

Community-Based Management of Atlantic Cod by the Georges Bank Hook Sector: Is It a Model Fishery?

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I. INTRODUCTION

“Fecund, impervious to disease and cold, feeding on most any food source, traveling to shallow waters and close to shore, it was the perfect commercial fish. . . .”¹ The Atlantic cod is a remarkable fish. It has survived more than one thousand years of commercial fishing and

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This Article was initially written for Professor Katrina Wyman’s Natural Resources Law class at NYU. I am profoundly grateful to Professor Wyman for her insightful comments and guidance. I would also like to extend my sincere thanks to Paul Parker, Executive Director of the Cape Cod Commercial Hook Fishermen’s Association, for his insights. I hope this Article represents a small wave in the ocean of effort that will be required if we are to restore our ocean’s bounty for future generations.

1. MARK KURLANSKY, *COD: A BIOGRAPHY OF THE FISH THAT CHANGED THE WORLD* 32 (1997).

international trade.² And until approximately ten years ago, it remained abundant in the waters off the coast of New England. Since the collapse of Atlantic cod stocks in the mid-1990s, policymakers have responded in a variety of ways.³

This Article explores one of the more recent innovations in U.S. federal fisheries policy—the Sector approach. My analysis focuses on the case of the Georges Bank Cod Hook Sector, the first Sector approved by the federal government.⁴ A Sector, as the term is used in fisheries management, is a group of fishermen who voluntarily agree to accept greater responsibility for managing a fishery in exchange for greater regulatory flexibility and an allocation of fishing rights.

The main question I seek to answer is whether the Georges Bank Cod Hook Sector should be considered a model fishery by persons interested in achieving better conservation and use outcomes in fisheries, as well as by those who believe in preserving local fishing communities and cultures.

For context, I provide a brief historical overview of the Atlantic cod fishery in Part II. Resource abundance, open access, and wealth generation are the themes of this history. In Part III, I provide multiple reinforcing explanations for the demise of the Atlantic cod. Part IV gives the reader a general overview of the United States fisheries management regime at the state, national, regional, and international levels. My focus here is at the federal and regional levels of fisheries management because these levels have the most direct impact on the Atlantic cod fishery. Community-based approaches to fisheries management are examined in Part V by asking why community-based approaches to natural resource management arise. Part VI outlines the organizational structure of the Georges Bank Hook Sector. In Part VII, I delve into the key question this Article hopes to shed light on: Is the Georges Bank Hook Sector a model fishery? In answering this question, I will assess the Sector's outcomes in terms of use, conservation, preservation of local fishing communities, and organizational viability. In Part VIII, I provide concluding thoughts including my finding that in many ways, the Georges Bank Hook Sector is a model fishery, though it may only be a replicable model for fishing communities sharing several of the same

2. See *id.* at 22 (“By the year 1000, the Basques had greatly expanded the cod markets to a truly international trade that reached far from the cod’s northern habitat.”).

3. JAMES RASBAND ET AL., NATURAL RESOURCES LAW AND POLICY 468 (2004). Legislation that reauthorized and amended the Magnuson Act in 1996 was Congress’s response to the collapse of major fisheries in New England (e.g., Atlantic cod) and the Gulf of Mexico.

4. Roger Fleming et al., *Twenty-Eight Years and Counting: Can the Magnuson-Stevens Act Deliver on Its Conservation Promise?*, 28 VT. L. REV. 579, 602 (2004).

characteristics as the fishing communities which formed the Georges Bank Hook Sector.

II. HISTORICAL OVERVIEW OF THE ATLANTIC COD FISHERY

On top of the dome of the Massachusetts Capitol building is a symbol of the state's wealth, of its cultural heritage, and of its historical dependence upon nature's bounty—the cod. For thousands of Portuguese immigrants in America, the cod was effectively their ticket to the new world.⁵ Along with immigrants from other nations, they came to fish New England's cod. To this very day, the Commonwealth of Massachusetts is home to many of these immigrants' descendants. Traditionally, all those who fished off the coasts of the United States did so with few legally established limits. As Libecap explains, fisheries have been characterized by “chronic common pool conditions.”⁶ Such conditions arise from the open-access situation that Hardin termed the “Tragedy of the Commons,” wherein all the individuals and groups of people take as much as possible from a free resource without considering the common need for conservation.⁷

From the founding of the United States until 1976, many nations generated vast amounts of wealth by freely fishing as much cod as they wished off the New England coast. Although to refer to “cod” is to oversimplify. There are in fact ten families and over 200 species of cod in the world, almost all of which are found in the cold waters of the northern latitudes.⁸ Although there are many types of cod, the Atlantic cod is generally considered to be the most desirable since it is “the largest, with the whitest meat.”⁹ Two stocks of Atlantic cod exist: Gulf of Maine cod and Georges Bank cod.¹⁰

Since 1976, the bounty and collapse of the Atlantic cod has been owned by the United States. It was in that year that Congress passed the Magnuson Fisheries Conservation and Management Act prohibiting foreign vessels from fishing within 200 miles of the U.S. coast. Enforcement by the federal government of this exclusive fisheries zone resulted in the percentage of fish taken by foreign vessels in U.S. waters

5. Cod Fishing in New England Coastal Waters, <http://www.loc.gov/rr/Hispanic/portam/cod.html> (last visited Mar. 23, 2007).

6. GARY D. LIBECAP, *CONTRACTING FOR PROPERTY RIGHTS* 15 (1989).

7. Garrett Hardin, *The Tragedy of the Commons*, 162 *SCIENCE* 1243, 1244 (1968).

8. KURLANSKY, *supra* note 1, at 38-39.

9. *Id.* at 39.

10. Ralph Mayo & Loretta O'Brien, Atlantic Cod, <http://www.nefsc.noaa.gov/sos/spsgn/pg/cod> (last revised Jan. 2000).

declining from seventy-one percent in 1977 to almost zero in 1992.¹¹ Whereas foreign landings (“landings” equal the total amount of fish caught minus the amount of “bycatch”—undesired fish and other marine life that is thrown back into the ocean) in waters within 200 miles of the U.S. coasts declined precipitously and eventually ended, the landings of U.S. fishermen doubled from 1977 to 1997.¹²

Data from the National Marine Fisheries Service provides a quantitative sense of the Atlantic cod fishery during the last half-century.¹³ Prior to the United States’ establishment of its exclusive fisheries zone, the annual average total of Atlantic cod landings in the United States (presumably by U.S. vessels) was relatively stable with fifty-seven million pounds in 1950, forty million pounds in 1960, fifty-three million pounds in 1970, and fifty-six million pounds in 1975. After passage of the 1976 Magnuson Act, the fishery experienced a major increase in landings followed by a sudden collapse in stocks resulting in a drastic decrease in landings. In 1977, seventy-seven million pounds were landed. By 1980, the number had risen to one hundred and eighteen million pounds. Ninety-six million pounds were taken in 1990. Soon thereafter, the bottom fell out. In 1995, only thirty million pounds were landed and by 2003 the figure had dropped to twenty-four million pounds. These statistics reveal that Atlantic cod landings in the United States were less than half in 2003 what they were in 1950, and were only about one fifth the level of landings in the peak year of 1980.

Furthermore, it should be noted that the aforementioned statistics do not count pre-1977 landings of Atlantic cod, in countries other than the United States, taken from waters now comprising the United States Exclusive Economic Zone (USEEZ). Therefore, the total pre-1977 take of Atlantic cod from present day USEEZ waters may have been substantially higher than the above figures indicate.

Finally, one should note that landings are not necessarily indicative of the population or biomass level of a fish stock. For example, landings can decline due to factors other than a reduction in the fish stock such as reduced effort on the part of fishermen to catch a particular kind of fish.

11. RASBAND, *supra* note 3, at 468.

12. *Id.*

13. NMFS Landings Query Results for (years: 1950 to 2003; species: “cod, Atlantic”; state: all states), http://www.st.nmfs.gov/st1/commercial/landings/annual_landings.html (last visited Feb. 4, 2007).

III. WHY DID THE ABUNDANCE END?

The plunge in Atlantic cod stocks exemplifies the decline in fisheries around the world in the latter half of the twentieth century. Sylvia Earle, the esteemed oceanographer and former Chief Scientist at the National Oceanographic and Atmospheric Administration (NOAA), has sought to explain the depleted state of the world's fisheries by pointing to the vast expansion in human demand for fish coupled with greatly improved technology for locating, taking, and transporting fish.¹⁴ She points out that the global fisheries take expanded fivefold from 1950 to 1990.¹⁵ It has also been estimated that the same amount of cod was caught from 1960 to 1975 as was caught from 1500 to 1750.¹⁶ In Earle's words, "various factors are responsible for the collapse of wild ocean populations, from pollution and habitat destruction to high-tech capture techniques and government subsidies that perpetuate otherwise unprofitable ventures. But there is no doubt about the main cause of the problem: *too many fishermen, not enough fish.*"¹⁷

In addition to overcapitalization, habitat destruction is one of the primary causes of the decline in fisheries productivity. With compromised ecosystems, fish are unable to thrive. Drift nets, gill nets, scallop dredges, and bottom trawls have been cited as among the most destructive types of fishing gear.¹⁸ Bottom trawlers in particular have been singled out for their detrimental effects to the ocean floor habitats of groundfish, such as cod. With reference to the use of bottom trawlers in the Atlantic cod fishery off of Newfoundland, Kurlansky has observed that "[t]o a cod, ocean floors mean safety. That is why they were rendered commercially extinct by bottom draggers."¹⁹

Given the significant negative conservation impacts, one must ask why the use of bottom trawlers continues to this day, including by U.S. vessels in search of Atlantic cod. The answer is twofold: economic efficiency and the externalization of ecological costs. According to the New England Fishery Management Council, four types of gear are used to catch groundfish in New England waters: (1) otter trawl (i.e., bottom trawl or dragger), (2) sink gillnet, (3) hook and line, and (4) bottom

14. SYLVIA A. EARLE, *SEA CHANGE: A MESSAGE OF THE OCEANS* 169 (1995).

15. *Id.* at 185.

16. RASBAND, *supra* note 3, at 427.

17. EARLE, *supra* note 14, at 170.

18. *Id.* at 172; E-mail from Paul Parker, Executive Dir. of the Cape Cod Commercial Hook Fishermen's Ass'n to André R. Verani (Dec. 20, 2005, 10:17:20 EST) (on file with author) (mentioning scallop dredges as among the most harmful types of fishing gear).

19. KURLANSKY, *supra* note 1, at 10.

longline. Of the 1888 active groundfish vessels, almost one half used primarily otter trawls and about one quarter used primarily hook and line. In terms of groundfish landings, the trawlers far outperformed the hook-and-line vessels. Rather than landing twice as many groundfish as the hook-and-line fishermen (which would be the expected ratio if the two types of gear were equally efficient, all other things being equal), the trawlers landed 81% of the catch whereas the hook and line fishermen landed a mere 1.6%.²⁰ Furthermore, the use of trawlers continues because ecological costs of habitat destruction and bycatch are largely not considered. It would be remiss not to mention that human activities other than fishing also have a substantial negative impact on marine habitats.²¹

Bycatch is another severe problem. Modern commercial fishing gear often catches far more than the targeted fish, and much of this undesirable bycatch is thrown back into the sea either dead or harmed.²² These undesirable fish include target species that are under the regulatory minimum for landing, species subject to seasonal limits for which the market price is lower than it might otherwise be in the future, and nontarget species that lack commercial value. A recent study concluded that one fifth of the total U.S. catch is bycatch.²³ Moreover, many plants and animals such as starfish, crabs, sponges, and coral are not even considered in federal bycatch calculations²⁴ despite their value to ocean ecosystems.

The collapse of the Atlantic cod stocks experienced in the mid-1990s²⁵ appears to have resulted from a combination of the aforementioned factors of overcapitalization, increased global demand, technological advances, and habitat destruction. Before moving on to an overview of the U.S. fisheries management regime, it should be noted that the decline in Atlantic cod landings has not always translated into

20. New Eng. Fisheries Mgmt., *supra* note 10.

21. E-mail from Paul Parker, *supra* note 18 (alluding to habitat impacts not attributable to fishing such as climate change, nitrogen loading, and discharge of land-based pollution into the seas).

22. See 16 U.S.C. § 1802 (2000) (defining “bycatch” as “fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards”).

23. All Things Considered (Nat’l Pub. Radio broadcast Dec. 1, 2005), *available at* <http://www.npr.org/templates/story.php?storyId=503506> (referring to 2005 research findings of Rosenberg et al. concerning bycatch rates).

24. EARLE, *supra* note 14, at 173; 16 U.S.C. § 1802(2).

25. KURLANSKY, *supra* note 1, at 221 (“In 1994, when the National Marine Fisheries Service counted fish stocks. . . . The assessment showed that the cod stock on Georges Bank was about 40 percent of what had been found in 1990. That sharp a decline had never before been measured on Georges Bank.”).

less revenue from Atlantic cod fishing.²⁶ In other words, market price increases and correlated revenue gains might compensate for revenue losses due to lower volume caught.

IV. FISHERIES MANAGEMENT IN THE UNITED STATES

U.S. fisheries regulation presents an interesting division of labor among the state, regional (e.g., New England), and federal levels. U.S. states are responsible for managing fisheries from the shoreline to three miles out to sea (i.e., in-shore).²⁷ At the national level, two pieces of legislation are of paramount importance: the 1976 Magnuson Fisheries Conservation and Management Act (hereinafter Magnuson Act) and the 1996 legislation which reauthorized and amended the Magnuson Act renaming it the Magnuson-Stevens Act (MSA).²⁸

The original Magnuson Act established exclusive federal authority over fisheries from three to two hundred miles out from shore,²⁹ thus proprietizing oceanic fisheries to a significant degree by transforming them from global commons to national commons. Congress delegated implementation authority with regards to the Act's provisions to the Department of Commerce within which the NOAA division known as NOAA Fisheries (also known as the National Marine Fisheries Service—NMFS) shares federal responsibility for fisheries with the Regional Fisheries Management Councils established in the Magnuson Act.³⁰

The Regional Fisheries Management Councils (Regional Councils) formulate Fisheries Management Plans (FMP), which are reviewed for compliance with the Magnuson-Stevens Act by NMFS.³¹ Once a FMP is approved, NMFS issues implementing regulations.³²

Regional Councils' membership is regulated by federal statute.³³ For example, the New England Regional Council must have eighteen voting members, twelve of whom must be appointed by the Secretary of Commerce after receiving nominations from the Governors of the constituent states.³⁴ The six voting members not appointed by the

26. Peter Shelley et al., *The New England Fisheries Crisis: What Have We Learned?*, 9 TUL. ENVTL. L.J. 221, 225 (1996) (noting the rise in total revenue from cod landings between 1983 and 1993 despite a less than fifty percent decline in landings).

27. See Cape Cod Commercial Hook Fishermen's Ass'n, Federal Fisheries <http://www.cchfa.org/pages/1/36/35/> (last visited Jan. 28, 2007).

28. RASBAND, *supra* note 3, at 467-68.

29. *Id.* at 467.

30. *Id.*

31. *Id.* at 467, 470-71.

32. *Id.* at 471.

33. 16 U.S.C. § 1851(a)(3) (2000).

34. *Id.* § 1852(a)(1)(A).

Secretary are the principal fisheries managers of the five constituent states of Connecticut, Rhode Island, Massachusetts, New Hampshire, and Maine as well as the regional NMFS director. The MSA instructs the Secretary to appoint the other eleven voting members by selecting persons “who, by reason of their occupational or other experience, scientific expertise, or training, are knowledgeable regarding the conservation and management, or the commercial or recreational harvest, of the fishery resources of the geographical area concerned.”³⁵ Additionally, the Secretary “shall, to the extent practicable, ensure a fair and balanced apportionment . . . of the active participants . . . in the commercial and recreational fisheries under the jurisdiction of the Council.”³⁶

Generally speaking, scientists and environmentalists are not represented on the Regional Councils as voting, or for that matter nonvoting, members.³⁷ Rather, the Regional Councils have thus far been composed almost entirely of government officials and representatives of commercial and recreational fishermen, leading some to comment that the Regional Councils are an example of public choice theory in action.³⁸ Another commentator has described the New England Regional Council as “dominated by fishing interests.”³⁹

The 1976 Magnuson Act was motivated primarily by domestic fishing interests, with conservation concerns relegated to inferior status.⁴⁰ The success of the Magnuson Act in developing the U.S. fishing industry (largely through subsidies) and driving out foreign boats is now acknowledged.⁴¹ Earle summed up the effect of the Magnuson Act as replacing “overfishing in U.S. waters by foreign fishermen with overfishing by domestic fishermen.”⁴²

The 1996 amendments, however, attempted to strike a better balance between the dual imperatives of use and conservation. For example, the MSA requires that FMPs aim to rebuild stocks within ten

35. *Id.* § 1852(b)(2)(A).

36. RASBAND, *supra* note 3, at 468-69; E-mail from Paul Parker, *supra* note 18 (noting that one seat was added through a legislative rider two years ago). For a list of current NEFMC members, see New Eng. Fishery Mgmt. Council, Council Members and Staff, <http://www.nefmc.org/staff/> (follow “Council Members” hyperlink) (last visited Mar. 3, 2007).

37. RASBAND, *supra* note 3, at 468-69.

38. *Id.* at 472.

39. KURLANSKY, *supra* note 1, at 221.

40. RASBAND, *supra* note 3, at 467.

41. *Id.* at 468.

42. EARLE, *supra* note 14, at 195.

years (with certain exceptions).⁴³ In addition to requiring that stocks be rebuilt within a determined period of time, the MSA introduces five major changes intended to improve conservation outcomes. It requires that NMFS (1) develop objective and measurable definitions of overfishing for all fish populations under management, (2) end overfishing, (3) monitor and minimize bycatch, and (4) protect essential fish habitats.⁴⁴ Additionally, the MSA redefines “optimal yield” such that it has to be equal to or lower than the maximum sustainable yield, whereas under the Magnuson Act optimal yield could be, and often was, set by the Regional Councils at a level exceeding maximum sustainable yield.⁴⁵

The ten national standards, seven of which were introduced as part of the original Magnuson Act, are another vital aspect of the MSA. Of the ten national standards, number four is particularly relevant to my assessment of the viability of the Georges Bank Hook Sector as a model fishery since it addresses the allocation of fishing rights. National Standard 4 states:

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.⁴⁶

Georges Bank fisheries have also been impacted by international law. In 1984, the International Court of Justice delimited the maritime boundary between the United States and Canada, which included dividing Georges Bank.⁴⁷ Given that certain Atlantic cod stocks migrate between the American and Canadian portions of Georges Bank, there is a

43. Michael C. Laurence, Note, *A Call to Action: Saving America's Commercial Fishermen*, 26 WM. & MARY ENVTL. L. & POL'Y REV. 825, 831 (2002).

44. Fleming et al., *supra* note 4, at 580.

45. *Id.* at 585-87.

46. 16 U.S.C. § 1851(a)(4) (2000). The United States District Court for the District of Rhode Island held in *Ace Lobster v. Evans*, 165 F. Supp. 2d 148, 178-81 (2001), that National Standard 4 allows disparate impacts on residents of different states if the hardship imposed is outweighed by the total benefits to others, and if the hardship imposed is rationally connected to the achievement of optimum yield or a fisheries management plan. This decision may serve to facilitate the allocation of fishing rights as well as to defend against claims that National Standard 4 has been violated.

47. *Delimitation of the Maritime Boundary in the Gulf of Maine Area (U.S. v. Can.)*, 1984 I.C.J. 246 (Oct. 12).

need for some degree of joint management.⁴⁸ However, it is not the purpose of this Article to explore the complexities of transnational management of cod.

V. COMMUNITY-BASED APPROACHES TO FISHERIES MANAGEMENT

Various theories attempt to explain how community-based approaches to natural resource management arise. Generally speaking, community-based approaches to natural resource management are carried out by local communities using local knowledge often derived from their exploitation and/or conservation of the resource in question. Community-based approaches are not necessarily exclusive of government involvement in managing the resource. In the case of the Georges Bank Hook Sector, community-based management exists within the framework of state and federal regulation.

Libecap has written about the “political bargaining or contracting underlying the establishment or change of property institutions.”⁴⁹ In his view, “whether or not the more complete defining of property rights is socially beneficial depends on the magnitude of common pool losses, the nature of contracting costs to resolve them, and the costs of defining and enforcing property rights.”⁵⁰ Libecap cites three barriers to contracting for property rights in the realm of fisheries: (1) disputes over allocation of fishing rights, (2) concerns over distributional impacts, and (3) legal restrictions on assigning private property rights to fish.⁵¹ Libecap’s work provides a general theoretical framework for thinking about community-based approaches to managing natural resources.

Ostrom, on the other hand, addresses specific characteristics of groups that have successfully implemented community-based management. These communities share the following characteristics that facilitate the generation and enforcement of rules: (1) small size, (2) stability, (3) strong sense of community, (4) high dependence on the resource in question, and (5) a conservation ethic to preserve the resource for future generations.

A comparative review of community-based natural resource management policies around the world found that these approaches shared certain characteristics including: (1) retention of final

48. Bruce N. Shibles, *Implications of an International Legal Standard for Transboundary Management of Gulf of Maine-Georges Bank Fishery Resources*, 1 OCEAN & COASTAL L.J. 1, 2 (1994).

49. LIBECAP, *supra* note 6, at 10.

50. *Id.* at 14.

51. *Id.* at 15.

management authority by the government; (2) granting of legal rights to use and benefit from certain natural resources, in exchange for local communities assuming greater management responsibility; and (3) the communal need to acquire some form of recognized legal personality such as a cooperative or a nonprofit corporation.⁵²

VI. THE GEORGES BANK HOOK SECTOR

So what happened in the case of the Georges Bank Cod Hook Sector? How and why was it created? To know the answer to these questions, we need to explore the connection between the Georges Bank Cod Hook Sector and the private nonprofit organization that helped bring it into existence.

The Cape Cod Commercial Hook Fishermen's Association (CCCHFA) was formed in 1991 by a small group of local residents. "From an ad hoc committee of fishermen who met over beers to discuss the fate and future of their industry, the 'Hook,' as its staff and members call it, has evolved . . . into a formalized entity with 2,500 members—215 of whom are commercial fishermen."⁵³ Members are divided into two main categories: (1) concerned coastal residents or business owners, and (2) industry members (with minimum annual dues of \$500 for Captains and boat owners and \$100 for other industry members). Noteworthy is that "[i]ndustry members must be in good standing to participate in CCCHFA programs, including cooperative research."⁵⁴

The CCCHFA (a private nonprofit organization incorporated in North Chatham, Massachusetts)⁵⁵ assists the Georges Bank Hook Sector with implementation of the Sector approach. According to its Web site, the CCCHFA's purposes are "to promote sustainable fisheries for the future, to educate concerned citizens and lawmakers about the complexity of maintaining a small scale commercial fishing business and to encourage collaborations between fishermen and scientists in order to maximize participation in the management process."⁵⁶ The organization stresses that "traditional fishing communities are facing the threat of

52. Ctr. for Int'l Envtl. Law et al., *Whose Resources? Whose Common Good? Towards a New Paradigm of Environmental Justice and the National Interest in Indonesia* 2, 9-10, 14 (Jan. 2002), available at http://www.ciel.org/Publications/Whose_Resources_3-27-02.pdf.

53. Jennifer C. Berkshire, *A Nonprofit Leader Navigates Controversy While Preserving a Way of Life*, CHRON. PHILANTHROPY, Sept. 2, 2004, at 20.

54. Cape Cod Commercial Hook Fishermen's Ass'n, *Become a CCCHFA Member*, http://www.ccchfa.org/pages/about_us/31/ (last visited Jan. 20, 2007).

55. Guidestar, <http://www.guidestar.org> (search "Find Nonprofits" for "Cape Cod Commercial Hook Fishermen's Association") (last visited Jan. 20, 2007).

56. CCCHFA, *Welcome*, <http://www.ccchfa.org> (last visited Jan. 28, 2007).

extinction. . . . In ports like Chatham and Harwich, fishing is not merely an occupation; it is a way of life.”⁵⁷ As a 501(c)(3) not-for-profit corporation, the CCCHFA is eligible to receive tax-deductible donations for its programs, and in the year 2004 it had a budget of approximately \$1.6 million dollars consisting of revenues from the federal government (for cooperative research between fishermen and scientists), foundations, and individuals.⁵⁸ It is unclear whether the Georges Bank Cod Hook Sector would have come into existence without the prior formation of and stimulus provided by the CCCHFA or some such similar entity.

The assistance provided to the Georges Bank Hook Sector by the CCCHFA is substantial, and is exemplified by the fact that the current Sector Manager of the Georges Bank Hook Sector is one of the staff members of the CCCHFA.⁵⁹ Although the Georges Bank Cod Hook Sector has set the goal of covering its costs with membership fees, this was not done in the 2004 fishing year (May 1, 2004 thru April 30, 2005).⁶⁰ It appears that the CCCHFA is still subsidizing the Georges Bank Cod Hook Sector to a significant degree. The Georges Bank Cod Hook Sector 2004 Annual Report to the New England Fisheries Management Council notes that “the Hook Sector must pay for services such as the Sector Manager, monitoring Sector landings, enforcing Sector rules, and holding regular Sector meetings.”⁶¹ Because all of these services were carried out by the Hook Sector in 2004,⁶² it must be assumed that outside sources of funding were used to do so. The question then is whether the Georges Bank Cod Hook Sector is financially viable on its own. Or does it require the assistance of outside funding, and perhaps even human organizational support, as has been provided by the CCCHFA for its continued existence? Finally, one should note that the costs of the Georges Bank Hook Sector may decrease with time, as they take advantage of the organizational learning required to keep costs to a minimum. Similarly, future Sectors may benefit from the lessons learned by the Georges Bank Hook Sector, including in the area of cost control and financial sustainability.

57. CCCHFA, Welcome, <http://www.ccchfa.org> (last visited Jan. 20, 2007).

58. CCCHFA, ANNUAL REPORT 2004, at 11 (2005), *available at* http://www.ccchfa.org/pages/media_center/42/pages/files/AnnualReport2004.pdf [hereinafter ANNUAL REPORT 2004].

59. CCCHFA, FRC Activities, <http://www.ccchfa.org/pages/1/60/> (last visited Jan. 20, 2007).

60. GEORGES BANK HOOK SECTOR, GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT TO NEFMC 19 (2005), *available at* <http://www.ccchfa.org/pages/4/25/> (download report through the “here” hyperlink).

61. *Id.*

62. *Id.*

Another important factor leading to the creation of the Georges Bank Cod Hook Sector (besides support from the CCCHFA) was the prediction of serious adverse economic effects for the vessels fishing out of Chatham and Harwichport, in particular from the impending amendment 13 to the New England Fisheries Management Council's groundfish management plan. When presented with the Sector option as an alternative, enough local fishermen from Chatham and Harwichport preferred it.⁶³ This descriptive account of the formation of the Georges Bank Cod Hook Sector comports nicely with Libecap's argument that "[i]n considering whether or not to support proposed changes in property rights at any time, the bargaining parties implicitly compare their expected income stream under the status quo with that offered by the new arrangement."⁶⁴

VII. IS THE GEORGES BANK COD HOOK SECTOR A MODEL FISHERY?

In answering this question, one should realize that certain factors are beyond the control of the fishermen who manage and the regulators who oversee the Georges Bank Cod Hook Sector. Regardless of how well the Sector's fisheries management regime performs, the Atlantic cod may not be restored to high levels of sustainable productivity anytime soon. This prospect is borne out by amendment 13 to the Fisheries Management Plan wherein the New England Fisheries Management Council adopted a plan to rebuild Atlantic cod stocks by the year 2026 (this deadline exceeds the normally required ten-year time frame due to the cod's "unique biological circumstances").⁶⁵ Another possibility is that nature will assert itself after anthropogenic alteration of the cod's ecosystems. Kurlansky points out that other species might take over the cod's ecological niche by surviving and thriving in areas formerly dominated by cod, and he notes that "[s]ome biologists worry that rays, skates, and dog-fish, which are small sharks, may already be moving in."⁶⁶ A further factor that has traditionally been beyond the control of fishermen is the significant degree of scientific uncertainty in fisheries science.⁶⁷ In the case of the Georges Bank Cod Hook Sector, however, the fishermen have proactively cooperated with scientists to increase

63. *Id.* at 5-6.

64. LIBECAP, *supra* note 6, at 19.

65. Fleming et al., *supra* note 4, at 600.

66. KURLANSKY, *supra* note 1, at 202.

67. EARLE, *supra* note 14, at 192 (referring to fishing quotas as based on highly uncertain information).

both sides' mutual understanding of the fisheries and ecosystems under management.⁶⁸

Regardless of the aforementioned constraints, the need for innovative models of successful fisheries management is evident. The Georges Bank Cod Hook Sector has expressed that its "members and Staff have worked diligently to set forth the GB Hook Sector as a strong model for the future of Groundfish management in New England."⁶⁹ Convincing the New England Regional Council and NMFS to make room for the Sector approach in their regulatory system was a major success for the CCCHFA.⁷⁰ As described by one commentator:

In one of the more progressive approaches adopted by the NEFMC, Amendment 13 introduces the concept of sector allocations to the region. This option allows fishermen to self-organize and develop self-managed programs for a prescribed allocation of quota in the fishery based on their fishing history . . . [and] was developed by a relatively small boat fishery that primarily uses hook-and-line gear to fish for cod off Cape Cod. This group formed a sector and had its plan adopted in Amendment 13 Additional sectors may be formed and approved through future framework actions.⁷¹

Amendment 13 to the New England Groundfish Management Plan came into effect on May 1, 2004, the first day of the 2004 fishing year. It allows any person to submit a Sector allocation proposal for a group of fishing vessels to the Regional Council. If the Council approves, it initiates a framework for that Sector with either a hard quota (i.e., total allowable catch) or a maximum days-at-sea allocation combined with a target allowable catch.⁷²

No Sector may be allocated more than twenty percent of the fishing rights for any stock.⁷³ This rule may evidence the Regional Council's desire to comply with National Standard 4's nondiscrimination requirement by maintaining distributional equity among the five New England states (20% of quota x 5 states = 100% of quota). Allocation of catch or effort is based upon documented landings of the stock in question over the five-year period prior to submission of the Sector

68. Cape Cod Commercial Hook Fishermen's Ass'n, Cooperative Research, <http://www.ccchfa.org/pages/2> (last visited Jan. 20, 2007).

69. GEORGES BANK HOOK SECTOR, *supra* note 60, at 20.

70. Fleming et al., *supra* note 4, at 602.

71. *Id.*

72. NOAA Fisheries Northeast Region Information Sheet No. 19, Sector Allocation Proposal Requirements and Procedures 1 (May 1, 2004), *available at* <http://www.nero.noaa.gov/nero/regs/infodocs/Info19.pdf>.

73. *Id.*

proposal.⁷⁴ For example, hook fishermen caught about twenty percent of Georges Bank cod between 1996 to 2001 and were thus allocated the right to land twenty percent of allowable Georges Bank cod (for fishing years 2004-2007).⁷⁵

Each Sector must submit a binding Operations Plan and a Sector Contract for approval by the NMFS Regional Administrator. The Operations Plan details the methods the Sector will use to comply with the quota as well as the MSA's conservation requirements (e.g., minimization of bycatch). The Sector Contract is formulated and signed by all the Sector members as a way of establishing intra-membership binding commitments. This intra-membership contract may serve to incentivize peer pressure for compliance with federal fishery regulations since all members are jointly and severally liable for any violations of federal fisheries law. To complete our overview of amendment 13, it should be said that the NMFS Regional Administrator maintains discretion to exempt Sector members from certain regulations as necessary for the implementation of the Sector's Operations Plan.⁷⁶

For the 2004 fishing year, the Georges Bank Cod Hook Sector formulated an Operations Plan with two primary restrictions: (1) only nonautomated hook gear could be used, and (2) the annual hard quota was divided equally into monthly hard quotas. Their plan also included steps to achieve compliance with the MSA and with the New England Regional Council's groundfish management plan (e.g., monitoring landings).⁷⁷

Fifty-eight vessels, most of which sail from Chatham or Harwichport and also fish for species other than cod outside the Sector's system, participated in the Georges Bank Cod Hook Sector during the 2004 fishing year.⁷⁸ How well did they do?

I utilize a four-part test to assess the Georges Bank Cod Hook Sector's viability as a model for other fisheries. First, I assess performance with regard to use. Second, conservation performance is analyzed. Third, I address the viability of the Sector approach for preserving local fishing communities and cultures. And fourth, I evaluate performance with regard to organizational viability.

74. Letter from Patricia A. Kurkul, Regional Administrator, Nat'l Marine Fisheries Serv., to Northeast (NE) Multispecies Permit Holder, *available at* <http://www.nero.noaa/amend13/ph1/amend13.pdf> (last visited Mar. 29, 2007).

75. E-mail from Paul Parker, *supra* note 18.

76. NOAA Fisheries Northeast Region Information Sheet No. 19, *supra* note 72, at 3.

77. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 3.

78. *Id.*

A. *Use Outcomes*

With regard to use performance, the unfortunate truth is that the Sector only landed about one third of its allocated quota for 2004.⁷⁹ Because NMFS approved the same allocation to the Georges Bank Cod Hook Sector for the years 2004-2007,⁸⁰ the Sector has two more years in which to try to land more cod. Despite this two year window, the Sector's members seem extremely concerned over the scarcity of cod. As the Sector's annual report to the New England Regional Council states, "[t]he biggest worry of Hook Sector members is the low abundance of cod, especially during the winter months."⁸¹

The Sector's strategy for improving economic (or use) performance is to switch from stocks of concern such as cod, to healthier stocks such as haddock. Ironically, the haddock stocks themselves experienced a major collapse in the early 1990s, leading to emergency closures of haddock fishing grounds by the federal government from 1994 to the present.⁸² Nonetheless, NFMS granted the Sector exclusive fishing rights to land haddock in "Closed Area I" during 2004.⁸³ An article in the *Cape Cod Times* explained why:

Access to "Closed Area I" is their reward for figuring out how to cut back on catching endangered species such as cod Last winter, fishermen from the Hook Sector participated in an experiment to see how much haddock was in the closed area and if they could develop a bait that caught mostly haddock but very little or no cod. The boats found that herring and a manufactured bait both worked. Their reward is access until December 31 to the closed area and its potential catch of 2.2 million pounds of haddock.⁸⁴

Access to this haddock Special Access Program was key to the Sector's economic viability in 2004 as cod revenues were minimal and haddock revenues were significant.⁸⁵ In 2005, the haddock Special Access Program has expanded to include all hook fishermen, not just those in the Sector.⁸⁶

79. *Id.* at 12. Of the 371 metric tons that the Sector was allowed to land under its total allowable catch for 2004, it landed only 130 metric tons (286,190 pounds).

80. NOAA Fisheries Northeast Region Information Sheet No. 19, *supra* note 72, at 1.

81. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 22.

82. Doug Fraser, *Fishery Managers Grant Cape Cod Fishing Boats Access to Closed Haddock Grounds*, CAPE COD TIMES, Nov. 30, 2004, available at 2004 WLNR 12794276.

83. *Id.*

84. *Id.*

85. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 4.

86. *Id.* at 18.

Another supplementary form of revenue for Sector fishermen was cooperative research financing channeled by the federal government through the CCCHFA. Paul Parker, the CCCHFA's Executive Director, was quoted in the *Chronicle of Philanthropy* to the effect that federal funding of cooperative research "provided an economic lifeline for many of the group's fishermen members. . . . Federal money is used to pay them to collect data and conduct tagging research at a time when tight regulations have drastically cut back the days they can spend fishing."⁸⁷ In 2004, the CCCHFA received approximately \$1.2 million in federal research money.⁸⁸

The Sector's engagement with scientists on federally financed fisheries research, for which they are financially compensated, certainly argues for its being a model fishery. Moreover, the division of annual hard quotas into monthly hard quotas is an idea that could be easily replicated as a measure to control derby fishing in newly formed Sectors.

On the other hand, the allocation of exclusive fishing rights for haddock to these Massachusetts fishermen resulted in anger among Maine fishermen. Senator Olympia Snowe of Maine issued a press release describing the Sector-exclusive haddock Special Access Program as "terrible news for Maine's fishermen."⁸⁹ As mentioned earlier, National Standard 4 may play a significant role in allocating fishing rights among the different states within regions.

B. Conservation Outcomes

With regard to conservation outcomes, the Georges Bank Cod Hook Sector appears to have performed remarkably well in many areas. For example, in the haddock Special Access Program over a million pounds of haddock were caught and bycatch of cod was kept to less than twenty thousand pounds (less than two percent of the total).⁹⁰ As explained in the Annual Report of the Georges Bank Hook Sector, the fishermen were involved in cooperative research with scientists that led to their receiving exclusive access to Closed Area I fishing: "The fishermen thought that if they used baits more attractive to haddock than cod, and fished in certain places and times, they could harvest a very clean catch of haddock."⁹¹

87. Berkshire, *supra* note 53, at 21.

88. 2004 ANNUAL REPORT, *supra* note 58, at 11.

89. Press Release, Senator Olympia Snowe, NMFS Must Allow Maine's Fishermen To Participate in Special Haddock Fishery (Nov. 18, 2004), *available at* <http://snowe.senate.gov/public/> (key search "haddock" and scroll down to Nov. 18, 2004 press release).

90. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 4.

91. *Id.* at 14.

This is an excellent example of how fishermen's empirical knowledge can help advance scientific understanding of fisheries.⁹²

From a conservation standpoint, the low amount of cod caught in 2004 was a success, although as mentioned earlier this outcome was a negative one from a use perspective and was not desired by the fishermen.

Other significant conservation achievements for the Sector included an observer coverage rate of 22.4% and participation in an Electronic Monitoring pilot research project.⁹³ Prior to a recent judicial order to increase observer coverage to five percent, NMFS provided observer coverage of approximately two percent for the New England groundfish fishery.⁹⁴ The Sector Manager played an important role in communicating "with AIS and the Fisheries Sampling Branch in order to assist in coordinating coverage [by observers]."⁹⁵ The results of the electronic monitoring pilot research were quite interesting as well. Catch estimates captured by video footage were within five percent of the figure tallied by observers. Video and other forms of electronic monitoring could eventually replace the current practice of having independent observers go out with the fishing vessels to impartially track data. Electronic monitoring "offers advantages over observer programs including lower cost, labor savings, logistical efficiency, fleet suitability, and increased industry acceptance."⁹⁶

The Georges Bank Cod Hook Sector's strong emphasis on cooperative research is a model that should be replicated wherever possible, in order to improve conservation outcomes as well as to address local fishermen's economic needs. Increasing the amount of federal funding available for cooperative research projects such as these will help keep local fishing communities viable. Simultaneously, federal research dollars will be leveraged by the fishermen's ability to contribute the use of their pre-existing capital—their boats. Greater funding for cooperative research is one method of addressing the problem of overcapitalization in the fishing industry, as the capital is put to good use. As the CCCHFA

92. See *id.* (noting that 100% coverage by independent observers was required in experiment, which is quite sensible given the temptation for interested parties to manipulate research in a way that favors their desired outcomes).

93. *Id.* at 16.

94. Fleming et al., *supra* note 4, at 615 (citing Declaration of Michael P. Sissenwine at 11, *Conservation Law Found. v. Evans*, 209 F. Supp. 2d 1 (D.D.C. Apr. 1, 2002)).

95. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 16.

96. *Id.*

Web site points out, “the skill, empirical knowledge and equipment of commercial fishermen are in high demand for research projects.”⁹⁷

The total allowable catch restriction (i.e., hard quota) employed by the Sector is another positive feature from a conservationist perspective. Reliance on target allowable catches (i.e., soft quotas) and input controls (e.g., restricting days at sea) have proven ineffective at limiting catches of Atlantic cod in New England, so much so that for seven consecutive years New England exceeded its target allowable catch for cod. In some years, the total amount of cod landed was actually double or triple the target allowable catch.⁹⁸

A strong conservation ethic is modeled by the Sector’s fishermen and by the leadership of the private nonprofit organization assisting the Sector. In 2001, the CCCHFA’s Executive Director testified before the United States Senate Subcommittee on Oceans and Fisheries that “economic impacts must be considered [but] cannot take precedence over the Magnuson-Stevens Act’s mandate to conserve fish.”⁹⁹ A further example of the CCCHFA’s prioritization of conservation was its intervening in a federal court lawsuit alleging that NMFS had failed to implement a management plan meeting MSA requirements. This was apparently the first time that an organization of fishermen in the United States had intervened in such a case on behalf of the conservation plaintiffs.¹⁰⁰

One potentially negative outcome of the Sector approach is the discretion afforded to NMFS to exempt Sector fishermen from closed area restrictions. But this discretion may be unavoidable if what is sought is a regulatory system with greater flexibility to reward and punish behavior. The haddock Special Access Program was indeed a great reward.

C. *Local Fishing Community Preservation Outcomes*

With regards to preserving local fishing communities and cultures, it is difficult to evaluate whether the Georges Bank Cod Hook Sector is a model fishery. To the extent that the Sector approach contributed to the continuing economic viability of fishing for Chatham and Harwichport fishermen, it was successful. It does appear that the Sector’s fishermen

97. Cape Cod Commercial Hook Fishermen’s Ass’n, Cooperative Research, <http://www.cchfa.org/pages/2/> (last visited Jan. 28, 2007).

98. Conservation Law Found., *Words To Fish By*, CONSERVATION MATTERS (Winter 2004), <http://www.clf.org/general/index.asp?id=379>.

99. Laurence, *supra* note 43, at 833.

100. Fleming et al., *supra* note 4, at 591.

did better for themselves under the Sector approach than they would have done without it, given the dire economic impact predictions of amendment 13 (without the Sector approach) on Chatham and Harwich fishermen. Cooperative research funding channeled from the federal government through a private nonprofit corporation, as well as the haddock Special Access Program, were important to the Sector fishermen's financial viability in 2004.

Nonetheless, the fishermen are still worried about their futures as well as the future of the cod.¹⁰¹ And yet, the fact that "most of the New England fleet is individually or family owned and operated"¹⁰² attests to the durability of New England's local fishing economies and cultures in the face of economic competition from fishing corporations that benefit from economies of scale.

D. Organizational Viability Outcomes

Is the Georges Bank Cod Hook Sector a financially viable organization? Or does its continued survival depend upon the financial and human resource inputs provided by the Cape Cod Commercial Hook Fishermen's Association?

If the Sector's membership fee revenues can cover the Sector's total expenses, then it becomes much easier to envision the Sector approach as a model fishery. Another alternative is for the federal government to provide for a predictable budgetary allotment to cover the operational costs of Sectors. Because the fishermen in a Sector put significant amounts of time and effort into managing their fisheries (thus significantly reducing the managerial loads of the federal fisheries bureaucracy), it is not unreasonable to expect that the federal government should pay them for their management services. Libecap's observation that contracting costs can prevent the definition and enforcement of property rights in natural resources¹⁰³ is of great relevance to the case of the Georges Bank Cod Hook Sector. If the Georges Bank Cod Hook Sector's contracting costs exceed the Sector's revenues then they are not financially viable, at least not for long. The same can be said for the Sector approach as a whole.

As noted earlier, community-based approaches to natural resources management often require that the local community (or a group within the community) acquire some form of recognized legal personality such

101. GEORGES BANK HOOK SECTOR 2004 ANNUAL REPORT, *supra* note 60, at 22.

102. Shelley et al., *supra* note 26, at 224.

103. LIBECAP, *supra* note 6, at 13.

as that provided by a nonprofit corporation. Sectors, in this sense, may be no different than the many community-based approaches to natural resource management implemented around the world.¹⁰⁴ This acquisition of legal personality—be it as a cooperative, nonprofit corporation or other organizational form—represents a significant, though not insurmountable, cost.

VIII. CONCLUSION: THE SECTOR APPROACH AS A MODEL FOR LOCAL FISHERIES MANAGEMENT

The Georges Bank Cod Hook Sector approach may only be replicable in communities sharing some of the characteristics of the local fishing communities of Cape Cod. To reiterate, Ostrom's research has found that groups which are successful in implementing community-based natural resource management share the following characteristics: (1) small in size, (2) stable, (3) strong sense of community, (4) highly dependent on the resource in question, and (5) strong conservation ethic. The local Cape Cod fishermen who formed the Georges Bank Cod Hook Sector certainly appear to share these same characteristics; however, not all fishermen (or fishing companies) do.

The extent to which the Georges Bank Cod Hook Sector is a model fishery may depend upon the extent to which such groups of fishermen continue to exist. At least in New England, small fishing communities remain an integral part of the landscape and are thus available as a potential source of demand for increased use of the Sector approach.¹⁰⁵

104. See Ctr. for Int'l Envtl. Law, *supra* note 52.

105. U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 20 (2004) (noting that one of the Commission's six principal recommendations is to expand the use of "dedicated access privileges" such as sectors).