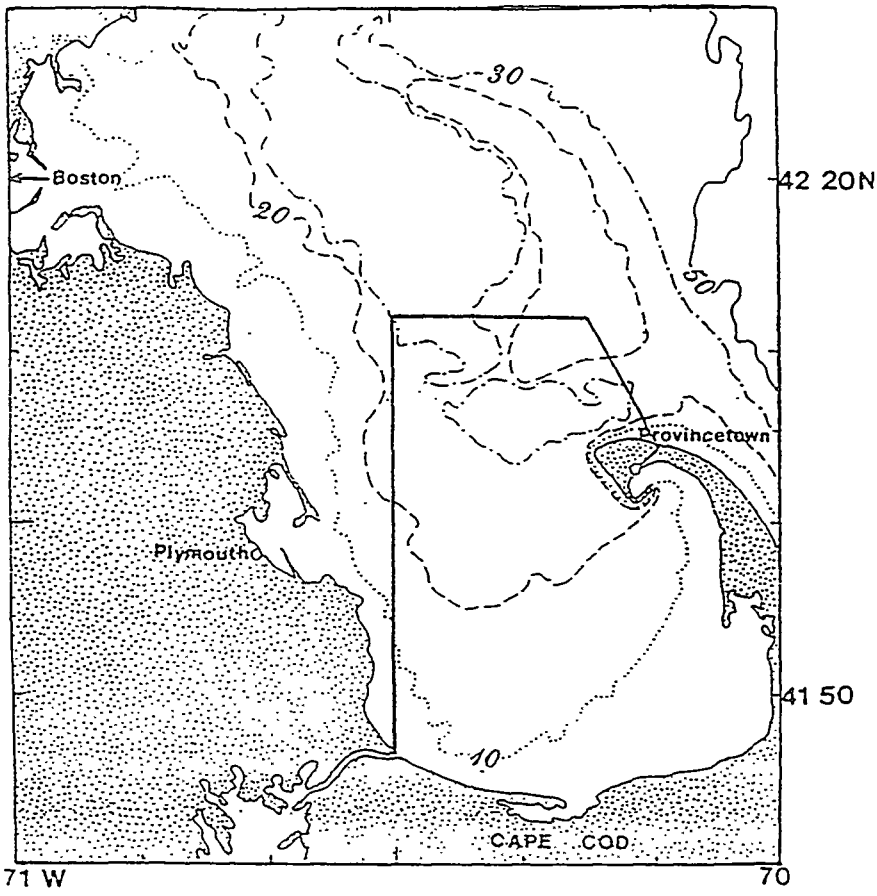
13. 16 U.S.C. §§ 1853(a)(7) (1994), *as amended by* § 108(a)(3), 110 Stat. at 3574.

14. *Id.*

15. Memorandum from Jay S. Johnson, N.O.A.A. Deputy General Counsel and Margaret F. Hayes, N.O.A.A. Assistant General Counsel for Fisheries, to James W. Brennan, N.O.A.A. Acting General Counsel for Fisheries (Feb. 7, 1993) *in* WILLIAM J. BRENNAN, BACKGROUND INFORMATION AND RECOMMENDATIONS FOR THE NEW ENGLAND FISHERY MANAGEMENT COUNCIL DEVELOPMENT OF AN AQUACULTURE DEVELOPMENT AND MANAGEMENT STRATEGY app. B, 2 (1995).

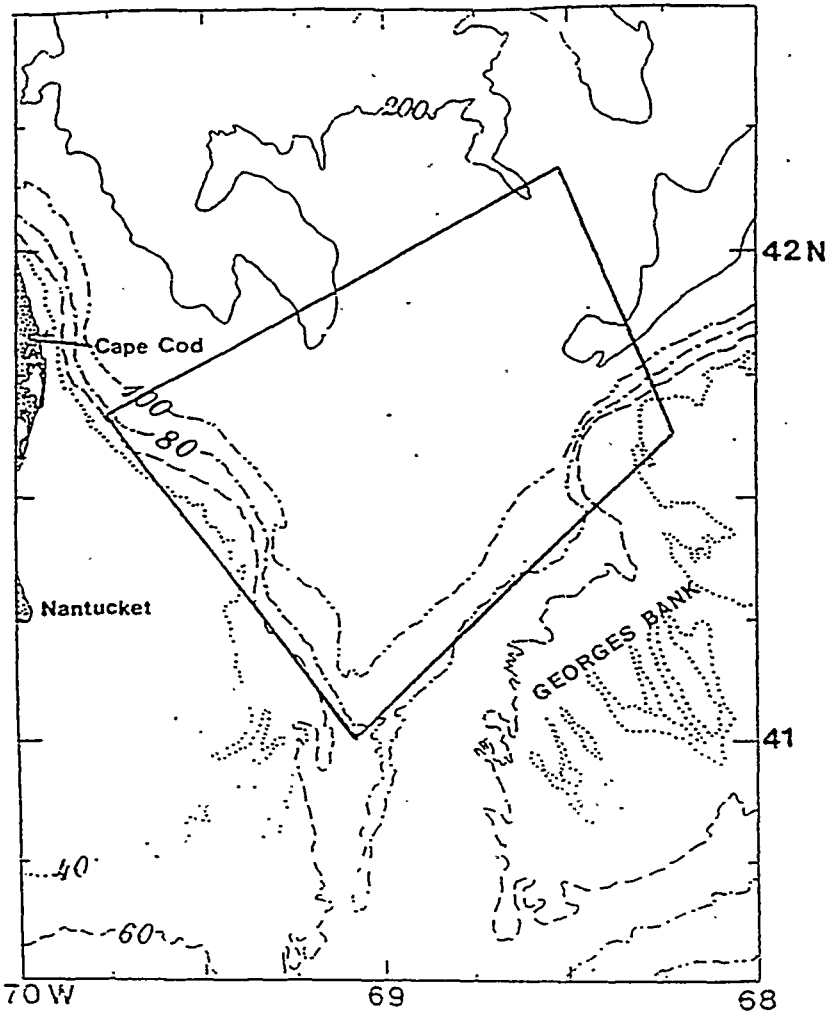
16. *See generally* WILLIAM J. BRENNAN, *supra* note 15. The Council, in recent deliberations over a proposed scallop aquaculture project in federal waters south of Martha's Vineyard, has demonstrated significant need for such a policy, which will hopefully be developed with considerable input from the mariculture community, a constituency not routinely involved in fishery management as conducted by the Councils and NMFS. *See* K.C. Myers, *Scallop Farm to Start Off the Vineyard*, CAPE COD TIMES, Mar. 2, 1996, at 36.

Figure 1. Cape Cod Bay Component of Northern Right Whale Critical Habitat*



* *See* 59 Fed. Reg. 28,793, 28,807 fig. 7 (1994).

Figure 2. Great South Channel Component of Northern Right Whale Critical Habitat*



* *See* 59 Fed. Reg. at 28,806 fig. 6.

Finally, in a more traditional context regarding essential habitat identification, the National Marine Sanctuary Program[17] works to identify and designate areas of the marine environment that are considered by Congress and NOAA to be of "special national significance."[18] Since the program began, twelve sites have been established[19] in state, federal, tribal, and territorial waters from American Samoa to New England. Each of these marine sanctuaries provides a unique regulatory regime that protects the special characteristics of each site.[20] Until recently, mariculture was rarely given much direct attention in the development of sanctuary regulations. While most management plans developed for the sites addressed aquaculture or mariculture as an existing activity, it is only in the last few designations where the matter is explicitly addressed in the promulgated regulations.[21] In addition, the program has experienced little contact with any serious offshore mariculture proposals and therefore has not been presented with the opportunity to address the issue directly. Accordingly, the regulatory impact of sanctuary designation on mariculture is mostly implicit,[22] given the broad application of general sanctuary regulations that may apply to various aspects of the construction and operation of a mariculture facility.[23]

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17. *See supra* note 2.

18. 16 U.S.C. § 1431(b)(1) (1994).

19. *See generally* 50 C.F.R. pt. 922 (1996).

20. *See, e.g.*, 50 C.F.R. §§ 922.71, 922.91 (1996) (providing unique regulations concerning oil pollution and exploration for the Channel Islands National Marine Sanctuary and special regulations concerning interference with tropical marine species for the Gray's Reef National Marine Sanctuary).

21. 15 C.F.R. § 922.82(a)(3)(iii) (1996) (allowing anchorage for mariculture in the Point Reyes/Farallon Islands National Marine Sanctuary); 15 C.F.R. § 922.132(a)(3) (1996) (allowing aquaculture operations to interfere with sanctuary resources in Monterey Bay National Marine Sanctuary).

22. *See* Table 1, pp. 281-82.

23. With the possible exception of the *MONITOR* Sanctuary, which prohibits just about everything in the one nautical mile circle surrounding the wreck of the USS *MONITOR*, it is likely that some form of mariculture would be acceptable within some part of any of the other eleven sanctuaries. In fact, in the proposed management plan for the Florida Keys NMS, the Research and Monitoring Action Plan states that the Sanctuary should (in cooperation with the State of Florida and Sea Grant) "assess, develop, and promote aquaculture alternatives for all commercially harvested marine species" in the Sanctuary. It is also notable, however, that there are a number of zones in the Sanctuary (the proposed Florida Keys NMS has an extensive and somewhat controversial marine zoning program) such as Sanctuary Preservation Areas, where it is almost certain that mariculture of any type will be prohibited.

Table 1: List of Regulations Affecting Aquaculture Activities in National Marine Sanctuaries*

Site/State Designation Date	Size (sq. nmi.)	Jurisdictions Involved	Current Aquaculture Activity	Relevant Regulations
MONITOR - NC (1975)	1 circular nmi.	Federal	none	Implicitly Prohibited (no anchoring)
Gray's Reef - GA (1981)	17	Federal	none	Implicitly Regulated (alteration of seabed/ discharge prohibition)
Point Reyes Gulf of Farallones - CA (1981)	948	Federal/State	oysters abalone	Possibly Regulated (mariculture explicitly exempted from alteration of seabed provision, but discharges may be subject to regulation)
Fagatele Bay - Am. Samoa (1986)	0.28	Territorial	none	Implicitly Regulated (alteration of seabed prohibition)
Cordell Bank - CA (1989)	397	Federal	none	Possibly Regulated (discharge prohibition)
Flower Garden Banks - TX (1992)	41.7	Federal	none	Implicitly Regulated (alteration of seabed/ discharge prohibition)
Monterey Bay - CA (1992)	4024	Federal/State	salmon, clams, oysters, algae, abalone, kelp, sea hares, lobster	Explicitly exempt from altering seabed provision but may be implicitly regulated under discharge prohibition
Stellwagen Bank - MA (1993)	638	Federal	sea scallop (research only)	Mariculture listed as "subject to regulation" but currently only implicitly regulated (alteration of seabed/discharge prohibitions)

Site/State Designation Date	Size (sq. nmi.)	Jurisdictions Involved	Current Aquaculture Activity	Relevant Regulations
Hawaiian Is. Humpback Whale - HI (1992) [MP in development]	c. 2000	Federal/State	fish (native Hawaiian fish ponds)	No direct regulation proposed ... all through State
Olympic Coast - WA (1995)	2500	Federal/ State/Tribal	salmon (tribal hatcheries)	Implicitly Regulated (alteration of seabed discharge prohibitions)
Florida Keys - FL (inc. existing Looe Key and Key Largo NMS) [MP in Development]	2800	Federal/State	live rock, conch, shrimp, finfish	Proposed regulations would review, but not permit, leases in State waters, and participate in joint permitting for live rock aquaculture in Federal waters with ACOE and NMFS. Mariculture is explicitly listed in the proposed designation document as an activity "subject to regulation"

* *See generally* 15 C.F.R. pt. 922 (1996). Table compiled by author.

III. THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY EXPERIENCE

A. Characteristics of the Stellwagen Bank

In 1992, after NOAA conducted an extensive public review of the proposed designation of Stellwagen Bank, Congress designated the area as a National Marine Sanctuary (the Sanctuary).[24] The Sanctuary encom-

24. National Marine Sanctuaries Reauthorization and Improvement Act of 1992, Pub. L. No. 102-587, 106 Stat. 5048. *See also* NATHALIE WARD, CENTER FOR COASTAL STUDIES, STELLWAGEN BANK: A GUIDE TO THE WHALES, SEABIRDS, AND MARINE LIFE OF THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY 7-9 (1995).

passes 638 square nautical miles of ocean area off the coast of Boston, Massachusetts[25] between Cape Ann and Cape Cod.[26] Located entirely within federal waters,[27] the Sanctuary includes the underwater geological feature known as Stellwagen Bank, the deeper and more bathymetrically complex Tillies Bank and Basin, and the southern, shallowest portions of Jeffreys Ledge.[28]

As a result of the upwelling of nutrient rich, deep offshore water, the sanctuary is a highly productive and biologically rich area supporting a valuable inshore groundfish fishery and one of the most important bluefin tuna fisheries in the Western North Atlantic.[29] It is also widely recognized as an important feeding area for whales, including the highly endangered northern right whale and other marine mammals.[30] There is a whale-watch industry targeting Stellwagen Bank that has served millions of whale watchers over the last decade, giving it the reputation as New England's premier whalewatching grounds."[31] Additionally, a well-traveled shipping lane crosses the Bank,[32] and there is a major regional dredged material disposal site located less than 200 meters from the Sanctuary boundary.[33] While it is only a medium-sized sanctuary in comparison to others in the National Marine Sanctuary Program, it certainly ranks among the most popular.

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25. 15 C.F.R. § 922.140(a) (1996).

26. *See* Figure 3, p. 284.

27. 15 C.F.R. § 922.140(b) (1996).

28. 15 C.F.R. § 922-140(a) (1996).

29. *See* WARD, *supra* note 24, at 83-84. "Commercially important fish in the Stellwagen Bank region include groundfish such as cod and flounder, mid-water fish such as mackerel, and open-ocean fish such as bluefin tuna. Together they generate about $15 million annually." *Id.*

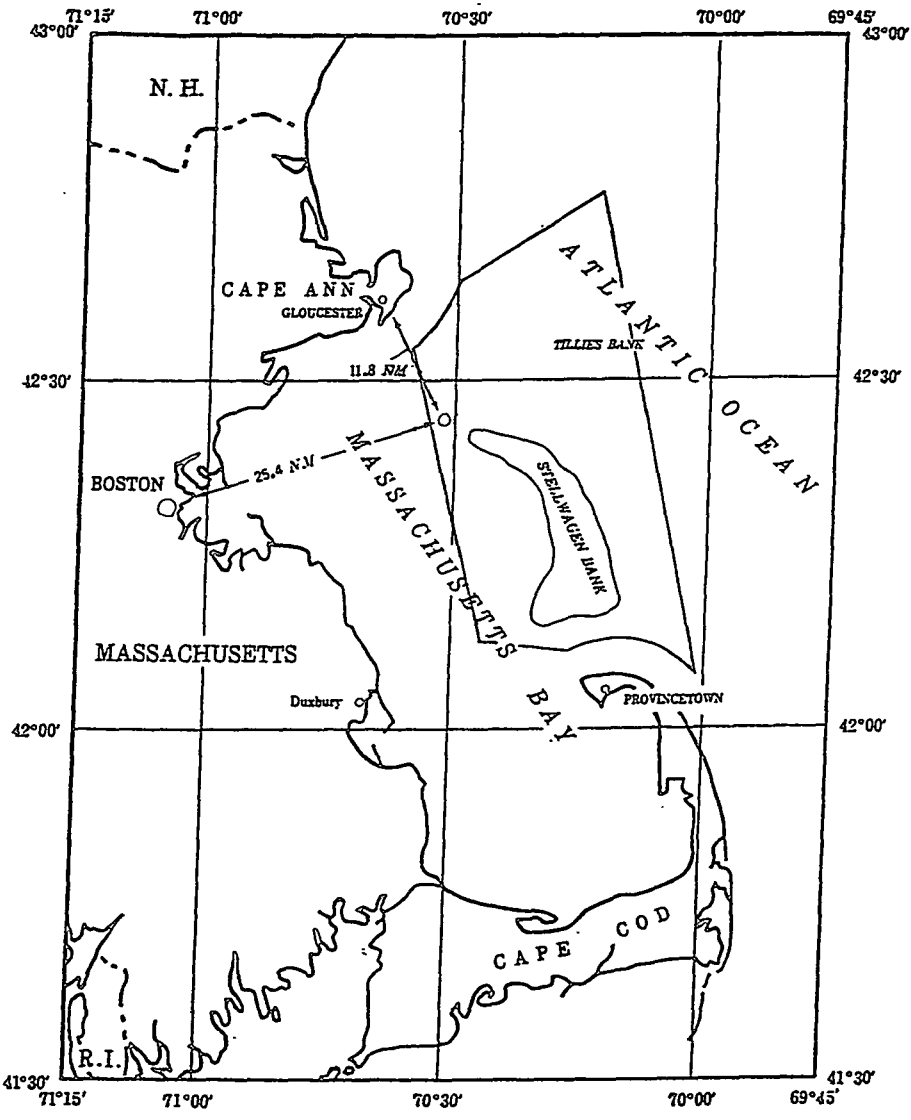
30. *Id.* at 143.

31. *See* Indira A. R. Lakshmanan, *Officials Dedicate Marine Preserve,* BOSTON GLOBE, June 27, 1993, at 26; *Whalewatching from a Tall Ship*, PR Newswire, May 18, 1994, *available in* LEXIS, News Library, PRNEWS File.

32. WARD, *supra* note 24, at 141 (noting that there are numerous ports surrounding Stellwagen Bank, and that an international shipping lane to Boston runs across the sanctuary).

33. *See id.* at 13 (map depicting location of dredged material disposal site).

Figure 3. Stellwagen Bank National Marine Sanctuary*



* U.S. Dep't of Comm., NOAA, Sanctuaries and Reserves Div., Stellwagen Bank National Marine Sanctuary, Final Environmental Impact Statement/Management Plan: Volume I 13 Fig. 3 (1993).

B. Proposed Designation of the Stellwagen Bank National Marine Sanctuary

During the review of the proposed sanctuary designation, mariculture was one of the debated issues. Of the numerous written comments received by NOAA regarding the proposed designation, a considerable number spoke to the issue of mariculture, and the overwhelming majority recommended that the regulations prohibit all mariculture activity in the Sanctuary.[34] The objections raised against mariculture activity were: potential conflict with vessel traffic; possible adverse impacts to marine mammals and seabirds resulting from entanglements in nets; potential negative effects on water quality; and concern about the "privatization" of public waters.[35] While there was considerable public pressure to prohibit mariculture in the Sanctuary, NMFS argued that not enough was known about the activity to ban it outright, and that mariculture warranted additional study and discussion to determine how to properly address mariculture use.[36] With the support of NMFS, NOAA made the decision to expressly omit mariculture from the list of prohibited activities.[37] Mariculture, however, was included in the list of activities that are subject to Sanctuary regulation.[38]

C. Regulatory Structure within the Sanctuary

The Stellwagen Bank is a highly regulated area. Regulations include prohibitions on altering the seabed, and discharges or deposits of materials into the Sanctuary.[39] These prohibitions trigger the Sanctuary permit process and review is conducted to addresses such proposed activities.[40] With regard to mariculture, the process is somewhat different. Under the

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34. *See* 58 Fed. Reg. 53,865, 53,686-869 (1993).

35. *Id.* at 53,868.

36. Letter from Thomas E. Bigford, Division Chief, Habitat and Protected Resources Division, National Marine Fisheries Service, Northeast Region, to Joseph Uravitch, Sanctuaries and Reserves Division, National Ocean Service, NOAA (Apr. 8, 1991), *in* U.S. DEP'T OF COMM., NOAA, SANCTUARIES AND RESERVES DIV., STELWAGEN BANK NATIONAL MARINE SANCTUARY, FINAL ENVIRONMENTAL IMPACT STATEMENT/ MANAGEMENT PLAN: VOLUME II: APPENDICES G-18, G-20 (1993).

37. *See* 15 C.F.R. § 922.142 (1996).

38. *See* 58 Fed. Reg. at 53,973.

39. 15 C.F.R. § 922.142(a)(3) (1996).

40. 15 C.F.R. § 912.143 (1996).

current, more indirect regulatory environment surrounding mariculture activity in the Sanctuary, the Sanctuary Director becomes a participant in a more routine permitting process.[41] Through this process, an activity may be sanctioned by a permit of another agency, provided that the permit is reviewed by the Sanctuary with any conditions attached by the Sanctuary incorporated therein.[42]

To address the uncertainties of this permitting process, the Sanctuary embarked on a program to collect available information on the types of mariculture operations likely to be proposed for the Sanctuary, and to allow for appropriate research within the Sanctuary that will help to address some of the outstanding questions. For instance, in bottom cage culture research currently being conducted in the Stellwagen Bank Sanctuary, the project operator has been directed to provide periodic reports on matters such as lost cages, gear conflicts, and entanglements. This provides practical information regarding perceived concerns of conflicts with existing uses and entanglement. The Sanctuary is also seeking to involve members of the regional mariculture community to assist with collecting information and discussing such issues with Sanctuary staff, state and federal representatives, other Sanctuary users, and the public. The focus of these discussions will be on whether mariculture should be conducted within the Sanctuary, and, if so, under what circumstances and conditions.[43]

IV. CONCLUSION

There should be general agreement that some areas of the ocean are of such sensitivity, or other importance, that mariculture should be prohibited. Taking into consideration the existing deficient mechanisms for identifying essential habitats in the marine environment, and accepting the fact that offshore mariculture is so new that many of the potential environmental concerns have not been adequately addressed, the point has not been reached where these existing programs can help to sufficiently

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41. *See* 15 C.F.R. § 922.49 (1996) (establishing procedure for notification and review of applications for leases, licenses, permits, approvals or authorizations to conduct prohibited activities).

42. 15 C.F.R. § 922.49(c) (1996).

43. One of the strategies to be discussed over the coming months is whether "mariculture research zones" might be identified to encourage research in the areas of the Sanctuary least likely to be affected by mariculture.

reduce the areas of uncertainty. In general, the nascent mariculturist would be wise to avoid, if possible, essential habitat areas.[44] Furthermore, once a facility is operational, it is critical that a carefully crafted monitoring program be established to help managers and regulators better separate the "real" impacts from the potential ones. Once this information is obtained, the issue of where mariculture should be prohibited can be resolved more efficiently.

The issue of exclusive use of ocean areas is a legal and policy question of formidable complexity and controversy. Oceans are a public resource, not the exclusive province for mariculture activities.[45] The public must be brought into the discussions regarding proposed mariculture regulations, and compelling arguments must be offered to garner their support now. Mariculture lease programs will almost certainly have to be developed in order to provide the public fair reimbursement for the use of these common resources. Issues concerning the privatization of public resources are expressly visible in the mariculture debate, where entire areas of the ocean must be set aside for exclusive use by private enterprise. Accordingly, these are the primary issues that must be addressed in the context of the mariculture debate.

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44. *See supra* Part II.B.

45. For a complete discussion of the nature and extent of public and private rights in common property marine resources, *see generally* BRUCE H. WILDSMITH, AQUACULTURE: THE LEGAL FRAMEWORK 93-118 (1982).