Ecosystem-Based Management Under the Magnuson-Stevens Act: Managing the Competing Interests of the Gulf of Mexico Red Snapper and Shrimp Fisheries

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I. Introduction

The U.S. commercial fishing industry's value exceeds $28 billion, while the recreational saltwater fishery is valued at around $20 billion annually.[2] Yet recent stock assessments estimate that approximately twenty-three percent of evaluated fisheries are overfished.[3] In the mid-1990s, two significant national ocean policy studies questioned the fate of United States' marine resources: the Pew Oceans Commission[4] and the U.S. Commission on Ocean Policy.[5] Both Commissions agreed that better management of marine resources necessitates implementation of an ecosystem-based approach through regionally coordinated mechanisms.[6] And more recently, the Interagency Ocean Policy Task Force created by President Obama echoed these sentiments in its Interim Report.[7] Although U.S. fishery management law provides authority for applying ecosystem-based management (EBM), decision-makers are often reluctant to invoke such measures.

The struggle to regulate effectively the competing interests of the Gulf of Mexico red snapper and shrimp fisheries embodies the challenges of achieving an ecosystem-based management approach under the existing regulatory framework. As early as 1988, scientists recognized that the Gulf of Mexico red snapper was overfished and depleted; identifying shrimp trawl bycatch as the primary source of mortality.[8] However, the Gulf Council continued to manage the fishery with complete disregard for regulation of shrimp bycatch until mandated to address the issue by a federal court in 2007.[9] As a Coastal Conservation Association (CCA) consultant to the Gulf Council remarked, "[t]rying to manage red snapper without addressing shrimp trawl bycatch is like trying to lower your electric bill by buying a more efficient toaster oven. Your electric bill isn't high because of

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[2] U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY: FINAL REPORT, 2 (2004), *available at* http://www.oceancommission.gov [hereinafter USCOP REPORT].

[3] NATIONAL MARINE FISHERIES SERVICE, 2008 REPORT TO CONGRESS: STATUS OF U.S. FISHERIES, 1 (2009), *available at* http://www.nmfs.noaa.gov/sfa/statusoffisheries/booklet_status_of_us_fisheries08.pdf . This does not account for stocks with an unknown status. *Id.*

[4] PEW OCEANS COMM'N, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE (2003), *available at* http://www.pewtrusts.org/pdf/env_pew_oceans_final_report.pdf [hereinafter PEW REPORT].

[5] USCOP REPORT, *supra* note 2.

[6] PEW REPORT, *supra* note 4, at 103-06; USCOP REPORT, *supra* note 2, at 5-9.

[7] THE WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY, INTERIM REPORT OF THE INTERAGENCY OCEAN POLICY TASK FORCE (2009), *available at* http://www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/Interimreport [hereinafter IOPTF INTERIM REPORT].

[8] SOUTHEAST DATA, ASSESSMENT, AND REVIEW 7, GULF OF MEXICO RED SNAPPER STOCK ASSESSMENT REPORT, 2 (2005), *available at* http://www.sefsc.noaa.gov/sedar/ [hereinafter SEDAR REPORT].

[9] Coastal Conservation Association v. Gutierrez, 512 F.Supp.2d 896, 899 (S.D. Tex. 2007).

your toaster oven; it's the large and leaky air conditioning unit running around the clock."[10] Both fisheries need cohesive joint management that incorporates principles of ecosystem-based management. The Gulf of Mexico red snapper and shrimp fisheries provide an illustrative case study of the inadequacies of single-species management.

Looking through the lens of these two fisheries, this article will first examine current domestic fishery management laws and recent proposals for improvement. Section II provides an overview of current U.S. fishery regulations. Section III discusses the role of EBM in fishery regulation and its key tenets, along with legal authority and impediments to implementation. Section IV provides a history of red snapper management efforts in the Gulf and the challenges of regulating the competing interest of the two fisheries. Finally, Section V examines efforts toward EBM in the Gulf of Mexico red snapper and shrimp fisheries including proposals for further advancement.

II. U.S. Fishery Management

As discussed in more detail below, domestic fisheries in the U.S. are regulated separately at the state and federal level. Decisions at the federal level involve regional management councils, whereas states generally regulate fisheries without consideration for impacts to the fishery in neighboring waters. Regional commissions, however, provide some level of federal/state coordination.

A. Federal Management

1. Magnuson-Stevens Fishery Conservation and Management Act of 1976

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) governs fishery management in federal waters within the U.S. Exclusive Economic Zone (EEZ).[11] Enacted in 1976, the MSA established "[a] national program for the conservation and management of fisheries resources in the United States" with the purpose "to prevent overfishing, to rebuild overfished fish stocks, to insure conservation, and to realize the full potential of the Nation's fishery resources."[12] The MSA charged the Secretary of Commerce, by and through the National Marine Fisheries Service (NMFS), to regulate domestic marine fisheries when "necessary and appropriate."[13] Eight regional councils were created to develop fishery management plans (FMPs) for those fisheries requiring "conservation and management."[14]

2. Sustainable Fisheries Act of 1996

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[10] Remarks of Russell Nelson, CCA consultant to the Gulf Council, CCA, *Gulf Red Snapper – The State of the Fishery,* http://www.joincca.org/Snapper%20position.html (last visited Dec. 16, 2009).
[11] JOSEPH J. KALO, ET AL., COASTAL AND OCEAN LAW, 390 (3rd ed. 2007). The U.S. EEZ extends 200 nautical miles offshore. The U.S. proclaimed its 200-mile EEZ in 1983 and extended its territorial sea to 12 miles in 1998. These actions followed the adoption of the 1982 Convention at the close of UNCLOS (United Nations Convention on the Law of the Sea) III. *Id.*
[12] 16 U.S.C. § 1801(a)(6).
[13] *Id.* §§ 1811, 1853.
[14] *Id.* §§ 1852(h)(1), 1854(c)(1)(A); *see also id.* § 1802(5) (defining "conservation and management").

In response to the collapse of several important domestic fisheries, Congress amended the MSA through the 1996 Sustainable Fisheries Act (SFA).[15] Under the SFA, the focus of the MSA shifted "from 'Americanization' of all U.S. fisheries to the conservation and rebuilding of overfished stocks."[16] To achieve this goal, the SFA added new requirements: (1) conserve fish stocks, address overfishing, and minimize bycatch; (2) assure fair and balanced regional management council membership; (3) impose a moratorium on new individual fishing quota programs; (4) improve social benefits for traditional small-scale fishers; and (5) provide increased protection of fish habitat.[17] These measures were intended to incorporate the precautionary approach and sustainable development into fishery management.[18] Unfortunately, the overarching emphasis remained on allowance of fishing[19] doing little to curtail what has been characterized as "a national addiction to unsustainable fishing."[20]

3. Magnuson-Stevens Reauthorization Act of 2006

Passed by Congress in 2006 and signed into law in early January 2007, the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (FCMRA) is the latest effort to address the national fish crisis.[21] To that end, the FCMRA addresses the timeline for rebuilding overfished stocks;[22] establishes a regional cooperative research and monitoring program and a regional ecosystem study;[23] strengthens the role of science in decision-making;[24] develops new measures for fish habitat;[25] and authorizes limited access privilege programs (LAPPs).[26] On its face, FCMRA represents a step towards incorporation of ecosystem-based management into fishery conservation plans. Critics, however, point to shortcomings such as discretionary research provisions that lack sufficient substance "to overcome lingering Council resistance to conservation … [and] to implement ecosystem-based management."[27]

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[15] Sustainable Fisheries Act of 1996, Pub. L. No. 104-297, 110 Stat. 3559 (1996) (amended 2007).
[16] Madeline June Kass, *Fishery Conservation and Management Act Reauthorization: "A" for Effort, "C" for Substance*, 21-SPG NAT. RESOURCES & ENV'T 52, 52 (2007) (citing JOSEPH J. KALO, ET AL., *supra* note 11, at 436).
[17] Sustainable Fisheries Act of 1996, *supra* note 15. *See also* Eugene H. Buck & Daniel A. Waldeck, *The Magnuson-Stevens Fishery Conservation and Management Act: Reauthorization Issues*, CRS Report for Congress, 7 (2005).
[18] Robin Kundis Craig, *Coral Reefs, Fishing, and Tourism: Tensions in U.S. Ocean Law and Policy Reform*, 27 STAN. ENVTL. L.J. 3, 16 (2008).
[19] *Id.*
[20] Kass, *supra* note 16, at 52. *See also* PEW REPORT, *supra* note 4, at 35-36.
[21] Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, Pub. L. No. 109-479, 120 Stat. 3575 (2007).
[22] *Id.* at § 104.
[23] *Id.* § 204, 208, 210.
[24] *Id.* § 103.
[25] *Id.* § 105.
[26] *Id.* § 106. LAPPs allow for issuance of individual fishing quotas (IFQs) and represent a market-based approach to fishery management. *See generally*, THE PEW ENVIRONMENT GROUP, DESIGN MATTERS: MAKING CATCH SHARES WORK (2009) (discussing the use of LAPPs).
[27] Kass, *supra* note 16, at 53.

B. State Management

Within its own jurisdictional waters, each state regulates fisheries at its discretion.[28] State jurisdiction applies to fishery resources within state waters.[29] In most instances, state waters extend three nautical miles (nm) from shore.[30] In the Gulf of Mexico, however, Texas and Florida have jurisdiction extending nine nm.[31] Although state laws often mimic federal regulations, states are not required to do so.[32] States may use a variety of tools to manage fisheries, including conservation and management regimes, statutes, and judicial decisions.[33] Inconsistencies often occur as a result, potentially thwarting federal management efforts (habitat, seasons, bag limits) and leading to confusion and enforcement difficulties.

C. Regional Commissions

Prior to 1950, Congress created three regional Commissions to better utilize the coastal Atlantic, coastal Pacific, and Gulf of Mexico fisheries: 1) the ASMFC;[34] 2) the GSMFC;[35] and 3) the PSMFC.[36] The Commissions function to make "joint fishery regulation recommendations to the member states through detailed FMPs."[37] The Commissions' jurisdiction is primarily limited to state waters but Commissions also work with MSA Regional Councils for fisheries abundant in both state and federal waters.[38] With the exception of the ASMFC,[39] the Commissions play only advisory roles in state fishery management and lack authority to compel states to adopt their recommendations.[40]

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[28] Sarah Bittleman, *Toward More Cooperative Fisheries Management: Updating State and Federal Jurisdictional Issues*, 9 TUL. ENVTL. L.J. 349, 357 (1996).

[29] H.R. Rep. No. 445, 94th Cong., 2d Sess., at 29 (1976), reprinted in 1976 U.S.C.C.A.N. 593, 602. *See also* Bittleman, *supra* note 28, at 361.

[30] Closure of the 2008 Gulf of Mexico Recreational Fishery for Red Snapper, 73 Fed. Reg. 15674 (March 25, 2008) [hereinafter 2008 Red Snapper Closure Rule].

[31] *Id.* After the passage of the Submerged Lands Act, Texas successfully claimed a "historic boundary" that extended nine nautical miles. *United States v. Louisiana*, 363 U.S. 1 (1960); *See also United States v. Louisiana*, 389 U.S. 155 (1967); *United States v. Louisiana*, 394 U.S. 1 (1969). Florida was equally successful in extending its jurisdiction in the Gulf of Mexico but its Atlantic Ocean boundary extends only three miles. *United States v. Florida*, 363 U.S. 121 (1960); *United States v. Florida*, 420 U.S. 531 (1975). Mississippi, Louisiana, and Alabama unsuccessfully made similar claims. *See also* KALO, ET AL., *supra* note 11, at 422.

[32] Bittleman, *supra* note 28, at 357.

[33] Joseph A. Farside, Jr., *Atlantic States Marine Fisheries Commission: Getting a Grip on Slippery Fisheries Management*, 11 ROGER WILLIAMS U. L. REV. 231, 235 (2005).

[34] Atlantic States Marine Fisheries Commission Compact, Pub. L. No. 77-539, 56 Stat. 267 (1942), *available at* http://www.asmfc.org/publications/revisedCompactRules&Regs0304.pdf .

[35] Gulf States Marine Fisheries Commission Compact, Pub. L. No. 81-66, 63 Stat. 70 (1949), *available at* http://www.gsmfc.org/compact.html . The GSMFC is comprised of Florida, Alabama, Mississippi, Louisiana, and Texas, as is the Gulf Regional Council under the MSA.

[36] Pacific States Marine Fisheries Commission Compact, Pub. L. No. 80-232, 61 Stat. 419 (1947), *available at* http://www.psmfc.org/ .

[37] Farside, *supra* note 33, at 237.

[38] *Id.* at 238.

[39] *See* 16 U.S.C. § 5101, *et seq.*

[40] Corey Hall, *The Menhaden Reduction Fishery: Capping the Catch*, 16 PENN ST. ENVTL. L. REV. 279, 290 (2007).

D. Regulatory Framework

1. Regional Councils

The MSA delegated fishery management to eight regional councils comprised of state and federal officials as well as regional fisheries stakeholders.[41] The regional councils are charged with the development of fishery management plans (FMPs) and implementation of regulations necessary to manage the fisheries.[42] By including these stakeholders, "[t]he original hope … was that people who spend time on, near, and working in ocean-related careers would be well positioned to inform the agency about real, current problems with fish and fishing and suggest potential management solutions."[43]

Under the MSA, councils have vast authority to regulate fishery management within their respective regions, including "primary responsibility for developing and amending FMPs."[44] The councils also propose regulations necessary for the implementation of FMPs which are then enacted through NMFS with limited oversight.[45] Specifically, NMFS lacks authority to "revise a council-submitted FMP, amendment, or propose regulation to suit its own policy preferences, or to write regulations that undercut council policy intent, except when they conflict with other applicable laws."[46] NFMS may, however, approve, partially approve, or disapprove FMPs submitted by the Councils.[47] As will be seen in the Gulf red snapper case study, this limited oversight can result in conservation plans developed by fishery stakeholders that are counterintuitive to the plain language of the statute.

2. Fishery Management Plans

The MSA establishes both required and discretionary FMP components.[48] Pursuant to the mandatory provisions, FMPs must include: (1) provisions "necessary and appropriate for the conservation and management of the fishery, to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery;"[49] (2) a description of the fishery;[50] (3) specification of "the maximum sustainable yield and optimum yield" from the fishery;[51] (4) description and identification of essential fish habitat and measures to minimize adverse effects to the extent practicable;[52]

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[41] 16 U.S.C. § 1852(a) (regional councils); §§ 1854(a)-(c) (federal supervision).
[42] *Id.* §§ 1852(h) and 1853.
[43] Marianne Cufone, *Will There Always Be Fish in the Sea? The U.S. Fishery Management Process*, 19 SUM NAT. RESOURCES & ENV'T 28, 29 (2004).
[44] Scott C. Matulich, et al., *Policy Formulation Versus Policy Implementation Under the Magnuson-Stevens Fishery Conservation and Management Act: Insight from the North Pacific Crab Rationalization*, 34 B.C. ENVTL. AFF. L. REV. 239, 240 (2007).
[45] *Id.* at 240-41.
[46] *Id.* (citing 16 U.S.C. § 1854).
[47] 16 U.S.C. § 1854(a).
[48] *Id.* §§ 1853(a) (1)-(14) (required); §§ 1853(b)(1)-(12) (discretionary).
[49] *Id.* § 1853(a)(1)(A).
[50] *Id.* § 1853(a)(2).
[51] *Id.* § 1853(a)(3).
[52] *Id.* § 1853(a)(7).

(5) measurable criteria for identifying overfished fishery and measures to prevent or end overfishing and rebuild the stock;[53] and (6) a fishery impact statement.[54]

In addition, ten national standards guide FMP promulgation.[55] National Standard 1 requires management measures that "prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery for the United States fishing industry."[56] The MSA defines optimum yield as "maximum sustainable yield from the fishery."[57] Maximum sustainable yield is defined by regulation as "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions."[58] Other national standards include: use of best available science,[59] valuation of fishing communities,[60] reduction of adverse impacts on such communities,[61] and bycatch minimization. [62]

3. Overfished Stocks

Under the MSA, each Council must annually report to Congress on the status of fisheries within its jurisdiction, identifying stocks that are overfished or approaching overfished status.[63] When a fishery is declared overfished, the Council must, within one year, produce a plan that will "end overfishing in the fishery and rebuild affected stocks of fish."[64] The plan must "provide for rebuilding to a level consistent with" maximum sustainable yield.[65] The timeframe must be "as short as possible, taking into account the status and biology of any overfished stock of fish, the needs of fishing communities, … and the interaction of the overfished stock of fish within the marine ecosystem."[66] In balancing these factors, courts have interpreted this provision as requiring NMFS to give priority to conservation measures.[67] Where biologically possible, overfished stocks must be rebuilt within ten

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[53] *Id.* § 1853(a)(10).
[54] *Id.* § 1853(a)(9).
[55] *Id.* §§ 1851(a)(1)-(10).
[56] *Id.* § 1851(a)(1).
[57] *Id.* § 1802(28)(b).
[58] 50 C.F.R. § 600.310(1).
[59] 16 U.S.C. § 1851(a)(2). National Standard 2: "Conservation and management measures shall be based upon the best scientific information available."
[60] *Id.* § 1851(a)(8). National Standard 8: "Conservation and management measures shall, consistent with the conservation requirements of this chapter (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities … in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities."
[61] *Id.*
[62] *Id.* § 1851(a)(9). National Standard 9: "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."
[63] *Id.* § 1854(e)(1).
[64] *Id.* § 1854(e)(3). If the council plan is inadequate, NMFS has an additional nine months to promulgate a legally sufficient plan. *Id.* § 1854(e)(5).
[65] *Id.* § 1802(28)(c).
[66] *Id.* § 1854(e)(4)(A)(i).
[67] National Resources Defense Council v. National Marine Fisheries Service, 421 F.3d 872, 879 (9th Cir. 2005).

years.[68] If not possible, the species must be rebuilt within a time period in which the species would naturally rebuild in the absence of any fishing mortality (referring to the cessation of the directed fishery), "plus a period of one mean generation time … based on the species' life history characteristics."[69] This time period varies by species.

4. Bycatch

As established in National Standard 9, FMPs must address bycatch to the extent practicable. "Bycatch" is statutorily defined 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."[70] To comply with this provision, FMPs must establish "standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery."[71] FMPs are further required, to the extent practicable, to include conservation and management measures that "in the following priority (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided."[72]

E. Fishing Regulations: Problems and Solutions

In the last decade, concerns over potential fishery collapse prompted several reviews of domestic fishery management. Both the Pew Ocean Commission and the Bush-era U.S. Commission on Ocean Policy conducted in-depth studies of current management tactics. The Commission led to the U.S. Ocean Action Plan. Most recently, President Obama established an Interagency Ocean Policy Task Force which has released interim findings.

1. Pew Oceans Commission

In 2003, the Pew Oceans Commission (Pew Commission) assessed the current status of U.S. fishery management practices in its report entitled *America's Living Oceans: Charting a Course for Sea Change*.[73] The Pew Commission was comprised of "a bipartisan, independent group of American leaders" representing "science, fishing, conservation, government, education, business, and philanthropy."[74] The Pew Commission determined that the "hodgepodge of individual laws" regulating marine resources resulted in a geographically fragmented regulatory system.[75] Federal/state jurisdictional divisions of management further compounded the problem.[76] The Pew Commission recognized overfishing as a primary culprit of marine ecosystem decline, recognizing that "overfishing has been

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[68] 16 U.S.C. § 1854(e)(4)(A)(ii).
[69] 50 C.F.R. § 600.310(e)(4)(ii)(B)(3). "For example, suppose a stock could be rebuilt within 12 years in the absence of any fishing mortality, and has a mean generation time of 8 years. The rebuilding period, in this case, could be as long as 20 years." *Id.*
[70] 16 U.S.C. § 1802(2).
[71] *Id.* § 1853(a)(11).
[72] *Id.*
[73] PEW REPORT, *supra* note 4.
[74] *Id.* at ix.
[75] *Id.* at 26. *See also* Donna R. Christie, *Implementing an Ecosystem Approach to Ocean Management: An Assessment of Current Regional Governance,* 16 DUKE ENVTL. L. & POL'Y F. 117, 120 (2006).
[76] PEW REPORT, *supra* note 4, at 26.

depleting marine biodiversity for decades."[77]

According to the Pew Commission, implementation of ecosystem-based management requires adopting a new perspective that includes understanding these five elements: "(1) there are limits to our knowledge; (2) marine ecosystems are inherently unpredictable; (3) ecosystems have functional, historical, and evolutionary limits that constrain human exploitation; (4) there is a fundamental trade-off in fishing that must be balanced between fish for human consumption and fish for the rest of the ecosystem; and (5) ecosystems are complex, adaptive systems."[78] Particularly, the concept of "overfishing" must be rethought to include consideration of the ecosystem effects rather than just the target species level.[79]

2. U.S. Commission on Ocean Policy

The Oceans Act of 2000 created the U.S. Commission on Ocean Policy (U.S. Commission) to "establish findings and develop recommendations for a coordinated and comprehensive national ocean policy."[80] In 2004, the U.S. Commission released its findings in *An Ocean Blueprint for the 21st Century*.[81] Therein, the U.S. Commission determined that existing marine regulation was generally inadequate to effectuate long-term positive objectives.[82] Specific problems identified as inhibiting effective action included lack of communication and coordination, and a lack of strong sense of partnership.[83]

The U.S. Commission recommended incorporation of ecosystem-based management with focus on three themes: "(1) a new, coordinated national ocean policy framework to improve decision making; (2) cutting edge ocean data and science translated into high-quality information for managers; and (3) lifelong ocean-related education to create well-informed citizens with a strong stewardship ethic."[84] The U.S. Commission identified guiding principles including the use of best available science and information, use of adaptive management, and preservation of marine biodiversity.[85] Other recommendations include strengthening the federal agency structure, greater investment in science, and the creation of a national ocean education office to spearhead improved educational awareness.[86]

The U.S. Commission proposed enhanced regional management through "voluntary establishment of regional ocean councils, developed through a process supported by the National Ocean Council, [that] would facilitate the development of regional goals and priorities and improve responses to regional issues."[87] Specific to fisheries management, the

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[77] Craig, *supra* note 18, at 28 (citing PEW REPORT, *supra* note 4, at 2).
[78] PEW REPORT, *supra* note 4, at 44.
[79] *Id.*
[80] USCOP REPORT, *supra* note 2, at 3; Oceans Act 2000, Pub. L. No. 106-256, § 3(a), 114 Stat. 644, 645 (2000).
[81] USCOP REPORT, *supra* note 2, at 3.
[82] *Id.* at 5.
[83] *Id.* at 77.
[84] *Id.* at 5.
[85] *Id.* at 6.
[86] *Id.* at 10-14.
[87] *Id.* at 86. *See also* Kristen M. Fletcher, *Regional Ocean Governance: The Role of the Public Trust Doctrine*, 16 DUKE ENVTL. L. & POL'Y F. 187, 191 (2006).

U.S. Commission made six recommendations for achieving sustainable fisheries including greater emphasis on science in decision-making, strengthening regional fishery councils and diversifying membership, and adopting an ecosystem-based management approach to address essential fish habitat and bycatch.[88]

3. U.S. Ocean Action Plan

To address the need for the "development and dissemination of regionally significant research and information" necessary to support ecosystem-based management, the U.S. Ocean Action Plan (USOAP) supported "creation of regional collaborations on oceans, coasts, and Great Lakes policy in partnership with states, local governments, and tribes."[89] The USOAP placed particular emphasis on regional partnerships in the Great Lakes and Gulf of Mexico.[90] Following the 2004 USOAP, the Administration committed support for a Gulf of Mexico regional partnership to provide "increased integration of resources, knowledge and expertise to enhance ecological and economic health of the Gulf of Mexico."[91] The resulting partnership led to the creation of the Gulf of Mexico Alliance "whose objective was to provide an integrated management approach for the Gulf of Mexico led by surrounding states."[92]

4. Interagency Ocean Policy Task Force

In June 2009, President Obama created an Interagency Ocean Policy Task Force charged with, among other things, developing recommendations for a national policy to ensure "protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources."[93] The Task Force released its *Interim Report* in September 2009 in which it identified nine priority objectives for a national policy; ecosystem-based management topped this list.[94] Other priorities included greater coordination and support among regulators; regional ecosystem protection and restoration; and resiliency and adaptation to climate change and ocean acidification.[95]

III. Ecosystem-Based Approach to Fishery Management

A. Key Tenets of Ecosystem-Based Management

[88] USCOP REPORT, *supra* note 2, at 20.
[89] Fletcher, *supra* note 87, at 191 (citing COUNCIL ON ENVTL. QUALITY, U.S. OCEAN ACTION PLAN: THE BUSH ADMINISTRATION'S RESPONSE TO THE U.S. COMMISSION ON OCEAN POLICY 10-11 (2004), *available at* http://ocean.ceq.gov/actionplan.pdf [hereinafter USOAP]).
[90] USOAP, *supra* note 89.
[91] *Id.* at 5, 11. *See also* Katherine W. McFadden & Cassandra Barnes, *The Implementation of an Ecosystem Approach to Management Within a Federal Government Agency*, 33 MARINE POLICY 156 (2009).
[92] *Id.* at 159.
[93] IOPTF INTERIM REPORT, *supra* note 7, at 2.
[94] *Id.* at 7.
[95] *Id.*

Essentially EBM refers to a "more holistic approach" to governance beyond the single-species approach often found in current management regimes.[96] That is, fishery practices that affect an entire ecosystem should go beyond mere governance of the target species and take into account "the wide-range of horizontal and vertical ecological relationships that exist between and among organisms."[97] The overarching goal of an ecosystem-based approach is to "maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need."[98]

Partially in response to the USOAP, NOAA has made strides towards incorporating EBM into its management practices.[99] NOAA defines an ecosystem approach to management[100] as:

> An ecosystem approach to management (EAM) is one that provides a comprehensive framework for living resource decision making. In contrast to individual species or single issue management, EAM considers a wider range of relevant ecological, environmental, and human factors bearing societal choices regarding resource use.[101]

NOAA identifies the following as defining characteristics of EAM:

> (1) geographically specified, (2) adaptive in its development over time as new information becomes available or as circumstances change, (3) takes into account ecosystem knowledge and uncertainties, (4) recognizes that multiple simultaneous factors may influence the outcomes of management (particularly those external to the ecosystem), and (5) strives to balance diverse societal objectives that result from resource decision making and allocation. Additionally, because of its complexity and emphasis on stakeholder involvement, the process of implementing EAM needs to be (6) incremental and (7) collaborative.[102]

Other organizations have adopted similar approaches to ecosystem-based fishery management. Particularly, the United Nations Food & Agriculture Organization describes an approach that incorporates social objectives, recognizes the value of ecosystem services, and integrates multiple uses:[103]

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[96] Howard S. Schiffman, *Moving From Single-Species Management to Ecosystem Management in Regional Fisheries Management Organizations*, 13 ILSA J. INT'L & COMP. L. 387, 387-88 (2007).
[97] *Id.* at 388.
[98] K.L. MCLEOD, ET AL., SCIENTIFIC CONSENSUS STATEMENT ON MARINE ECOSYSTEM-BASED MANAGEMENT 1 (2005) (signed by 219 academic and policy experts).
[99] McFadden & Barnes, *supra* note 91, at 2.
[100] EAM is the acronym used by NOAA. For purposes of this paper, EAM and EBM are interchangeable.
[101] NOAA, ECOSYSTEM SCIENCE CAPABILITIES REQUIRED TO SUPPORT NOAA'S MISSION IN THE YEAR 2020, TECHNICAL MEMORANDUM NMFS-F/SPO-74, 2 (S.A. Murawski & G.C. Matlock eds., 2006) [hereinafter NOAA TECHNICAL MEMORANDUM].
[102] *Id.*
[103] Steven A. Murawski, *Ten Myths Concerning Ecosystem Approaches to Marine Resource Management*, 31 MARINE POLICY 681, 682 (2007).

> An ecosystem approach to fisheries strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.[104]

Similarly, the President's Interagency Ocean Policy Task Force described EBM as the integration of "ecological, social, economic, commerce, health, and security goals" and recognition that "humans [are] key components of the ecosystem and healthy ecosystems [are] essential to human well-being."[105]

While a precise definition of EBM remains elusive, all definitions exhibit certain universally agreed upon essential elements: regional governance, adaptive management, moving beyond single species management, and increasing the role of science. A detailed description of these key tenets follows.

1. Regional Governance

Creation of a regional management framework represents a fundamental and widely accepted aspect of EBM.[106] Currently, federal fisheries are managed within a regional system while states individually manage fishery resources within their jurisdictional waters. This delineation of management denotes a significant impediment to ecosystem-based fishery management in the United States.[107] As will be seen below in the management challenges of the red snapper and shrimp fisheries, arbitrary jurisdictional boundaries that cut across fishery habitats hinder cohesive management by allowing states to adopt practices which conflict, and at times undercut, federal efforts. EBM necessitates integrated interagency fishery management.

2. Move Beyond Single Species

Management of fisheries on an ecosystem level necessitates moving beyond traditional single species management. EBM requires assessment of the "interconnectedness within systems" including the interactions of harvested and non-harvest species.[108] Moving beyond single species management measures allows regulators to address the broader spectrum of ecosystem issues, like bycatch and habitat protection, when creating FMPs and corresponding regulations.[109] Fishery bycatch results in significant impact to marine ecosystems.[110] By considering "the role of habitat in resource and system productivity and the effect of environmental forcing on system dynamics," regulators are provided "a more

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[104] FISHERIES DEP'T, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, THE ECOSYSTEM APPROACH TO FISHERIES (2003), *available at* http://www.fao.org/fishery/topic/13261 .
[105] IOPTF INTERIM REPORT, *supra* note 7, at 12.
[106] Christie, *supra* note 75, at 118.
[107] *Id.*
[108] Deborah A. Sivas & Margaret R. Caldwell, *A New Vision for California Ocean Governance: Comprehensive Ecosystem-Based Marine Zoning*, 27 STAN. ENVTL. L.J. 209, 245 (2008). *See also* NOAA TECHNICAL MEMORANDUM, *supra* note 101, at 21.
[109] Schiffman, *supra* note 96, at 389.
[110] Jennie M Harrington, et al., *Wasted Fishery Resources: Discarded By-Catch in the USA*, 6 FISH AND FISHERIES 350, 350 (2005).

inclusive and necessary ecosystem perspective."[111] In addition, a focus on single-species regulation often places too great an emphasis on economically valuable species and increased catches. In time, the singular focus on economically important species may undermine "any regulatory attempt to preserve the resource or the supporting ecosystem because there is insufficient economic, and hence political, opposition to the continuation of that use."[112]

3. Adaptive Management

Adaptive management has been referred to as "learning while doing."[113] Adaptive management techniques allow managers to learn from past mistakes and respond with innovative alternatives.[114] Moving away from the conventional regulatory approach, adaptive management "emphasizes the need for learning and reevaluation" combining "precaution with science."[115] Implementing adaptive management provides greater flexibility and speed with which managers may respond to emerging problems. This increased response time may prove invaluable in coping with the effects of climate change on natural resources.

Adaptive management is not synonymous with EBM. It is, however, a necessary component of EBM because an adaptive management framework provides regulators with the necessary leeway to respond to ever changing states within the ecosystems they manage.[116] For instance, NOAA, in defining EBM, specifically identified the need for ecosystem management to be adaptive in nature.[117] Incorporating this approach into EBM allows development of management practices that evolve along with the ecosystems they seek to regulate.

4. Increased Role of Science

Increased development and reliance upon science represents an essential component of EBM: "[E]cosystem perspectives require information about the interrelationships among ecosystem components as a basis for informing policy choices."[118] Scientists must provide fishery managers with accurate scientific information to achieve successful implementation of adaptive management and to transition beyond single species management.[119] Increased

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[111] NOAA TECHNICAL MEMORANDUM, *supra* note 101, 21.
[112] Robin Kundis Craig, *Valuing Coastal and Ocean Ecosystem Services: The Paradox of Scarcity for Marine Resources Commodities and the Potential Role of Lifestyle Value Competition*, 22 J. LAND USE & ENVTL. L. 355, 394 (2007).
[113] Holly Doremus, *Precaution, Science, and Learning While Doing in Natural Resource Management*, 82 WASH. L. REV. 547, 568 (2007).
[114] Annecoos Wiersema, *A Train Without Tracks: Rethinking the Place of Law and Goals in Environmental and Natural Resources Law*, 38 ENVTL. L. 1239, 1250 (2008).
[115] Doremus, *supra* note 113, at 568.
[116] *See* IOPTF INTERIM REPORT, supra note 7, at 12.
[117] NOAA TECHNICAL MEMORANDUM, *supra* note 101, at 2.
[118] Murawski, *supra* note 103, at 683.
[119] Margreta Vellucci, *Fishing for the Truth: Achieving the "Best Available Science" By Forcing a Middle Ground Between Mainstream Scientists and Fishermen*, 30-SPG ENVIRONS ENVTL. L. & POL'Y J. 275, 282 (2007).

scientific study is necessary for the better understanding of "complex biological relationships that exist in the marine environment."[120]

B. Legal Authority for Ecosystem-Based Fishery Management

Existing U.S. fishery legislation provides ample authority for the incorporation of EBM into management decisions. National Standard 2 mandates use of "best available science" in promulgating FMPs.[121] Other national standards provide additional support for an ecosystem-based approach to fishery management by mandating an end to overfishing and the minimization of bycatch.[122] The recently reauthorized MSA contains expanded authorities for considering ecosystem impacts.[123] This includes creation of scientific and statistical committees, ecosystem study, and deadlines for ending overfishing.[124]

Through the use of regional councils, legal authority for regional management exists under the MSA within federal waters. However, true regional management efforts are stymied by the heavy influence of fishery stakeholders and the federal/state jurisdictional boundary. First, scientists and environmentalists rarely are represented on regional councils.[125] While the MSA requires representation of commercial and recreational fisheries, others like conservation interests and recreational users are not afforded the same representation.[126] As a result, government officials and fishery stakeholders generally comprise council membership.[127] This has led commentators to criticize the councils for being "slow to adopt significantly restrictive catch limits" and being "overly dependent on fishing interests."[128] The reauthorized MSA includes greater conflict of interest disclosure requirements but has not affected council composition.[129] As acknowledged by the U.S. Commission, regional councils are transitioning towards an ecosystem-based approach but regional councils must extend considerations beyond fisheries, incorporating other resources and activities into fishery conservation measures.[130]

Second, states' three-nm jurisdiction "presents an additional challenge to transitioning to much-needed comprehensive marine ecosystem management."[131] Although the MSA

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[120] Schiffman, *supra* note 96, at 389.
[121] 16 U.S.C. § 1851(a)(2).
[122] *Id.* § 1851(a)(1) (overfishing); § 1851(a)(9) (bycatch reduction). *See also* ECOSYSTEM PRINCIPLES ADVISORY PANEL, ECOSYSTEM-BASED FISHERY MANAGEMENT: A REPORT TO CONGRESS, 11 (1999), *available at* http://www.nmfs.noaa.gov/sfa/EPAPrpt.pdf .
[123] Murawski, *supra* note 103, at 684.
[124] *See* 16 U.S.C. § 1801, *et seq.*
[125] André Verani, *Community-Based Management of Atlantic Cod By the Georges Bank Hook Sector: Is It a Model Fishery?*, 20 TUL. ENVTL. L.J. 359, 366 (2007).
[126] JOSH EAGLE, ET AL., TAKING STOCK OF THE REGIONAL FISHERY MANAGEMENT COUNCILS, 13 (2003).
[127] Verani, *supra* note 125, at 366.
[128] Rachael E. Salcido, *Offshore Federalism and Ocean Industrialization*, 82 TUL. L. REV. 1355, 1430 (2008). *See also* Teresa M. Cloutier, *Conflicts of Interest on Regional Fishery Management Councils: Corruption or Cooperative Management?*, 2 OCEAN & COASTAL L.J. 101, 101-03 (1996) (explaining the background to council development and potential changes to address continued overfishing).
[129] Peter Van Tuyn & Valerie Brown, *A Look Within: Executive Branch Authority to Ensure Sustainable Fisheries,* 14 OCEAN & COASTAL L.J. 1 (2008).
[130] Christie, *supra* note 75, at 127.
[131] Salcido, *supra* note 128, at 1370.

provides federal preemption authority in certain instances, states continue to exercise primary control over fisheries within the territorial sea. [132] Federal regulators may assume control over "fisheries management in state waters if state action 'will substantially and adversely affect' a federal fishery management plan for a fishery that occurs in both state and federal waters."[133] Through these provisions, regional councils could expand control of migratory fisheries that are jeopardized by state action eventually leading to greater management cohesion.

Ultimately, existing regulations afford sufficient support for achieving EBM in domestic fisheries. However, councils comprised of fishery stakeholders lack motivation to implement discretionary measures which impedes progress.[134] As a result, critics argue that discretionary aspects, such as ecosystem studies, lack sufficient substance "to overcome lingering Council resistance to conservation, to assure that the most-needed data gets collected in the timeliest fashion, or to implement ecosystem-based management."[135] While the MSA mandates immediate action to end overfishing, in actuality councils can postpone taking action well into 2011, some two and half years after passage of the reauthorization.[136] The MSA requires technical expertise for catch limit determinations, but leaves conservation measure decisions to the more politically motivated councils.[137] While providing authority for incorporation of EBM, the MSA falls short of mandating the incorporation of these principles into FMPs.

IV. Dynamics of the Gulf of Mexico Red Snapper and Shrimp Fisheries

Although the MSA employs a regional approach to fishery management, the challenges of the red snapper and shrimp fisheries in the Gulf of Mexico highlight the shortcomings of the MSA in achieving EBM. As explained by Chris Dorsett, formerly with the Gulf Restoration Network, "[t]wo of the most valuable fisheries in the Gulf are always at each other's throats because shrimp trawls catch too many juvenile red snapper as bycatch. We could stop all directed catches of red snapper tomorrow and they still wouldn't bounce back in the near future unless juvenile mortality from shrimp trawling is reduced significantly."[138] The Gulf Council oversees both fisheries but has historically failed to address the devastating effects of the shrimp trawl bycatch on the overfished red snapper; a problem further compounded by overlapping habitat and inadequacies of effective bycatch reduction devices.

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[132] Bittleman, *supra* note 28, at 361-62.
[133] Craig, *supra* note 18, at 40 (citing 16 U.S.C. § 1856(b)).
[134] Roger Fleming & Dr. John D. Crawford, *Habitat Protection Under the Magnuson-Stevens Act: Can It Really Contribute to Ecosystem Health in the Northwest Atlantic?*, 12 OCEAN & COASTAL L.J. 43, 85 (2006).
[135] Kass, *supra* note 16, at 53.
[136] *Id.* at 52.
[137] *Id.* at 54. *See also* Jennifer C. White, *Conserving the United States' Coral Reefs: National Monument Designation to Afford Greater Protection for Coral Reefs in Four National Marine Sanctuaries*, 32 WM. & MARY ENVTL. L. & POL'Y REV. 901, 910 (2008) (noting the effectiveness of council management to meaningfully limit commercial fishing).
[138] PEW REPORT, *supra* note 4, at 44.

A. Overview of the Fisheries

To better understand the complexities facing fishery managers, a brief overview of each fishery and the regional variances is provided below. As explained in more detail below, both red snapper and shrimp migrate during their lifetimes. This dynamic results in juvenile red snapper sharing the same water column as sub-adult brown shrimp during shrimping season, particularly in the western Gulf of Mexico. Although the Gulf of Mexico shrimp fishery manages four different shrimp varieties, particular attention is paid to brown shrimp due to its overlapping habitat with juvenile red snapper.

1. The Shrimp Fishery

Catch statistics for the commercial shrimp fishery were first reported in 1880. White shrimp dominated the market until 1947 when major concentrations of brown shrimp were discovered off Texas and became marketable.[139] Brown shrimp have consistently gained market share since that time and are now the predominant shrimp species in domestic landings. In recent years, commercial landings of brown shrimp ranged from 61 to 103 million pounds.[140] In 2008, brown shrimp landings in U.S. waters totaled 86 million pounds, primarily off the Texas, Louisiana, and Alabama coasts.[141]

Brown, white, and pink shrimp are all shallow-water shrimp, and in the Gulf of Mexico, they are primarily found inside sixty fathoms along the continental shelf.[142] A 1977 survey revealed that the highest concentrations of brown shrimp were found off coastal Texas and extended eastward into Alabama.[143] White shrimp were found in shallower waters of the same area with highest concentrations west of the Mississippi River delta.[144] Both white and brown shrimp migrate from inland estuaries into deeper waters during juvenile to sub-adult stages.[145]

Harvesting white shrimp, commonly found inside the ten-fathom contour, has limited impact on juvenile red snapper because of the small quantity of red snapper found at that depth.[146] Brown shrimp habitat, however, frequently overlaps with juvenile red snapper habitat and shrimpers fishing for brown shrimp in the western Gulf of Mexico frequently

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[139] DAVID J. ETZOLD & J. Y. CHRISTMAS, A COMPREHENSIVE SUMMARY OF THE SHRIMP FISHERY OF THE GULF OF MEXICO UNITED STATES: A REGIONAL MANAGEMENT PLAN, 18 (Gulf Coast Research Laboratory, 1977).

[140] GULF OF MEXICO FISHERY MANAGEMENT COUNCIL, OPTIONS PAPER: AMENDMENT 15 TO THE SHRIMP FISHERY MANAGEMENT PLAN, 18 (2006) (Under development) (on file with author).

[141] NMFS, Fishwatch - U.S. Seafood Facts: Brown Shrimp, http://www.nmfs.noaa.gov/fishwatch/species/brown_shrimp.htm (last visited Dec. 4, 2009).

[142] ETZOLD & CHRISTMAS, *supra* note 139, at 14.

[143] *Id.*

[144] *Id.*

[145] GULF OF MEXICO FISHERY MANAGEMENT COUNCIL, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE GENERIC ESSENTIAL FISH HABITAT AMENDMENT OF THE GULF OF MEXICO, 3-126 to 3-127 (2004) [hereinafter EFH EIS].

[146] GULF OF MEXICO FISHERY MANAGEMENT COUNCIL, FINAL AMENDMENT 27 TO THE REEF FISH MANAGEMENT PLAN AND AMENDMENT 14 TO THE SHRIMP FISHERY MANAGEMENT PLAN SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT, 37 (2007) [hereinafter AMENDMENT 27/14 FSEIS].

net juvenile red snapper. Brown shrimp range extends offshore approximately 40 fathoms with most catches made from June through October.[147]

The Gulf Council first began regulation of the Gulf of Mexico shrimp fishery in 1981 and included brown, white, pink, and royal red shrimp.[148] Unlike the red snapper, Gulf shrimp stocks are not subject to overfishing.[149] Instead, regulations are designed to optimize yield and protect habitat.[150] Since 2005, the offshore shrimping effort has undergone a substantial decline.[151] Externalities such as heightened fuel costs, reduced shrimp prices, foreign import competition, and hurricanes have resulted in a fifty to sixty percent reduction from the baseline shrimping level (2001-2003 period) in prime red snapper habitat.[152] Researchers expect these reductions to continue until at least 2012.[153] While detrimental to the shrimp fishermen, these unanticipated economic impacts may aid red snapper recovery.

2. Red Snapper Fishery

The Gulf of Mexico red snapper fishery originated off the coast of Pensacola, Florida more than 150 years ago and had evolved into a distinct industry by 1872.[154] Dwindling stocks and the availability of ice prompted fisherman to expand their range.[155] By 1892, the fishery extended to the western Gulf of Mexico and the Campeche Banks in Mexico.[156] However, historical studies suggest that western Florida and the Campeche Banks were the primary fishing grounds until the 1950s.[157] Around that time, harvests from the western Gulf of Mexico began equaling the eastern Gulf harvests.[158] By 2005, when NMFS compiled the SEDAR Stock Assessment, catches from the western Gulf surpassed eastern landings by six to seven times.[159]

Red snapper are a long lived species, with the maximum age reported for the Gulf of Mexico being 57 years.[160] Although mature red snapper are generally associated with reef

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147 *Id.* at 56.
148 *Id.* at 11.
149 EFH EIS, *supra* note 145, at 3-124.
150 AMENDMENT 27/14 FSEIS, *supra* note 146, at 11.
151 *Id.* at 37.
152 *Id.* at 37, 57.
153 *Id.* at 37.
154 B.J. Gallaway, et al., *Estimates of Shrimp Trawl Bycatch of Red Snapper (Lutjanus campechanus) in the Gulf of Mexico, in* FISHERY STOCK ASSESSMENT MODELS, ALASKA SEA GRANT COLLEGE PROGRAM, 818 (1998).
155 Robert L. Shipp & Stephen A. Bortone, *A Prospective of the Importance of Artificial Habitat on the Management of Red Snapper in the Gulf of Mexico*, REVIEWS IN FISHERIES SCIENCE, 17[1]:41-47, 42 (2009).
156 Gallaway, et al., *supra* note 154, 818.
157 Shipp & Bortone, *supra* note 155, 42-43 (citing C.I. Camber, *A Survey of the Red Snapper Fishery of the Gulf of Mexico, with Special Reference to the Campeche Banks*, STATE OF FLORIDA BOARD OF CONSERVATION MARINE LABORATORY, TECHNICAL SERIES NO. 12 (1955)).
158 Shipp & Bortone, *supra* note 155, 43.
159 *Id.* at 43. But recent surveys indicate red snapper are moving east after displacement from hurricanes and other factors. *Id.*
160 NMFS, FishWatch – U.S. Seafood Facts: Red Snapper, http://www.nmfs.noaa.gov/fishwatch/species/red_snapper.htm (last visited Dec. 4, 2009).

structures, juvenile red snapper inhabit the water column, predominately ten to thirty fathoms below the surface.[161] Female red snapper reach reproductive maturity as early as two years of age, but do not "reach peak reproductive productivity until approximately 15 to 20 years of age."[162] Most red snapper harvested in the Gulf of Mexico average between two to four years of age.[163]

Between 1965 and 1980, red snapper landings experienced "an almost uninterrupted decline."[164] Following the first red snapper assessment in 1988, scientists concluded the red snapper was significantly overfished and called for mortality reductions of sixty to seventy percent.[165] In a 1990 study, researchers determined that the red snapper commercial harvest fell from 7.2 million pounds in 1983 to 2.9 million pounds in 1989.[166] Studies indicate that Gulf red snapper populations are approximately three percent of historic levels.[167]

Three distinct sources contribute to red snapper mortality: recreational fishing, commercial fishing, and bycatch.[168] Charter boats and private recreational boats comprise the recreational fishery and are allocated forty-nine percent of the total allowable catch while fifty-one percent goes to commercial fishers.[169] Taken together, the recreational and commercial fisheries comprise the directed red snapper fishery (those caught intentionally). Until 2007, the directed fishery accounted for 9.12 million pounds of Gulf red snapper annually.[170]

3. Bycatch and Regional Variance

Bycatch from the shrimp fishery bears primary responsibility for the current depletion of the Gulf red snapper fishery.[171] As explained above, most bycatch occurs in the brown shrimp fishery which is concentrated in the western Gulf of Mexico. As noted by Galloway and Cole, the abundance of juvenile red snapper off the coast of Texas dramatically increased during the fall because of "young of the year recruitment," thereby greatly increasing bycatch rates.[172] Shrimp trawl bycatch accounts for approximately ninety

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[161] AMENDMENT 27/14 FSEIS, *supra* note 146, at 37.
[162] Petition for Emergency Rulemaking for Red Snapper, 70 Fed. Reg. 53,142, 53,145 (Sept. 7, 2005) (to be codified at 50 C.F.R. pt. 622) [hereinafter *Red Snapper Emergency Rulemaking Petition*].
[163] AMENDMENT 27/14, *supra* note 146, at 67 (citing C.A. Wilson & D.L. Nieland, *Age and Growth of Red Snapper,* Lutjanus Campechanus, *from the Northern Gulf of Mexico off Lousiana*, 99 FISHERY BULLETIN 653, 653-64 (2001)).
[164] *Id.* at 52 (estimating reductions from 14 million pounds per year to 5 million pounds per year).
[165] SEDAR 7, *supra* note 8, at 2.
[166] *See* C.P. Goodyear & P. Phares, *Status of Red Snapper Stocks of the Gulf of Mexico – Report for 1990*, NMFS (1990).
[167] *See* SEDAR 7, *supra* note 8, at 2.
[168] AMENDMENT 27/14 FSEIS, *supra* note 146, at 1.
[169] *Id.* at 2.
[170] *Id.* at 51.
[171] Red Snapper Emergency Rulemaking Petition, *supra* note 162.
[172] Benny J. Galloway & John G. Cole, *Reduction of Juvenile Red Snapper Bycatch in the U.S. Gulf of Mexico Shrimp Trawl Fishery*, 19 NORTH AMERICAN JOURNAL OF FISHERY MANAGEMENT, 342, 344 (1999).

percent of juvenile red snapper mortality.[173] Juvenile red snapper are uniquely affected by shrimping activities because they share the same habitat as sub-adult brown shrimp until they reach maturity. Shrimp inhabit the same area resulting in significant bycatch in shrimp trawl nets during the shrimping season.[174] Most red snapper bycatch from shrimp trawls range in age from zero to one.[175] Juvenile red snapper are particularly difficult to eliminate from shrimp nets because they are comparable in size to shrimp.[176]

B. Past Management Efforts

1. Regulation prior to Amendment 22

The Reef Fish Fishery Management Plan, implemented in 1984, was intended to address the declining fish stocks including the Gulf red snapper.[177] After assessments in 1988 and 1990, scientists recommended closure of the entire directed fishery and reduction in bycatch in shrimp trawl nets.[178] In response, NMFS, in 1991, lowered the annual directed catch by one million pounds, disregarding altogether regulation of shrimp bycatch.[179] When this measure resulted in early closure of the commercial fishery in 1992, "the Gulf of Mexico Fishery Management Council implemented an emergency rule which reopened the red snapper fishery for additional catch above the optimum yield when the quota had been fulfilled in only fifty-three days."[180] The following year NMFS raised the total allowable catch (TAC) by two million pounds, totaling six million.[181] The TAC was raised yet again in 1996 from 6.0 million to 9.12 million pounds, in disregard of scientific knowledge "that red snapper were still depleted and likely declining."[182] Catch limits remained at this level until temporary measures, in response to litigation, reduced limits in 2007.[183]

While consistently raising the TAC, the Gulf Council, through amendments, continuously extended the target rebuilding date for red snapper stock. In 1990, the target rebuilding date was set at 2000. In 1991, it was extended to 2007. The date was again extended in 1993 to 2009. This target was moved to 2019 in 1996. In 2005, the date was extended to

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[173] M.J. SCHIRRIPA & C.M. LEGAULT, STATUS OF THE RED SNAPPER FISHERY IN THE GULF OF MEXICO: UPDATED THROUGH 1998, 86 (1999).
[174] Galloway & Cole, *supra* note 172, at 342.
[175] Joint Amendment to the Fishery Management Plans for the Shrimp (Amendment 14) and the Reef Fish Fisheries (Amendment 27) of the Gulf of Mexico, 73 Fed. Reg. 24,669 (May 5, 2008) [hereinafter *Joint Amendment*].
[176] AMENDMENT 27/14 FSEIS, *supra* note 145, at 67.
[177] *Id.* at 4.
[178] Marianne Cufone, *Will There Always Be Fish in the Sea? The U.S. Fishery Management Process*, 19 SUM NAT. RESOURCES & ENV'T 28, 32 (2004).
[179] *Id.*
[180] Bittleman, *supra* note 28, at 356.
[181] Cufone, *supra* note 178, at 32.
[182] *Id. See also* AMENDMENT 27/14 FSEIS, *supra* note 146, at 51 (allocating 4.65 million pounds to the commercial fishery and 4.47 million pounds to the recreational fishery).
[183] Amendment 27/14, 73 Fed. Reg. 5117, 5122 (Jan. 29, 2008) (to be codified at 50 C.F.R. pt. 622). As well as TACs, the directed fishery is regulated through the use of quotas, seasons, and size and bag limits.

2032.[184] While these amendments increased the allowable catch and lengthened the rebuilding deadline, the amendments simultaneously ignored regulation of shrimp bycatch.

Through the SFA, Congress mandated scientific review of the red snapper's status by independent scientists.[185] The report was released in 1997 and led to the official listing of red snapper as "overfished" in the first *Report to Congress on the Status of United States Fisheries (First Congressional Report)*.[186] Only after this listing did NMFS attempt to regulate shrimp bycatch through the separate 1998 implementation of Amendment 9 to the Shrimp FMP, which required that shrimp trawls install certified bycatch reduction devices (BRDs).[187] This amendment was adopted in response to the SFA's mandate to reduce bycatch.[188] Based upon the adoption of BRDs, the Council maintained the TAC of 9.12 million pounds.[189] The BRDs were assumed to achieve a forty percent reduction in red snapper bycatch from shrimp trawl nets.[190] In actuality, the BRDs reduced bycatch by less than twelve percent.[191]

2. Amendment 22

On March 29, 2005, the Coastal Conservation Association (CCA) filed a petition for emergency rulemaking to stop overfishing of Gulf red snapper with the U.S. Department of Commerce.[192] Therein, CCA asserted that ineffective bycatch reduction devices (BRDs) used by the commercial shrimp fishery made "the recovery of the Gulf red snapper fishery unlikely and ensure[d] years of continued overfishing."[193] Although acknowledging the necessity of shrimp bycatch reduction, the Department denied CCA's petition on September 7, 2005.[194]

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[184] Coastal Conservation Association v. Gutierrez, 512 F.Supp.2d 896, 899 (S.D. Tex. 2007). *See also* AMENDMENT 27/14 FSEIS, *supra* note 146, at 5-8. The Council originally proposed the target date of 2032 in a proposed plan submitted in 2001. NMFS rejected that amendment, instructing the Council to "further explore alternative rebuilding plans based on more realistic expectations concerning bycatch in the shrimp fishery." *CCA v. Gutierrez*, 512 F.Supp. at 899.

[185] Cufone, *supra* note 178, at 33.

[186] *Id.*

[187] Amendment 9, 63 Fed. Reg. 18,139 (April 14, 1998) (to be codified at 50 C.F.R. pt. 622).

[188] *Id.*

[189] Cufone, *supra* note 178, at 32.

[190] AMENDMENT 27/14 FSEIS, *supra* note 146, at 35.

[191] *Id.* NMFS admitted that "red snapper recovery efforts to date have been premised on at least a forty-four percent (44%) reduction … of mortality … [and] that prior to approval of Amendment 22 preliminary studies indicated that currently approved BRDs [reduced] red snapper bycatch … by about twelve percent." Memorandum in Support of Plaintiff Coastal Conservation Association's Motion for Summary Judgment at fn. 12, Coastal Conservation Association v. Gutierrez, 2006 WL 1791886 [hereinafter CCA Memorandum]. *See also* NOAA, STATUS OF BYCATCH REDUCTION DEVICE (BRD) PERFORMANCE AND RESEARCH IN NORTH-CENTRAL AND WESTERN GULF OF MEXICO, SEDAR7-DW-38 (2004).

[192] Red Snapper Emergency Rulemaking Petition, *supra* note 162. *See also* Petition for Action to Stop Overfishing of Red Snapper by the Gulf of Mexico Shrimp Fleet, March 29, 2005, *available at* http://www.joincca.org/CCA%20Petition.pdf .

[193] Red Snapper Emergency Rulemaking Petition, *supra* note 162, at 53,142.

[194] *Id.*

In the interim, Amendment 22 was published on June 2, 2005, more than sixty days after the approval date of March 9, 2005.[195] Amendment 22 instituted an observer program and made minor modifications to fishing vessel licensing requirements.[196] While purporting to "contribute to ending overfishing and rebuilding the red snapper resource,"[197] Amendment 22 lacked any new regulations to address shrimp trawl bycatch "or otherwise curtail and reverse the decline in red snapper stocks."[198] Amendment 22 did, however, set a target date for ending overfishing of the red snapper between 2009 and 2010.[199]

Most notably, the Gulf Council found that "[b]ased on [the] assessment and the best scientific information available at the time, no additional management measures would be required to rebuild the stock."[200] The Gulf Council based this conclusion on the following three assumptions: "(1) that the commercial shrimp fishery accounts for ninety percent of red snapper mortality; (2) that bycatch reduction devices (BRDs) are forty percent effective in reducing red snapper mortality in the shrimp fishery; and (3) that shrimping efforts in the Gulf of Mexico will be reduced by fifty percent during each of the years of the rebuilding plan."[201]

The rule was challenged in federal court by several environmental organizations, including CCA, arguing that NMFS violated the Administrative Procedures Act (APA) and the MSA by approving Amendment 22.[202] The Court agreed and found that adoption of Amendment 22 violated the law in two respects: (1) "The stock rebuilding plan … is inconsistent with the scientific data cited by the Gulf Council and has a less than fifty percent chance of rebuilding red snapper stocks by 2032;"[203] and (2) "Amendment 22 … violates [16 U.S.C. §] 1853(a)(11) by not, to the extent practicable, minimizing bycatch."[204]

i. The Stock Rebuilding Plan

The plan adopted by Amendment 22 depended upon a fifty percent reduction in shrimping effort. The court found this presumption inconsistent with the available science for two reasons. First, the relied upon economic studies only reflected an estimated thirty-nine percent reduction in shrimping effort.[205] Second, the relevant studies projected the

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[195] Red Snapper Rebuilding Plan, 70 Fed. Reg. 32,266 (June 2, 2005) (to be codified at 50 C.F.R. pt. 622); *See also* CCA Memorandum, *supra* note 191, at 12 (alleging that the publication was intentionally withheld to "stymie judicial review of the new regulations").
[196] Red Snapper Rebuilding Plan, *supra* note 195, at 32,267.
[197] *Id.*
[198] CCA Memorandum, *supra* note 191, at 12.
[199] Amendment 27/14, *supra* note 183, at 5119.
[200] Red Snapper Rebuilding Plan, *supra* note 195, at 32,267.
[201] *CCA v. Gutierrez*, 512 F.Supp.2d at 899 (citing 70 Fed. Reg. at 32,267).
[202] *Id.* at 900. Plaintiffs also alleged that NMFS violated NEPA and CCA argued that NMFS violated the APA and MSA by denying its petition for emergency rule making. The Court rejected these arguments. *Id.*
[203] *Id.*
[204] *Id.* at 901.
[205] *Id.* at 900. "These analysis predict a thirty-nine percent decrease in the number of full-time equivalent vessels (FTEVs) and a thirty-four percent decrease in nominal fishing effort in the shrimp fishery to occur by 2012." *Id.* at fn.7.

shrimping reduction to culminate in 2012.[206] By contrast, Amendment 22, relying upon these studies, projected its success based upon a fifty percent reduction beginning in 1999 and continuing until 2032.[207] Additionally, Amendment 22 established a target rebuilding date that was the longest legally permissible timeframe, placing "a premium on the accuracy of [the Council's] predictions."[208] Simply put, the court found these conclusions were unwarranted and contradicted by evidence before the Council and NMFS.[209]

ii. Shrimp Bycatch Reduction

The court also found that Amendment 22 failed to address bycatch. Pursuant to applicable law, FMPs must include "conservation and management measures that, to the extent practicable and in the following priority – (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided."[210] Instead, the Gulf Council avoided altogether "measures to reduce red snapper bycatch in the shrimp fishery by saying they will address the issue in the Shrimp Fishery Management Plan."[211] The court found this omission to be "contrary to the plain meaning of the statute."[212] Stating that the matter would be dealt with separately by the shrimp fishery plan was insufficient to comply with U.S. fishery management laws.

Having found Amendment 22 in violation of the law, the court remanded the matter to NMFS requiring that they, within nine months, promulgate a new plan that will have at least a fifty percent chance of success and will consider and adopt, to the extent practicable, measures to reduce shrimp trawl bycatch of red snapper.[213] Due to the complexity of the interrelated management programs, the court allowed NMFS to maintain the status quo while the new plan was developed.[214]

C. Recent Management Efforts

After a clear directive from the Court in *Coastal Conservation Association v. Gutierrez*, NMFS took significant steps to jointly manage the Gulf of Mexico red snapper and shrimp fisheries, including measures to meaningfully address bycatch.[215] Temporary rules were established to meet the court-mandated deadline of a new plan to end overfishing within nine months (December 9, 2007).[216] NMFS then issued the Joint Amendment 27 to the Reef

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[206] *Id.* In 2012, the shrimping effort decline is expected to reach an equilibrium. *Id.* at fn. 8.
[207] *Id.* at 901.
[208] *Id.*
[209] *Id.*
[210] 16 U.S.C. § 1853(a)(11).
[211] *CCA v. Gutierrez*, 512 F.Supp.2d at 901.
[212] *Id.*
[213] *Id.*
[214] *Id.* at 902.
[215] *Id.* at 899.
[216] Gulf Red Snapper Management Measures, 72 Fed. Reg. 15,617 (April 2, 2007) (to be codified at 50 C.F.R. pt. 622); Extension of Effective Date of Gulf Red Snapper Management Measures, 72 Fed. Reg. 54,223 (Sept. 24, 2007) (to be codified at 50 C.F.R. pt. 622). Measures included reducing the recreational quota to 3.185 million pounds and reducing the recreational season to April 21 through October 31.

Fish FMP and Amendment 14 to the Gulf of Mexico Shrimp FMP (Amendment 27/14) on January 29, 2008.[217]

1. Amendment 27/14

The stated objective of Amendment 27/14 is "to reduce the red snapper catch, bycatch, and discard mortality in the reef fish and shrimp fisheries, end overfishing of red snapper by 2010, and rebuild the red snapper stock by 2032."[218] NMFS projects that the plan has a probability of slightly greater than fifty percent of ending overfishing if managers strictly adhere to each element of the plan.[219] The commercial quota is reduced from 4.65 million pounds to 2.55 million pounds and the recreational quota from 4.47 million pounds to 2.45 million pounds.[220] The total directed fishery is thereby reduced to 5.0 million pounds. Amendment 27/14 also reduces minimum size in the commercial fishery, reduces recreational bag limits, and implements minor gear restrictions.[221]

At the same time that reductions in the directed fishery are occurring, access to the fishery is also being limited. By 1992, the red snapper fishery had devolved into a derby-style fishing situation with fishermen racing to catch a share of the quota.[222] For instance, a fifty percent increase in the commercial quota between 1990 and 2000 still resulted in a three-quarter reduction in season length (from 365 days to 76 days).[223] As a result, the Gulf Council developed options for an individual fishing quota (IFQ) program for this fishery and through Amendment 26 to the Reef Fish FMP, implemented a commercial IFQ program in January 2007.[224] Although anticipated benefits include bycatch reduction and the elimination of quota overages, bycatch remains a problem.[225]

To address bycatch, Amendment 27/14 establishes an administrative process through which closures may be implemented, if necessary. Specifically, the Amendment "provides for implementing seasonal closures of the Gulf shrimp fishery to reduce red snapper bycatch based upon the seventy-four percent bycatch reduction target established."[226] The projected reduction includes those obtained through BRDs and reduced mortality resulting from a reduced fishing effort.[227] Reliance on BRDs for bycatch reduction was questioned by the Environmental Protection Agency (EPA) when conducting its National Environmental

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[217] Amendment 27/14, *supra* note 183, at 5117.
[218] *Id.* at 5120.
[219] Closure of the 2008 Gulf of Mexico Recreational Fishery for Red Snapper, 73 Fed. Reg. 15,674, 15,675 (March 25, 2008) (to be codified at 50 C.F.R. pt. 622) [hereinafter 2008 Recreational Closure].
[220] Amendment 27/14, *supra* note 183, at 5122.
[221] *Id.* at 5117.
[222] SEDAR 7, *supra* note 8, at 11.
[223] *Id.*
[224] GULF OF MEXICO FISHERY MANAGEMENT COUNCIL, FINAL AMENDMENT 26 TO THE REEF FISH MANAGEMENT PLAN TO ESTABLISH A RED SNAPPER INDIVIDUAL FISHING QUOTA PROGRAM, 19 (2006); *See also* PEW ENVIRONMENT GROUP, *supra* note 26, at 13.
[225] NMFS, 2008 GULF OF MEXICO RED SNAPPER INDIVIDUAL FISHING QUOTA ANNUAL REPORT, 18 (2009), *available at* http://sero.nmfs.noaa.gov/sf/pdfs/2008RedSnapperIFQAnnualReport1.pdf; *See also* PEW ENVIRONMENTAL GROUP, *supra* note 26.
[226] Amendment 27/14, *supra* note 183, at 5117-18. Referring to seventy-four percent below the benchmark years of 2001-2003. *Id.* at 5121.
[227] *Id.* at 5122.

Policy Act (NEPA) review prior to the issuance of the final rule: "We are pleasantly surprised that the improved BRDs in shrimp trawls are expected to dramatically reduce the bycatch of juvenile red snapper. However, we recommend that the function and effectiveness of these improved BRDs be explained in the FSEIS as they relate to reducing juvenile red snapper bycatch."[228] NMFS accordingly addressed the matter by noting that new BRD certification criterion would be established in 2007.[229]

Overall, NMFS determined that current external factors such as destructive hurricanes, rising fuel costs, and an economic downturn sufficiently reduced the shrimping effort to the extent that no current shrimp fishery closures were warranted.[230] Shrimping effort decline is expected to continue through 2012.[231] Consequently, NMFS reduced the red snapper directed fishery effort but found no need for current reductions in the shrimping effort. Should these projections underestimate the bycatch reductions, NMFS may later implement seasonal closures in the shrimp industry.

2. Post-Amendment 27/14

The assumptions of Amendment 27/14 proved unreliable as early as March 25, 2008 when NMFS issued an early closure of the recreational red snapper fishery.[232] Under Amendment 27/14, the recreational red snapper quota was reduced to 2.45 million pounds,[233] the bag limit was set at two fish per person, and the federal fishing season was limited to June 1 through September 30.[234] In promulgating Amendment 27/14, NMFS relied upon the unrealized assumption that the five Gulf States would adopt regulations compatible with the federal red snapper FMP.[235]

Florida reduced the bag limit but the Florida Fish and Wildlife Conservation Commission (FWC) allowed for a recreational fishing season seventy-eight days longer than the federal season.[236] Texas maintained a renegade attitude, continuing with a year-round fishing season and a four-fish bag limit.[237] Based on these state actions, NMFS reevaluated projected red snapper landings and determined federal recreational landings would account for seventy-two percent of the total quota while state recreational fisheries would land nearly forty-one percent of the total recreational quota, resulting in a thirteen percent

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[228] AMENDMENT 27/14 FSEIS, *supra* note 146, at app. F, F-5 (Letter from Heinz J. Mueller, NEPA Program Office Chief, U.S. Environmental Protection Agency, to Dr. Roy E. Crabtree, Regional Administrator, National Marine Fisheries Service (May 22, 2007)).

[229] AMENDMENT 27/14 FSEIS, *supra* note 146, at 35. "Based on a new BRD certification criterion to be established in 2007, new and more effective BRDs will be certified for use in the fishery."

[230] *Id.* at 37. "This is because the economic downturn in the shrimp fishery, coupled with increased fuel costs and hurricane damage to vessels and infrastructure, reduced effort from the benchmark years by nearly 60 percent in 2005 and 65 percent in 2006." 73 Fed. Reg. at 5121.

[231] AMENDMENT 27/14 FSEIS, *supra* note 146, at 37.

[232] 2008 Recreational Closure, *supra* note 219, at 15,674.

[233] 50 C.F.R. § 622.42(a)(2).

[234] 2008 Recreational Closure, *supra* note 219, at 15,674. The recreational quota of 2.45 million pounds includes fish landed from both federal and state waters.

[235] *Id.* at 15,674-75.

[236] *Id.* Florida's 2008 recreational red snapper fishing season extends from April 15 through October 31.

[237] *Id.*

overage.[238] NMFS further acknowledged "the projections are likely to represent an underestimate of the quantity of red snapper expected to be landed by the recreational fishery during 2008."[239] As a result, NMFS, acting in accordance with 50 C.F.R. § 622.43(a), effectuated an early closure of the 2008 recreational red snapper fishery, thereby reducing the planned 122-day season by 57 days, almost half.[240] Less than two months after the issuance of the final rule, the lack of cohesive regional management resulted in ineffective federal management efforts.

V. Application of EBM to the Red Snapper and Shrimp Fisheries

A. Regional Management

While regional councils under the MSA provide geographic consistency within federal fisheries, true consistency cannot be achieved without state coordination. As illustrated by the early closure of the 2008 recreational red snapper fishery, lack of cohesion between state and federal management plans presents potentially insurmountable hurdles to stock rebuilding. To overcome this impediment, federal and state agencies must work together to structure a rebuilding plan for red snapper.

Coordination may be achieved by increasing the role of the Gulf States Marine Fishery Commission (Gulf Commission) and placing the Gulf red snapper fishery and shrimp fishery under its authority. As recommended by the 2004 Ocean Commission Report,[241] providing the Gulf Commission with statutory authority similar to that of the ASMFA would allow for development of interstate management plans that adhere to the MSA.[242] Through this framework, the ASMFC has successfully managed fisheries under its jurisdiction[243] suggesting that a similarly authorized Gulf Commission would enjoy equal success.

B. Moving Beyond Single-Species Approach

Although Amendment 27/14 affects both the shrimp and red snapper, the general application is still one of single-species management. Amendment 27/14 takes incremental steps towards bycatch reduction, addressing bycatch in the directed fishery and reducing the overall bycatch reduction level to seventy-four percent.[244] The Amendment did not address new BRD device certification. By separate measure, NMFS revised BRD certification for the western Gulf of Mexico, effective March 14, 2008.[245] The new rule certifies the Modified Jones-Davis BRD and provisionally certifies two other devices.[246]

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[238] *Id.* at 15,674.
[239] *Id.*
[240] *Id.* at 15,675.
[241] USCOP REPORT, *supra* note 2, at 241.
[242] Farside, *supra* note 33, at 231.
[243] *Id.* at 237.
[244] Amendment 27/14, supra note 183, at 5117.
[245] Revisions to Bycatch Reduction Devices and Testing Protocols, 73 Fed. Reg. 8219 (Feb. 13, 2008) (to be codified at 50 C.F.R. pt. 622) [hereinafter BRD Revisions].
[246] *Id.* at 8222.

In adopting the final rule, the Council changed its current bycatch reduction criterion status quo – the juvenile red snapper fishing mortality reduction.[247] NMFS found that "[m]aintaining the status quo will result in the decertification of all currently certified BRDs except the Jones-Davis BRD."[248] NMFS acknowledged that two of the three certified devices insufficiently reduce juvenile red snapper mortality: "Current data indicate these BRDs do not meet the status quo bycatch reduction criterion."[249] The criterion change is justified on the basis that decertification under the status quo would result in "greater [shrimp] industry-wide replacement costs" than the final rule.[250] Under the new rule, the controversial fisheye BRD, which achieves less than a twelve percent reduction in juvenile red snapper bycatch, may continue to be used, although in a different configuration.[251]

Had the Gulf Council promulgated these measures jointly within Amendment 27/14, the relationship to red snapper mortality would have to be explained.[252] Instead, this separate rule under the shrimp FMP allows the Gulf Council to amend BRD standards to favor shrimpers to the peril of the red snapper without sufficiently addressing the issue. Multispecies management would necessitate consideration of both species in making this type of management decision. While multi-species management may not prevent decisions like the new BRD rule, it would encourage consideration of other species when making determinations.

C. Adaptive Management

Though Amendment 27/14 has its limitations, the regulation successfully incorporates adaptive management principles. Specific instances of adaptive management include provisions for reevaluating the fisheries' status and implementation of regional shrimp closures when necessary.[253] The final rule specifically provides for an annual assessment of the shrimp effort and associated red snapper bycatch and establishes a framework procedure and authority "to adjust the target shrimp bycatch reduction and effort levels and time-area closures."[254] The new BRD certification rule equally incorporates adaptive management by providing for provisional certification of devices while studying their effectiveness.[255]

D. Increased Role of Science

Under the MSA, Councils are required to use "the best available science" when developing conservation measures.[256] However, the development of conservation measures remains in

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[247] *Id.*
[248] *Id.*
[249] *Id.*
[250] *Id.*
[251] *Id.* "[T]he cheapest and currently most commonly used BRD, a fisheye-type BRD, could continue to be used in a different configuration." *Id.* Effects of the new configuration on juvenile red snapper are currently unknown.
[252] AMENDMENT 27/14 FSEIS, *supra* note 146, at app. F.
[253] Amendment 27/14, *supra* note 183, at 5121.
[254] *Id.* at 5123; *See also* 50 C.F.R. 622.34 (establishing procedure for seasonal closures).
[255] BRD Revisions, *supra* note 245, at 8222.
[256] 16 U.S.C. § 1851(a)(2) (2007).

the hands of the politically motivated Councils rather than scientists and/or agency technical experts more qualified to base decisions on ecological considerations.[257]

As previously discussed, regional management councils are comprised of a variety of individuals, including stakeholders. The Gulf Council is no exception. Of the seventeen voting members of the Gulf Council, eight members are directly affiliated with the fishing industry (either recreational or commercial), six members are representatives of state fishery programs, two members belong to the scientific community, and NMFS has one voting member.[258] Industry stakeholders outnumber scientists four to one. Past failures to address shrimp bycatch within the red snapper fishery could be attributed to this Council composition. In addition, the Gulf shrimp fishery is one of the most economically important fisheries within the United States providing fishery stakeholders further disincentive to regulate shrimp bycatch .[259]

Statutory language governing council membership calls for "individuals 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."[260] While this language has been historically interpreted to limit council membership to recreational and commercial fishing interests, the language should be used to select council members from a broad spectrum of interests.[261] Councils should be diversified to include public interests including conservationists and persons with greater expertise for developing scientific consensus.[262] Diversifying council membership could increase support for new conservation measures and management objectives.[263] A less economically, or politically, motivated council would be more likely to implement decisions based on sound scientific research.

E. Lessons

The competing interests of the Gulf of Mexico red snapper and shrimp fisheries illustrate the need for stronger mandatory MSA provisions that incorporate the guiding principles of EBM. The current Gulf Council makeup lacks political will to meaningfully address juvenile red snapper bycatch in the shrimp industry. Past regulatory efforts failed because the interactions of the two fisheries were not addressed. Amendment 27/14 and subsequent administrative rules addressing seasonal closures and BRD certification represent a substantial step towards EBM of these competing fishery interests. While some existing management tools addressing red snapper recovery are newly implemented and untested, recent stock assessments show signs of recovery in the Gulf red snapper fishery.[264]

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[257] Kass, *supra* note 16, at 54.
[258] Gulf Council membership, *available at* http://www.gulfcouncil.org/ (last visited Dec. 18, 2009).
[259] SEDAR 7, *supra* note 8, at 14.
[260] 16 U.S.C. § 1852(b)(2)(A).
[261] Cufone, *supra* note 178, at 35.
[262] Fleming & Crawford, *supra* note 134, at 85.
[263] *Id.; See also* Cufone, *supra* note 178, at 35. Cufone advocates another proposed solution: transfer the decision making to NMFS's technical experts. *Id.* This author is unconvinced by this argument because it would discourage regional management.
[264] Press Release, NOAA, Gulf of Mexico Red Snapper Recovering (Dec. 11, 2009), *available at* http://www.noaanews.noaa.gov/stories2009/20091211_redsnapper.html .

However, the Gulf Council avoided hard decisions with respect to the shrimp fishery because effort was suppressed by unrelated economic conditions. As the shrimp market recovers over time, the regulatory mettle of the Gulf Council may again be tested should additional measures be needed to end overfishing of the Gulf red snapper.

Implementing EBM within the Gulf red snapper and shrimp fisheries requires transitioning from current incongruent single-species management to multi-species management. New management regimes should increase scientific study and address bycatch reduction on a regional basis, coordinating state and federal efforts. To improve the role of science, regional councils must reduce the influence of fishery stakeholders while heightening the role of scientists in management decisions.