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# Implementation of the National Ocean Policy:

## Lessons from New England

Anne Hayden\*

### INTRODUCTION

In 2010, President Barack Obama established, through executive order, the nation's first national ocean policy. The implementation of the policy is intended to replace two hundred years of *ad hoc* policy development with a comprehensive approach to ocean governance; one that will provide guidance for the use, development, and protection of the US Exclusive Economic Zone (EEZ), coordinate the marine related efforts of myriad governmental agencies, and limit use conflicts among the growing demands for our ocean resources. To some degree, establishment of a national ocean policy represents a restatement of federal authority over the EEZ, first codified in the passage of the Fisheries Conservation and Management Act (FCMA) in 1976. As such, it risks reinforcing assumptions regarding the efficacy of rationalized management that have hindered the conservation and restoration of fish stocks in the Northeast and that are unlikely to result in effective maritime multiple use management.

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New England's fisheries crisis and recent ocean planning initiatives provide insights regarding effective implementation of the National Ocean Policy.

The twentieth century saw the rise of science as a way of understanding the natural world and the development of professional resource management as the most appropriate mechanism for both optimizing natural production for human use and resolving issues of over and misuse of natural resources. The prevailing view was deterministic and assumed that the natural world operated as a steady state: science need only to understand the mathematical relationships underlying natural processes in order to manipulate such processes for the benefit of mankind. The concept of maximum sustainable yield, the basis for much of our current fisheries management paradigm, sprang from this well.

#### FEDERALIZATION OF FISHERIES MANAGEMENT

Impetus for passage of the FCMA, passed in 1976, included the desire to capture the economic benefits of rich coastal shelf fisheries for Americans rather than foreigners, the need to restore stocks depleted by foreign fishing fleets, an interest in incentivizing expansion of domestic fishing fleets, and the belief that recently developed principles of scientific management could be applied to maximize the benefits of fisheries. Absent fishing pressure from foreign fleets, stocks began to recover only to be decimated in turn by the newly capitalized American fishing fleet.

Attempts to address the failure of management to stabilize harvests include several amendments to the FCMA, among the most significant of which were the Sustainable Fisheries Act of 1996, in which the FCMA was renamed the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA), and the Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act of 2006. Each sought to address the weaknesses of the Act by further privileging the role of science in setting management targets and by establishing legally enforceable standards for preventing overharvesting and for rebuilding fish stocks.

#### LESSONS LEARNED

Several developments in the decades since the rise to

prominence of federalized professional natural resource management now challenge the current management paradigm and suggest alternatives to the top down, data-driven approach currently embodied in the MSFCMA.

First, research on the structure of groundfish stocks in New England has revealed that previous assumptions about the well-mixed nature of such stocks are unfounded. Rather than being part of one large stock, as assumed during implementation of the FCMA, groundfish stocks in the Gulf of Maine are now known to be comprised of a series of substocks.<sup>1</sup> Broad-scale stock assessments and fishery management plans fail to recognize and therefore to protect many of these substocks. Second, ecologists now view ecosystems as complex and dynamic rather than as functioning as a series of steady state equilibria. Interactions across temporal and spatial ecological scales introduce irresolvable uncertainty into ecosystem dynamics confounding the efforts to predict stock abundance that have been the foundation of professional resource management. While the concept of maximum sustainable yield (MSY) has been useful as a teaching tool, its limitations as a regulatory tool have been well documented.<sup>2</sup> Questions regarding the utility of MSY as a regulatory tool were raised even as the FCMA was being implemented.<sup>3</sup> Third, it is now accepted that humans are part of the ecosystem. The logistic, surplus production models that are the basis of our current fisheries management paradigm define the role of fishermen in terms of a simplistic fishing mortality factor. Fishing behavior is understood to be a complex function of many elements, including market prices, operating costs, availability of capital, opportunity costs, fishers' ecological knowledge, cultural practices, as well as the effect of regulations on all of the above. Not only are fishermen part of the ecosystem but fisheries managers, consumers, and competing marine users, including recreational fishermen, environmentalists, aquaculturists, and, more recently, energy interests, all play a role

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1. See Edward P. Ames, *Atlantic Cod Stock Structure in the Gulf of Maine*, 29 FISHERIES 10, 16 (2004).

2. See e.g., Carmel Finley, *The Social Construction of Fishing, 1949*, 14 ECOLOGY & SOC'Y (2009).

3. See P.A. Larkin, *An Epitaph for the Concept of Maximum Sustainable Yield*, 106 TRANSACTIONS AM. FISHERIES SOC'Y 1, 4-5 (1977).

in affecting the dynamics of marine ecosystems, directly or indirectly. Fourth, research regarding common property resources has shown that Garrett Hardin's assertion that only privatization or government regulation can prevent tragedies of the commons represents a false dichotomy.<sup>4</sup> Studies have documented myriad examples of cooperation among user groups to sustain the use of common property resources: most limit access to the resource, a possibility not anticipated by Hardin.<sup>5</sup> Finally, federal fisheries management has failed in New England to restore or protect many fish stocks; as a result, thousands of fishermen have lost their livelihoods and communities all along the New England coast have shifted from economies based on diverse fisheries to dependence on lobster fishing and tourism.

While it is clear that overharvesting, well underway by the time the FCMA was passed, caused the collapse of New England's groundfish stocks, it is less well understood that federal policies contributed to the overharvesting that occurred after the FCMA was implemented. Just as Hardin could not imagine that individual users could agree among themselves to limit resource use, current management paradigms assume that fishermen act only as individuals pursuing their own self-interest. Focus on single species management and regulation undercuts the conservation incentive of small-scale diversified fisheries by reinforcing a shift to larger scale, "roving bandit" fisheries.<sup>6</sup> Management at the scale of the Gulf of Maine allowed open access on substocks resulting in local extirpations and sharply reducing the viability of the small boat fleet. Historical analysis reveals that such substocks at one time collectively supported groundfish landings in the Gulf of Maine an order of magnitude higher than now occurs, all landed with sail powered vessels using hook and line technology.<sup>7</sup> While some groundfish stocks in the Gulf of Maine are showing signs of recovery, federal policies limit the

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4. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1247 (1968).

5. See ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* *passim* (1990).

6. See James A. Wilson, *Matching Social and Ecological Systems in Complex Ocean Fisheries*, 11 ECOLOGY & SOC'Y (2006).

7. See Ames, *supra* note 1, at 22; Karen E. Alexander et al., *Gulf of Maine Cod in 1861: Historical Analysis of Fishery Logbooks, with Ecosystem Implications*, 10 FISH & FISHERIES 428, 444 (2009).

likelihood that stocks can be restored to historical levels.

#### AN INTEGRATIVE APPROACH TO MANAGEMENT

Implementation of the National Ocean Policy presents an opportunity to reframe our approach to management of federal waters to reflect advances in our understanding of the interaction between resource users and marine ecosystems. An effective approach reinvisions the interactions of humans and the marine environment as socio-ecological systems.<sup>8</sup> Such an approach replaces a vision of management as exogenous manipulation of ecosystem components with one that acknowledges the complex and multi-scalar interdependence of social and ecological processes.

Prescriptive management is replaced by an iterative process of trial and error known as adaptive management: management actions are implemented at a variety of scales (taking into account cross-scale linkages), social and natural systems are monitored for effects, and the results applied to the timely adjustment of management strategies. An adaptive approach allows for management to adjust not only to unanticipated changes within the system, but also to the effects of exogenous forces such as climate change and market forces.

Effective management must also reflect the social behavior that emerges as a result of user groups' interactions with marine ecosystems. Co-management, in which government shares authority for oversight of resource management with resource users, has been shown to be effective in creating incentives for user groups to share data, cooperate within the group to achieve conservation goals, and increase compliance with regional and federal requirements. Matching the scale of co-management to the scale of the resource and allowing users a role in decision-making regarding resource use ensures that users benefit from their efforts to conserve, and increases incentives for meaningful participation in management.

From an integrated, socio-ecological perspective, natural resource management is recognized as at least as much as a problem of social organization as one of science. Management that

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8. NAVIGATING SOCIAL-ECOLOGICAL SYSTEMS: BUILDING RESILIENCE FOR COMPLEXITY AND CHANGE 3 (Fikret Berkes et al. eds., 2003).

is adaptive and collaborative builds on institutions, rules, and norms, integrating user social structure into the management process.<sup>9</sup>

One of the most challenging aspects of establishing adaptive co-management of natural resources is that it is not effectively imposed on a socio-ecological system but must be allowed to emerge from the interactions of user groups operating at the scale of the ecosystem properties on which they depend.<sup>10</sup> The MSFCMA prescribed co-management of fisheries, establishing regional councils designed to provide industry input into regulations. The council system has failed to protect stocks because the scale of management does not reflect the ecological scale of the stocks and because the council appointment process and operating rules are unrelated to the social organization of New England's fishing industry. (A recent effort to reform management to reflect social organization among fishermen is described below.) Co-management is not a panacea for effective management of common property resources,<sup>11</sup> however, it does provide opportunities for incentivizing conservation among users that would otherwise be lost.

#### IMPLEMENTATION OF THE NATIONAL OCEAN POLICY

Plans for implementation of the National Ocean Policy focus on coordination of government agencies, scientific research, and coastal and marine spatial planning (CMSP) as the means for achieving effective, comprehensive, ecosystem-based ocean management.<sup>12</sup> For the purposes of CMSP, the nation's marine waters are divided into nine regions, parallel to, but independent of, the jurisdictions of the MSFMCA's fishery management councils (with the addition of a council representing the Great

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9. See Derek R. Armitage et al., *Adaptive Co-Management for Social-Ecological Complexity*, 7 FRONTIERS ECOLOGY & ENV'T 95, 100 (2009); Timothy R. McClanahan et al., *Healing Small-Scale Fisheries by Facilitating Complex Socio-Ecological Systems*, 19 REV. FISH BIOLOGY & FISHERIES 33, 42 (2009).

10. Jack Ruitenbeek & Cynthia Cartier, *The Invisible Wand: Adaptive Co-Management as an Emergent Strategy in Complex Bio-economic Systems* 33 (Ctr. for Int'l Forestry Research, Occasional Paper No. 34, 2001).

11. Elinor Ostrom, *A Diagnostic Approach for Going Beyond Panaceas*, 104 PROC. NAT'L ACAD. SCI. 15176, 15177 (2007).

12. THE WHITE HOUSE COUNCIL ON ENVTL. QUALITY, FINAL RECOMMENDATIONS OF THE INTERAGENCY OCEAN POLICY TASKFORCE 28 (2010).

Lakes). The goal of the National Ocean Policy is to coordinate the ocean-related actions of a wide range of government agencies; however, as planned, implementation of the policy is silent on how regional ocean planning will engage with previously established fisheries management and offshore energy licensing programs.

Proposals to implement CMSP in New England describe a science-driven effort that includes public participation and outreach to user groups.<sup>13</sup> As envisioned, CMSP treats users as outside the decision-making process, privileges science over users' ecological knowledge, and establishes large regions as the appropriate scale for management. These constraints are likely to limit meaningful participation by users in the planning process and hinder emergence of adaptive co-management.

Three initiatives in New England illustrate opportunities for incorporating principles of adaptive co-management into federal ocean planning. The Commonwealth of Massachusetts has developed an ocean management plan for state waters. Designed to reduce use conflicts and inform review of projects requiring state and federal permits, the plan is the first comprehensive effort in the nation to manage state waters. Federal agencies, such as the United States Geological Survey, participated in mapping resources of state interest for incorporation in the plan. The State of Rhode Island recently adopted a management plan for adjacent offshore waters. Driven by proposals for development of wind power, the plan represents Rhode Island's interests in, and knowledge of, waters off its coast. The plan is the first to have been recognized by the National Oceanic and Atmospheric Administration. Adoption of catch shares as a fisheries management tool in New England illustrates effective stakeholder participation at an even finer scale. The New England Fishery Management Council recently adopted an amendment to the groundfish management plan that allows for self-organization of fishermen into groups for the purpose of jointly managing fishing activities. The process, which allocates a percentage of the total allowable catch to each group, provides fishermen with the incentive to target high value fish, avoid by-catch and reduce

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13. NORTHEAST REGIONAL OCEAN COUNCIL, *ADVANCING COASTAL AND MARINE SPATIAL PLANNING IN THE NORTHEAST: NORTHEAST REGIONAL OCEAN COUNCIL (NROC) PROPOSAL TO NOAA* (December 10, 2010).



habitat impacts. The amendment was approved by the National Marine Fisheries Service. The role of the federal government in each of these three initiatives is a model for incorporation of finer scale, stakeholder driven input into a broad scale, federal planning effort.

#### CONCLUSION

Federal rationalization of American fisheries offers several lessons that should be heeded in implementation of the National Ocean Policy. With its focus on nine regional ocean councils and CMSP, implementation appears poised to replicate the same broad-scale, data driven approach that underlies the MSFCMA. As proposed, the National Ocean Policy does not preclude incorporation of mechanisms that would allow for development of adaptive co-management, including opportunities for identifying resources at a variety of ecological scales and allowing for the emergence of scale-related institutions that share authority and responsibility for management among federal, regional and local scales of governance. However, implementation will need to be modified in order to capture the potential benefits of adaptive co-management. To the extent that implementation builds on outdated assumptions regarding the primacy of science, professional management, and federalization of oversight, it is likely to limit the productivity of, and the collective benefits to be derived from, our nation's coastal and marine resources.