

Stakeholder Attitudes Toward Ecosystem-based Fisheries Management

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“Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term” (Grumbine, 1994:31).

“Ecosystem management is management that is adaptive, is specified geographically, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse social objectives” (NOAA¹).

An Ecosystem Approach to Management

Ecosystem management is widely acknowledged as a holistic approach to natural resource management—an approach that considers interactions between physical, biological, and human components of an ecosystem and promotes ecosystem health and long-term sustainability (Mace, 2004;

Pikitch et al., 2004; U.S. Commission on Ocean Policy, 2004; Agardy, 2005; Tudela and Short, 2005; Murawski, 2007). Currently, the approach is a popular prescription to remedy stress and deterioration in marine ecosystems, and it is frequently referenced as necessary in the evolution of marine fisheries management (Brodziak and Link, 2002; Hilborn et al., 2004; Pikitch et al., 2004).

Although an ecosystem approach to fisheries management has received increasing attention during the last decade, ecosystem management itself is far from novel. In 1970, policy analyst Lyndon Caldwell suggested using ecosystems as a basis for land management, noting that such a shift would require a reconfiguration of the conventional (political) system (Grumbine, 1994). Though an immediate shift did not ensue, by the late 1980’s an ecosystem approach to land management was supported by many scientists and managers (Grumbine, 1994) and by the mid-1990’s ecosystem activities (focused primarily on managing terrestrial or freshwater ecosystems) were underway in 18 federal agencies and many state agencies and private firms (Morrissey et al., 1994).

Ubiquitous calls for an ecosystem approach for managing marine resources followed (EPAP, 1999; Pikitch et al., 2004) many of which advocated that humans are part of the ecosystem—a relatively novel concept for fisheries management—and thus relationships between human and non-human elements must be accounted for in a management paradigm (Busch et al.²). Though localized examples of ecosystem approaches to fisheries management may have existed prior to 1995, the United Nations Food and Agriculture Organization’s Code of Conduct for Responsible Fisheries (FAO, 1995) marked an important step in establishing a framework for ecosystem considerations in fisheries management. This framework, in part, promoted the establishment of principles for responsible fishing and fisheries conservation, the protection of living aquatic resources and their environments, and research on fisheries and their associated ecosystems (FAO, 1995).

In the ensuing years, much literature was published on almost every aspect of an ecosystem approach to fisheries management (EAFM), including what it is and how it should or could be implemented (Link, 2002; Francis

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ABSTRACT—NOAA’s National Marine Fisheries Service (NMFS) conducted a survey of fisheries stakeholders on the Gulf and East Coasts of the United States to learn their views on ecosystem-based fisheries management (EBFM) of fisheries resources. The survey asked a series of attitude and opinion questions along with general environmental literacy and demographic questions to a sample of 7,850 fisheries stakeholders, stratified by region. Results indicate that respondents’ knowledge of the status of fisheries resources is qualitatively similar to NMFS ratings, though generally respondents were less than satisfied with current fisheries management. Results also suggest that, despite concerns over several specific measures, respondents generally see potential in an EBFM approach to management.

¹NOAA. 2004. New priorities for the 21st century. National Marine Fisheries Service Strategic Plan updated for FY 2005–FY 2010. U.S. Dep. Commer., NOAA, 19 p. (avail. from the NOAA Central Library and online at: <http://www.nmfs.noaa.gov/mb/strategic/NMFSstrategicplan200510.pdf>).

²Busch, W.-D. N., B. L. Brown, and G. F. Mayer (Editors). 2003. Strategic guidance for implementing an ecosystem-based approach to fisheries management. U.S. Dep. Commer., NOAA, NMFS, Silver Spring, MD, 62 p. Avail. online at http://www.nmfs.noaa.gov/ocs/mafac/meetings/2003_05/mafac_rev_5th_7Finalwref.pdf.

et al., 2007; Sanchirico³). Although no universal definition of EAFM exists, many scientists agree that monitoring and adaptive management, ecological integrity, ecological boundaries, accounting for uncertainty, balancing diverse societal needs, and the consideration of future generations are important principles that EAFM should address (Brodziak and Link, 2002; Sissenwine and Murawski, 2004; Garcia and Cochrane, 2005; EPAP, 1999).

Today many agencies charged with managing marine systems are adopting an ecosystem approach or are incorporating key principles of the approach. NOAA's National Marine Fisheries Service (NMFS) is among those agencies moving toward EAFM, stating its goal to "protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management" in its strategic plan (NMFS, 2007). Though U.S. fisheries management has traditionally focused on management of a single species or species complex, the adoption of EAFM is not an about-face in management style; rather, it is a move along the continuum of the management spectrum bounded by single-species management at one end and ecosystem management at the other.

NOAA defines an ecosystem approach to management as one that is "adaptive, geographically specified, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse societal objectives" (NOAA¹). And while defining an ecosystem approach is no easy task, implementing the approach may be even more challenging. The following quotes (cited in Bengston et al., 2001) illustrate sentiments toward terrestrial ecosystem management, and there is no evidence that implementing ecosystem management for marine systems will be easier.

³Sanchirico, J. N., M. D. Smith, and D. W. Lipton. 2006. An approach to ecosystem based fishery management. Resources for the Future Discussion Paper, RFF DP 06-40, Wash. D.C., 30 p. (Avail. online at: <https://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-06-40.pdf>).

"Personally, I think that ecosystem management is an appropriate management policy, but the way it has been implemented has unnecessarily interrupted nearly a century of progressive forest management." (MacWilliams, 1997).

"Many fishery and wildlife managers now accept the whole-ecosystem view in principle, but practicing it is a different matter." (Radin, 1997).

In 2007 Francis et al. offered ten action items which they suggest will help bridge the gap between general principles of EAFM and specific methodologies (Francis et al., 2007). With one exception these action items address only the natural sciences; however, difficulties in implementation often arise over competing management objectives and the preferences of different stakeholder groups.⁴ This underscores the importance of understanding what it is that stakeholders desire from an ecosystem approach to management, and what types of objectives are preferred by which stakeholders. Social science research can help managers understand the diversity of stakeholder preferences concerning EAFM. Prior research has shown predominantly favorable attitudes toward ecosystem management in the context of terrestrial ecosystems (Steel et al., 1994; Manning et al., 1999; Bengston et al., 2001), though less is known about fisheries stakeholders' attitudes, opinions, and concerns about an ecosystem approach to managing fisheries.

In 2010, President Obama signed Executive Order 13547 establishing the National Ocean Policy, with one of the primary objectives to adopt an ecosystem-approach to managing the nation's coasts and oceans.⁵ While there are limited formal assessments of what fisheries stakeholders think of current management, such an assessment

⁴For purposes of this paper, we define stakeholder as those interested and involved in the fishery management process, more specifically the federal Fishery Management Councils.

⁵More information on the National Ocean Policy Implementation Plan may be found online at <http://www.whitehouse.gov/administration/eop/oceans/policy> (accessed 2 Apr. 2014).

could help managers focus on specific areas or objectives that may need attention when developing guidelines and implementing EAFM.

Surveying Stakeholder Opinions

To understand what fisheries stakeholders think about both current and ecosystem-based management, the NMFS conducted a mail questionnaire of fisheries stakeholders beginning in April 2006 (see Appendix). A sampling frame of stakeholders was developed through coordination with the New England, Mid-Atlantic, South Atlantic, and Gulf of Mexico Fishery Management Councils and relied primarily on mailing lists maintained by the Councils' and NMFS Office of Constituent Services. The frame ($n \approx 18,000$) consisted of six primary types of stakeholders: aquaculture (4% of frame); seafood importer/exporter/wholesaler (10%); commercial fishermen (36%); academic and non-NOAA scientific (16%); non-governmental organizations (3%); other (31%). The "other" category consisted largely of private citizens who had previously expressed an interest in marine management by attending a Fishery Management Council (FMC) meeting or writing or phoning an FMC, the Atlantic States Marine Fisheries Commission, or NOAA.

Four regional-specific survey versions were developed for New England (Connecticut, Rhode Island, Massachusetts, New Hampshire, and Maine), the Mid-Atlantic (North Carolina, Virginia, Maryland, Delaware, Pennsylvania, New Jersey, and New York), the South Atlantic (North Carolina, South Carolina, Georgia, and the east coast of Florida down to Key West), and the Gulf of Mexico (west coast of Florida, Alabama, Mississippi, Louisiana, and Texas). Surveys were developed with collaboration with each region's FMC. Each survey contained five sections: Section A gauged respondents participation in and awareness of fisheries management; Section B assessed respondents opinions of current fisheries management for regionally specific fish and protected species stocks;

Table 1.—Mail returns by disposition.

Disposition	No. returned surveys
Initial surveys mailed	7,850
Refused	42
Undeliverable ¹	1,379
Completed Surveys	2,296
Final Response rate	35%

¹Undeliverable includes those surveys that were non-deliverable (incorrect address) or the respondent was deceased.

Section C examined respondents preferences for the types of goals and objectives that should be pursued within a fisheries management framework and asked them about their satisfaction with current management; Section D asked respondents about their expectations related to ecosystem based management; and Section E collected demographic data. Section B was the only section of the survey that varied by region. The survey instrument was tested with two focus groups in Delaware and two focus groups in Florida and refined based on focus group feedback.

Survey administration followed a modified Dillman Design (Dillman, 2007). Each respondent was mailed a pre-notification letter which explained the survey, described how the data would be used, and encouraged cooperation. Within five days, a survey instrument with a cover letter was sent to each respondent. One week after this mailing, a postcard was mailed to all respondents thanking those who had completed the survey, and encouraging those who had not completed it to do so. Finally, two weeks after the initial mailing, a second survey instrument was sent to all non-respondents, with a modified cover letter. A customized tracking database system was used to log mail returns and track survey progress. Initially, 7,850 surveys were sent in the first mailing. By the end of the mailings, 2,296 surveys were returned for a response rate of 35% (Table 1).

Following administration of the survey, a non-response bias check was completed. Thirty-seven percent of the undeliverable records were matched with a telephone record. In addition to a few demographic questions, selected

content questions from the mail survey were included in the telephone non-response questionnaire. Mail respondents tended to report higher education levels, higher incomes, and were more likely to include female respondents.

Percentage responses are reported for the survey questions. The results present the percentages of those responding to a question. No further statistical analysis was completed; therefore there are no standard errors or goodness of fit estimates to present.

Stakeholder Opinions: The Good, the Bad, and the Unsure

The Good

Respondents were asked about their opinion of the status and management of selected fish stocks (or stock complexes) that occur in their region of residence (Table 2). Respondents were

asked whether they believed a stock was stable, overfished but recovering, or overfished and not recovering, and also asked to rate the current management of selected stocks using a scale of excellent, good, fair, or poor. The response “I am unsure” was also available for both status and management questions. Stakeholder ratings of the status of fish stocks were compared to the NMFS Fish Stock Sustainability Index (FSSI), an index used by NMFS to measure the sustainability of over 230 separate stocks. The FSSI is calculated by assigning a score for each stock based on five criteria: 1) whether the stock status is known, 2) whether the stock is overfished, 3) whether the stock is subject to overfishing, 4) whether the stock biomass is above the point defined as overfished, and 5) whether the stock biomass is 80% or more of the biomass required to produce maximum sustainable yield. The

Table 2.—Fish stocks rated by stakeholders in the four surveyed regions.

North Atlantic	Mid-Atlantic	South Atlantic	Gulf of Mexico
Atlantic sea scallop, <i>Plactopecten magellanicus</i>	Summer flounder, <i>Paralichthys dentatus</i>	Mahi mahi, <i>Coryphaena hippurus</i>	Red drum, <i>Sciaenops ocellatus</i>
Groundfish ¹	Black sea bass, <i>Centropristis striata</i>	Spiny lobster, <i>Panulirus argus</i>	Spiny lobster, <i>Panulirus argus</i>
Whiting/red hake ²	Bluefish, <i>Pomatomus saltatrix</i>	Snapper/grouper ⁴	Snapper/grouper ⁶
Goosefish (monkfish), <i>Lophius americanus</i>	Golden tilefish, <i>Lopholatilus chamaeleonticeps</i>	Mackerel, <i>Scomberomorus cavalla</i> and <i>S. maculatus</i>	Mackerel, <i>Scomberomorus cavalla</i> and <i>S. maculatus</i>
Red crab, <i>Chaceon quinquegens</i>	Atlantic mackerel, <i>Scomber scombrus</i>	Shrimp ⁵	Shrimp ⁷
Atlantic herring, <i>Clupea harengus</i>	Squid, <i>Loligo pealeii</i> and <i>Illex illecebrosus</i>		
Atlantic salmon, <i>Salmo salar</i>	Butterfish, <i>Peprilus triacanthus</i>		
Skates ³	Atlantic surfclam, <i>Spisula solidissima</i>		
	Ocean quahog, <i>Arctica islandica</i>		
	Spiny dogfish, <i>Squalus acanthias</i>		
	Scup, <i>Stenotomus chrysops</i>		

¹Groundfish refers to a complex of 15 species, for more information, visit, <http://www.nero.noaa.gov/nero/fishermen/images/Multispecies/index.html>, accessed 2 Apr. 2014.

²Whiting/red hake refer to silver hake, *Merluccius bilinearis*; offshore hake, *M. albidus*; red hake, *Urophycis chuss*.

³Skates refer to the Northeast skate complex, which comprises seven species. For more information, visit, <http://www.nero.noaa.gov/nero/fishermen/images/skates/>, accessed 2 Apr. 2014.

⁴Snapper/grouper refers to 14 species of snappers and 20 species of groupers in the South Atlantic snapper/grouper complex managed by the South Atlantic Council, for more information, visit http://safmc.net/sites/default/files/SAFMC_ManagedSpecies_12182012.pdf, accessed 2 Apr. 2014.

⁵Shrimp refers to rock shrimp and three species of penaeid shrimp managed by the South Atlantic Council, for more information, visit <http://safmc.net/fish-id-and-regs/regulations-species#Species%20Regs>, accessed 2 Apr. 2014.

⁶Snapper/grouper refers to 11 species of snappers and 11 species of groupers in the Gulf reef fish complex managed by the Gulf Council, for more information, visit <http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/species%20managed.pdf>, accessed 2 Apr. 2014.

⁷Shrimp refers to four species of shrimp managed by the Gulf Council, for more information, visit <http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/species%20managed.pdf>, accessed 2 Apr. 2014.

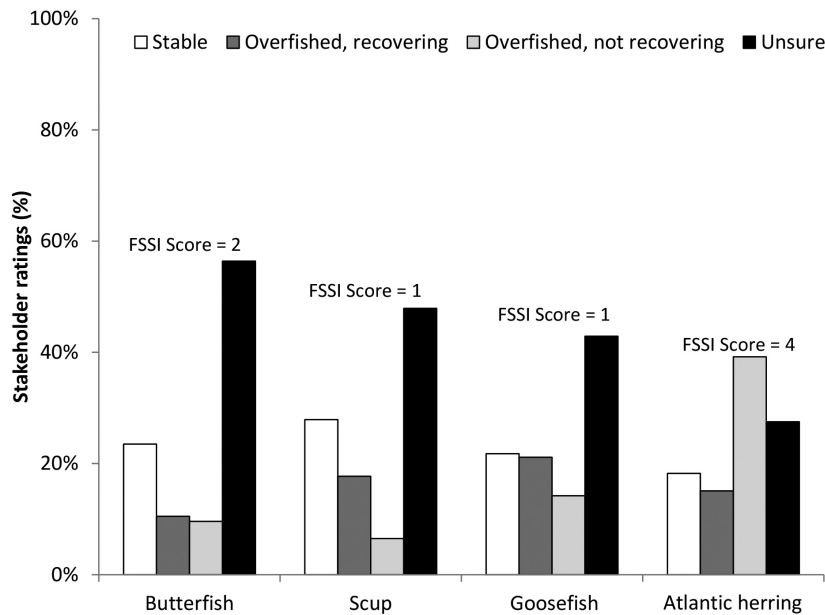


Figure 1.—Stakeholder ratings of the status of the four stocks for which their ratings were inconsistent with FSSI scores.

maximum FSSI score a stock can receive is four, denoting the highest level of sustainability. The lowest sustainability score a stock can receive is zero.⁶

In the Gulf of Mexico and South Atlantic regions, ratings of fish stock status were considered consistent with FSSI scores. For the Mid-Atlantic region, respondent assessments were consistent with FSSI scores for all but two fish stocks: butterflyfish, *Pepirus triacanthus*, and scup, *Stenotomus chrysops* (Fig. 1). Ratings were considered inconsistent for these two stocks primarily due to the high percentage (nearly 50%) of respondents who chose “I am unsure” for the status of these stocks. In the North Atlantic region, ratings of stock status were considered consistent with FSSI scores for all but two stocks: Atlantic herring, *Clupea harengus*, and goosefish (monkfish), *Lophius americanus*. Ratings were considered inconsistent

for goosefish due to the high percentage (> 40%) of unsure responses; however, ratings for Atlantic herring were considerably different than those assigned by the FSSI score. In November 2006, the FSSI score for Atlantic herring was four, the highest possible sustainability score. However, nearly 40% of respondents rated the status of Atlantic herring as overfished and not recovering. With the exception of the four fish stocks cited above, assessments of selected stocks were not considerably different than the assessments by NMFS.

When a respondent rated the current management of the selected stocks, ratings were excellent, good, or fair for many of the stocks.

- North Atlantic management of Atlantic sea scallops, *Plactopecten magellanicus*, received the highest rating, with nearly 54% of respondents rating management as excellent or good. Other stocks that received excellent or good management ratings included goosefish, whiting, *Merlangius merlangus*, and red hake, *Urophycis chuss*.

- Mid-Atlantic management of bluefish, *Pomatomus saltatrix*, received the highest rating, with nearly 52% of respondents rating management as excellent or good. Other stocks that received excellent or good management ratings included black sea bass, *Centropristis striata*; summer flounder, *Paralichthys dentatus*; and Atlantic mackerel, *Scomber scombrus*.
- South Atlantic management of mackerel received the highest rating, with nearly 54% of respondents rating management as excellent or good. Management received excellent or good marks for all stocks rated in this region.
- Gulf of Mexico management of red drum, *Sciaenops ocellatus*, received very high ratings, with 68% of respondents rating the management of this stock as either excellent or good. Excluding spiny lobster, *Panulirus argus*, which received a large number of unsure responses, management received excellent or good ratings for stocks rated in this region.

In addition, respondents were asked about their level of satisfaction with 22 different types of management objectives, broadly categorized as either biological/ecological, social/economic, or institutional (Tables 3 and 4). Many of these were objectives that are often discussed in relation to implementing an ecosystem approach to management. In all regions, two objectives, protect sensitive species such as marine mammals and sea turtles and maintain public access to the marine environment received excellent or good ratings by a majority (>50%) of stakeholders in the region (Table 3). In the Gulf of Mexico region, five additional objectives received excellent or good ratings.

In summary, respondents appear to have a good knowledge of the status of many of the selected stocks in their region, and in two regions, the South Atlantic and Gulf of Mexico, respondents rated management as excellent or good for most of the selected stocks. In the North Atlantic and

⁶More information on the FSSI is available at <http://www.whitehouse.gov/sites/default/files/omb/assets/OMB/expectmore/detail/10000036.2007.html> and at <http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm> (accessed 2 Apr. 2014).

Table 3.—Management activities that received satisfactory¹ ratings from a majority (>50%) of stakeholders.

Management activity	Stakeholders (%) who rated activity as satisfactory			
	North Atlantic	Mid-Atlantic	South Atlantic	Gulf of Mexico
Protect sensitive species, such as marine mammals and sea turtles	61	55	67	64
Maintain public access to the marine environment	57	56	58	57
Ensure that regulations are monitored and enforced				56
Reduce marine pollution				54
Inform the public about the marine environment and how it is managed				52
Protect habitat necessary for fish spawning, breeding, feeding, and growth				52
Undertake research to understand relationships among different parts of the marine environment				51

¹Satisfactory is defined as a survey response of “somewhat satisfied” or “extremely satisfied.”

Mid-Atlantic regions, management of one-third to one-half of the stocks received excellent or good ratings. When management was rated on 22 objectives that were more general in nature, many of which represented components of an ecosystem approach, the Gulf of Mexico fared the best, with management receiving an excellent or good rating for about one-third of the objectives.

The Bad

Management of three stocks, all in the North and Mid-Atlantic regions, was rated unsatisfactory. These stocks were groundfish and Atlantic herring, in the North Atlantic, and spiny dogfish, *Squalus acanthias*, in the Mid-Atlantic. In the North Atlantic region, 43% of respondents rated the management of groundfish as poor, and 40% rated management of Atlantic herring as poor. In the Mid-Atlantic, 37% of respondents rated the management of spiny dogfish as poor.

In general, respondents in the North, Mid-, and South Atlantic regions were less than satisfied with about a third to almost half of the management objectives they were asked to rate, depending on the region (Table 4). In the Gulf of Mexico, only two objectives received a less than satisfied rating by more than 50% of the stakeholders.

In summary, while respondents seem fairly satisfied with the management of specific stocks, in the North Atlantic, Mid-Atlantic, and South Atlantic regions they appear less than

satisfied with the way current management addresses a number of objectives. Further, many of these objectives would fit squarely within an ecosystem approach to management.

The Unsure

There were a number of stocks, especially in the North Atlantic and Mid-Atlantic regions, for which stakeholders were unsure of the performance of current management. Management of the following stocks received a rating of unsure by more than 40% of respondents in the North Atlantic or Mid-Atlantic region: red crab, *Chaceon quinquegens*; Atlantic salmon, *Salmo salar*; skates (Rajidae); golden tilefish, *Lopholatilus chamae-*

leonticeps; squid, *Loligo pealeii* and *Illex illecebrosus*; butterflyfish, *Peprilus triacanthus*; Atlantic surfclam, *Spisula solidissima*; ocean quahog, *Arctica islandica*; and scup, *Stenotomus chrysops*. In the Gulf of Mexico and South Atlantic, about 60% and 37% of respondents, respectively, were unsure about the management of spiny lobster.

Ratings of the 22 management objectives showed that most respondents were fairly certain about their opinion of management, be it excellent/good or fair/poor. For example, no region had a proportion of unsure responses that was greater than 35%, and in each region there were only three objectives of which more than 25% of respondents said they were unsure about current management.

- North Atlantic, Mid-Atlantic, and South Atlantic objectives for which over 25% of respondents were unsure of included 1) reduce non-native species introduction, 2) set aside a portion of the fishing quota as prey for marine mammals and endangered species, and 3) allocate harvest privileges to fishermen using individual fishing quotas.
- Gulf of Mexico: objectives for which over 25% of respondents were unsure of included 1) re-

Table 4.—Management activities that received unsatisfactory¹ ratings from a majority (>50%) of stakeholders.

Management activity	Stakeholders (%) who rated activity as unsatisfactory			
	North Atlantic	Mid-Atlantic	South Atlantic	Gulf of Mexico
Minimize bycatch	59	59	58	
Maintain fishing-dependent communities	59		51	
Minimize adverse economic impacts to stakeholders	57	53		51
Restore depleted fish stocks	57	50		
Ensure that all stakeholder interests are represented in management decisions	55	55		51
Quickly adapt regulations when new scientific information becomes available	54	51	53	
Protect habitat necessary for fish spawning, breeding, feeding, and growth	54	50	54	
Maintain employment in marine-based industries	53			
Maintain the maximum sustainable yield from marine resources	53			
Protect marine biodiversity	51			
Reduce marine pollution		54	62	
Promote interagency cooperation in managing the marine environment		53	53	
Ensure that regulations are monitored and enforced			53	
Inform the public about the marine environment and how it is managed		51		

¹Unsatisfactory is defined as a survey response of “not very satisfied” or “not at all satisfied.”

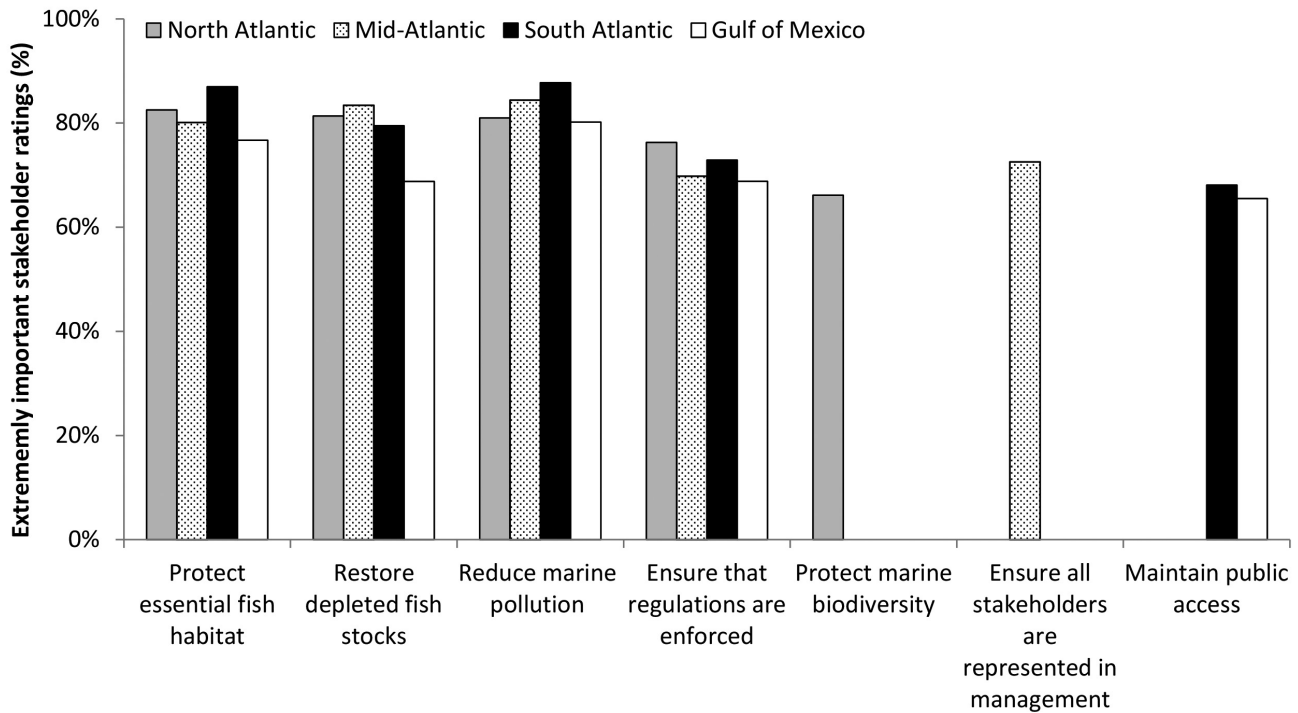


Figure 2.—Five most important management activities in each region, defined as the activities receiving the largest number of very important ratings from stakeholders.

duce non-native species introductions, 2) set aside a portion of the fishing quota as prey for marine mammals and endangered species, and 3) manage prey species so that predators have sufficient food.

What Stakeholders Want from Fisheries Management

In addition to satisfaction level, respondents were asked to rate each of the 22 management objectives as “extremely important,” “somewhat important,” “not very important,” “not important at all,” or “I am unsure” (Fig. 2). In all regions, of the top five highest-rated objectives (defined as those receiving the highest percentage of “extremely important” ratings), the top four were the same (Fig. 2). These included reducing marine pollution, protecting essential fish habitat (habitat that is essential for fish spawning, breeding, feeding, and growth), restoring depleted fish stocks, and ensuring that regulations are monitored and en-

forced. The fifth most important objectives varied by region (Fig. 2).

However, in general respondents were less than satisfied with the way management addresses these five most important objectives (Tables 3, 4). For example, in three regions, more than half of the respondents rated current management less than satisfactory when it comes to addressing the protection of essential fish habitat, reducing marine pollution, and ensuring regulations are monitored and enforced (Table 3). Restoring depleted fish stocks and reducing marine pollution was rated as important, but rated unsatisfactory when it comes to current management (Table 4).

None of management objectives were viewed by a majority of respondents as unimportant, and very few respondents were unsure of their opinion.⁷ Only three of the management

⁷The percentage of “unsure” responses ranged from 1 to 17%, but on average was very low: 5% in the North and South Atlantic regions, 6% in the Mid-Atlantic region, and 8% in the Gulf

of Mexico region. Only one management activity (allocating harvest privileges using individual fishing quotas) in one region (Gulf of Mexico) received an “unsure” rating by more than 10% of stakeholders.

The Outlook for an Ecosystem Approach to Management

Four of the management objectives rated by respondents rated as “ex-

tremely important” fit solidly within an ecosystem-based management framework as discussed in much of the scientific literature. These include protecting essential fish habitat, protecting marine biodiversity, ensuring that all stakeholder interests are represented in management decisions, and restoring depleted fish stocks. That is not to say that these objectives are not currently incorporated into management, though some, such as protecting marine biodiversity, may receive less attention under current fisheries management than they likely would warrant with an ecosystem approach (i.e. the Intergovernmental Platform on Biodiversity and Ecosystem Services was established in April 2012 as an independent intergovernmental body to lead the assessment of biodiversity, ecosystems and the essential services they provide to society).⁸ Other objectives that would likely be typical of an ecosystem approach to management were also considered “extremely important” by more than 50% of respondents, though they were not in the top five. These include minimizing bycatch, promoting interagency cooperation in management, reducing the introduction of nonnative species, undertaking research to understand relationships between different parts of the marine environment, and protecting sensitive species such as marine mammals and sea turtles.

On the other hand, some objectives that would be considered part of an ecosystem approach received ratings of “not important at all.” For example, as stated above, managing prey species so that predators have sufficient food was rated “not important at all” by about 12% of respondents in the Gulf of Mexico, and setting aside fishing quota as prey for marine mammals and endangered species was rated “not important at all” by about 15% of respondents in all regions. This finding underscores an important point, that implementing EAFM will likely involve trade-offs between conflict-

ing objectives. As an example, while over 50% of respondents in most regions said that protecting sensitive marine species was extremely important, about 15% said that setting aside fishing quota as prey for marine mammals and endangered species was “not important at all.” Though somewhat incongruous, this finding may suggest that, in pursuing a particular objective, certain types of trade-offs might be more palatable than others (e.g. protected areas or seasonal closures may be preferable to quota set-asides).

To help managers understand what types of trade-offs stakeholders would be most likely to approve, respondents were asked to evaluate six options that may be associated with an ecosystem approach, and decide whether they were “always acceptable,” “sometimes acceptable,” “rarely acceptable,” or “never acceptable.” Stakeholders could also choose the option “I am unsure” (Fig. 3, 4, 5, 6). In general, these figures suggest that some of the trade-offs that may be required under an ecosystem approach, such as decreasing quota, limiting fishing in certain areas, and limiting gear types, are moderately acceptable to respondents in all four regions, which bodes well for implementing EAFM. It is notable that some or all of these trade-offs are currently implemented, to varying degrees, in each of the four regions.

Respondents were also asked their level of agreement with statements concerning the ability of EAFM to improve fisheries management (Tables 5, 6). In all four regions, three statements received the highest percentage of “agree” responses (EAFM would improve the overall health of marine ecosystems; EAFM would improve the status of targeted fish stocks; and EAFM would increase the protection of essential fish habitat; Table 5). For these statements, close to 80% of respondents in the North Atlantic, Mid-Atlantic, and South Atlantic regions agreed; in the Gulf of Mexico region the range was 60–70%. For all other statements the range of agree responses was 35–60%.

It is worth noting that two state-

ments (EAFM would be too complex to use as a management system and EAFM would be too costly to use as a management system), both of which illustrate a potentially negative aspect of EAFM, received the highest percentage of “disagree” responses in all regions (Table 6). In general, most respondents seemed to agree that EAFM has the potential to improve fisheries management, and for all statements except the last three, statements that illustrate potentially positive aspects of EAFM, the percentage of disagreeing respondents was 9–26%.

Compared to other sections of the survey, respondents seemed more unsure of their opinions concerning the potential for EAFM. For example, for every statement, at least 10% of respondents in each region chose the response “I am unsure,” and, on average, the unsure response was 20% in the North and Mid-Atlantic regions, 17% in the South Atlantic region, and 24% in the Gulf of Mexico region. All of the above results may suggest cautious optimism toward implementing an ecosystem approach to management along the U.S. East and Gulf coasts.

Conclusion

It is fair to say that fisheries stakeholders in the North Atlantic, Mid-Atlantic, South Atlantic, and Gulf of Mexico regions have a fairly accurate knowledge of the status of fish stocks in their regions, at least those selected for this survey. Further, stakeholders are relatively satisfied with current management of those stocks, with a few exceptions. However, when it comes to more general types of management activities, stakeholders, particularly those in the North, Mid-, and South Atlantic regions, generally have a less than good opinion of management.

On the positive side, many of the objectives that stakeholders believe are extremely important are representative of EAFM, and perhaps the transition to that approach will meet with minimal to moderate resistance. Trade-offs, however, will be a key challenge

⁸For more information, see <http://www.ipbes.net/about-ipbes.html> (accessed 2 Apr. 2014).

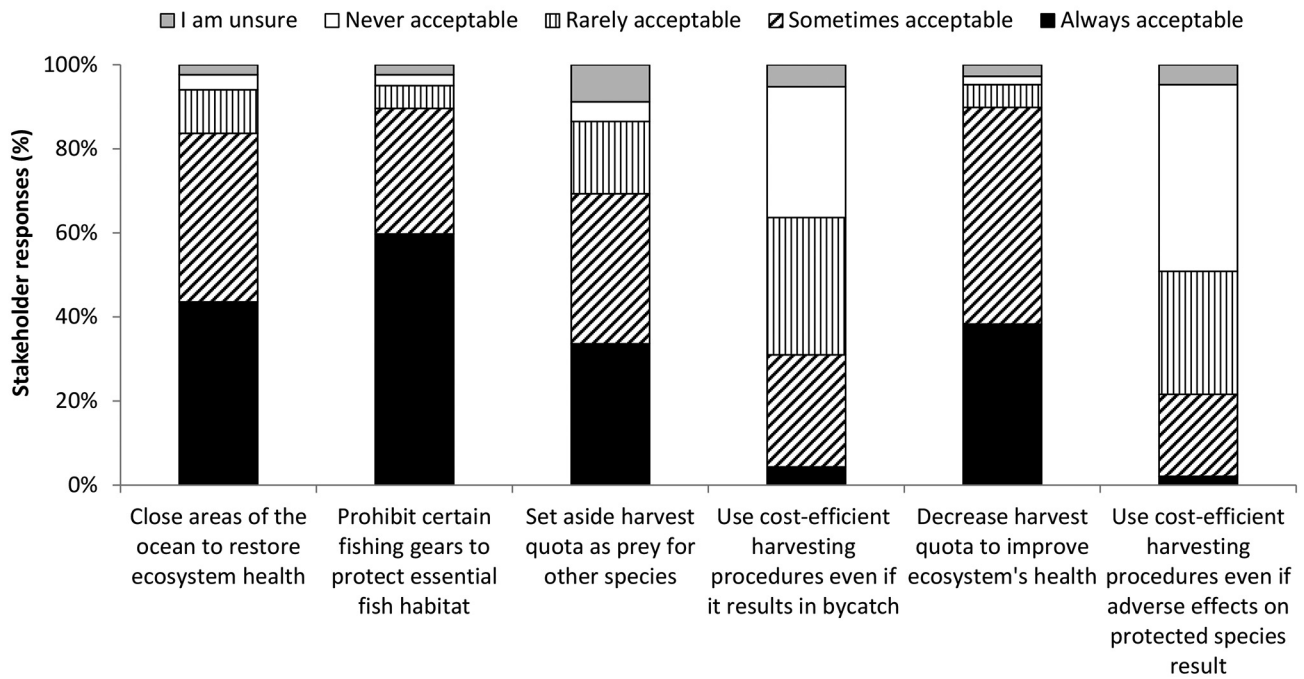


Figure 3.—Acceptable trade-offs in the North Atlantic region.

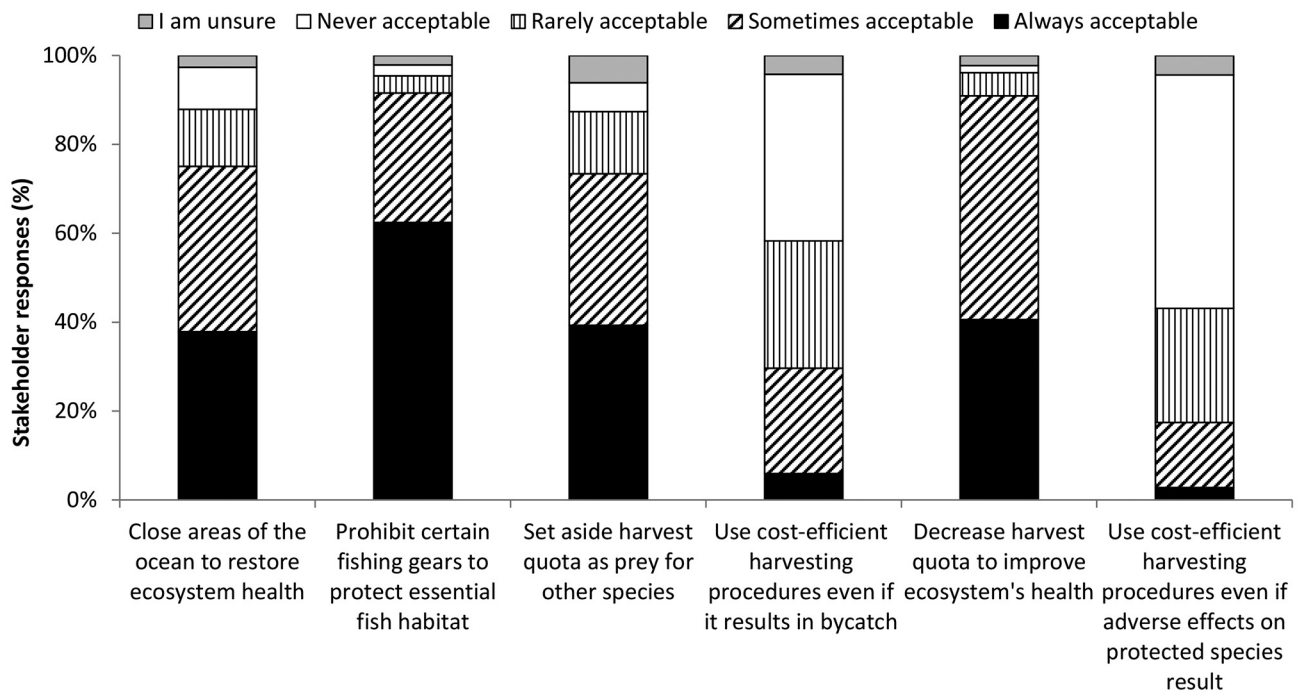


Figure 4.—Acceptable trade-offs in the Mid-Atlantic region.

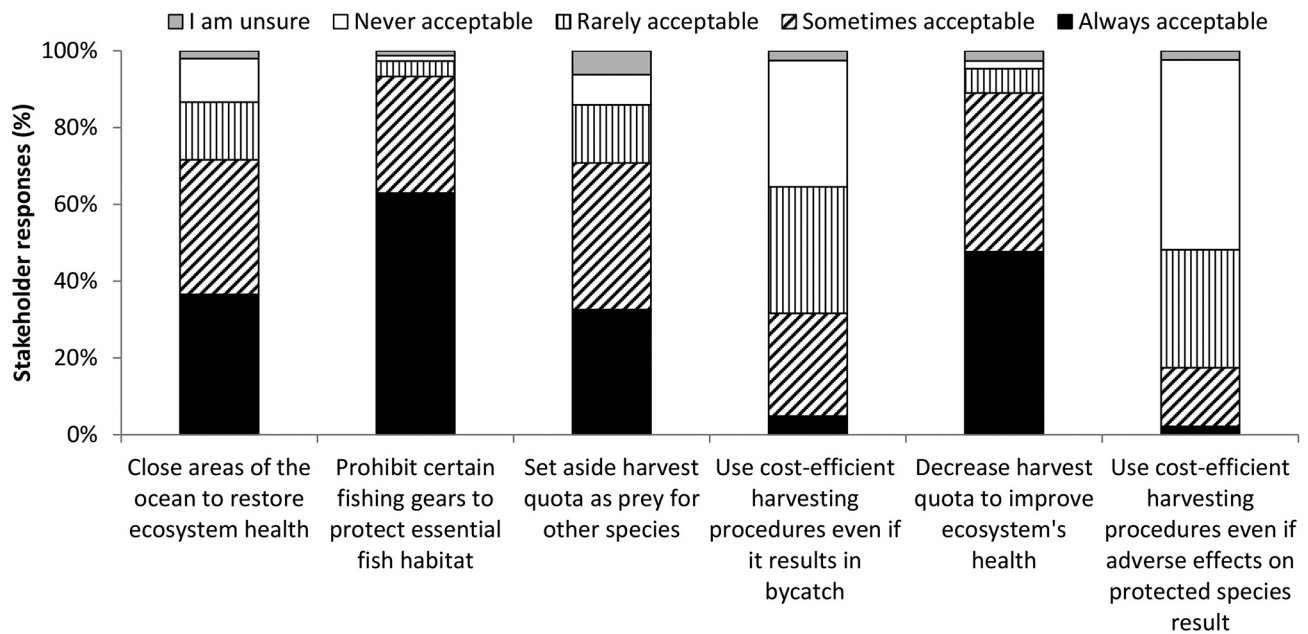


Figure 5.—Acceptable trade-offs in the South Atlantic region.

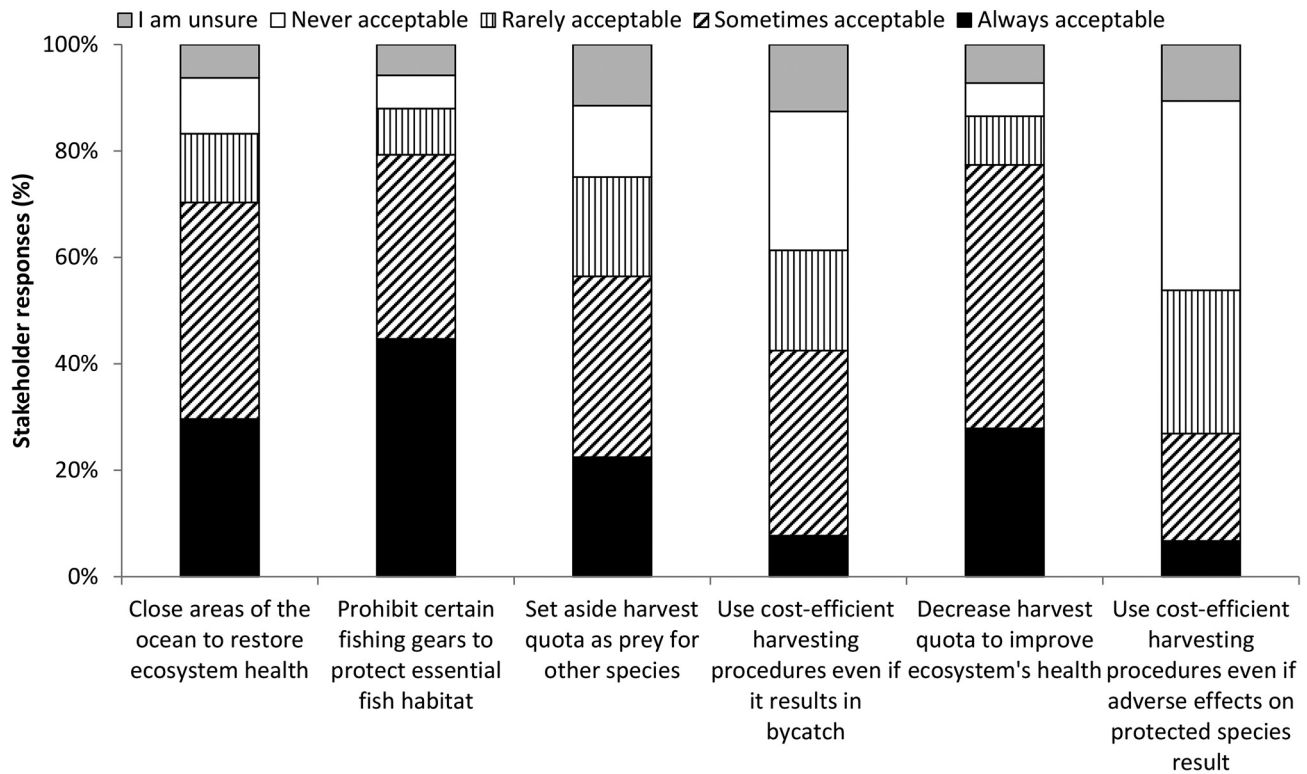


Figure 6.—Acceptable trade-offs in the Gulf of Mexico region.

Table 5.—Stakeholders who agree with certain ecosystem management principles.

Management activity	Stakeholders (%) who agreed ¹ with principle			
	North Atlantic	Mid-Atlantic	South Atlantic	Gulf of Mexico
EAM would improve the overall health of marine ecosystems	79	79	77	72
EAM would increase the overall profits in the region's fisheries	52	49	46	52
EAM would benefit fishing communities	64	64	61	55
EAM would improve the status of targeted fish stocks	75	75	71	64
EAM would increase the protection of Essential Fish Habitat	75	77	74	61
EAM would improve the status of marine mammals and sea turtles	68	69	64	60
EAM would be more representative of all types of fisheries stakeholders than the current management system	50	50	48	46
EAM would be too complex to use as a management system	40	41	42	43
EAM would be too costly to use as a management system	35	37	34	36

¹The option "I am unsure" was also available.

in EAFM implementation, and while these results suggest that stakeholders were willing to make some types of trade-offs, only a handful of trade-offs were presented in the survey. In reality, implementation may require that a much larger array of trade-offs be evaluated. That said, stakeholders' cautious optimism for EAFM, perhaps fueled by some level of dissatisfaction with current fisheries management, suggests moving forward.

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Table 6.—Stakeholders who disagree with certain ecosystem management principles.

Management activity	Stakeholders (%) who disagreed ¹ with principle			
	North Atlantic	Mid-Atlantic	South Atlantic	Gulf of Mexico
EAM would improve the overall health of marine ecosystems	9	11	12	11
EAM would increase the overall profits in the region's fisheries	27	30	31	27
EAM would benefit fishing communities	19	21	22	26
EAM would improve the status of targeted fish stocks	11	11	15	16
EAM would increase the protection of Essential Fish Habitat	10	12	12	17
EAM would improve the status of marine mammals and sea turtles	12	16	15	20
EAM would be more representative of all types of fisheries stakeholders than the current management system	28	30	30	24
EAM would be too complex to use as a management system	35	35	34	26
EAM would be too costly to use as a management system	31	34	36	28

¹The option "I am unsure" was also available.

Appendix.—NMFS mail questionnaire for fisheries stakeholders.

Ecosystem Management Survey

Help us improve fisheries management.



Sponsored by
NOAA Fisheries



Questions? Email Kristy.Wallmo@noaa.gov
This survey is voluntary.
All responses are anonymous and confidential.

OMB Control Number 0648-0523 expires 12/30/08

Section A: Interest in Fisheries Management.

NOAA's National Marine Fisheries Service is asking a sample of fisheries stakeholders about their attitudes toward Ecosystem Approaches to Fisheries Management, or EAFM. Please take a few minutes to complete the survey - we want an Ecosystem Approach to Fisheries Management to reflect the preferences of fisheries stakeholders. We would like to begin by asking you a few questions about your personal or professional interest in fisheries management. When completing the questionnaire please print clearly.

Your opinions are important!

- A1** During the past year, how many meetings of the following types have you attended:
- _____ Fishery management councils, subcommittee or advisory committees
 - _____ Environmental organizations
 - _____ Recreational fishing clubs or associations
 - _____ Commercial fishing trade organizations
 - _____ Other (please specify): _____
- A2** Do you or does anyone in your household make a living part-time or full-time from work directly associated with marine resources or the marine environment?
- Yes
 - No
 - I am unsure
- A3** Have you seen, heard, or read about fisheries management in the past 3 years?
- Yes
 - No
- A4** Have you ever altered your recreation or vacation plans because of fisheries management decisions or fisheries regulations?
- Yes
 - No
- A5** How concerned are you that fisheries management decisions will impact your life or livelihood?
- Very concerned
 - Somewhat concerned
 - Not concerned at all
 - I am unsure



Questions? email us at Kristy.Wallmo@noaa.gov

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Section B: Current Fisheries Management in the Gulf of Mexico

In this section, we would like to know what you think about the current status of some marine fish and other animals in the Gulf of Mexico region, which includes the marine waters off the coast of West Florida, Alabama, Mississippi, Louisiana, and Texas. Please answer the questions below based on your opinions and knowledge of the Mid-Atlantic region.

- B1** In your opinion, current management of this species is...
- | | Excellent | Good | Fair | Poor | I am unsure |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Bottlenose Dolphin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sea Turtles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- B2** In your opinion, the status of this species is....
- | | Stable | Threatened or endangered but recovering | Threatened or endangered not recovering | I am unsure |
|--------------------|--------------------------|---|---|--------------------------|
| Bottlenose Dolphin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sea Turtles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- B3** In your opinion, current management of this species is...
- | | Excellent | Good | Fair | Poor | I am unsure |
|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Red Drum | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Spiny Lobster | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Snappers/Groupers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mackerels | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Shrimp | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- B4** In your opinion, the status of this species is...

	Stable	Overfished but recovering	Overfished, not recovering	I am unsure
Red Drum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spiny Lobster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snappers/Groupers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mackerels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shrimp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions? call Kristy Wallmo at 1.301.713.2328



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Questions? email us at Kristy.Wallmo@noaa.gov

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Section C: Your Preferences for Fisheries Management

A number of objectives can be considered when fisheries management strategies are developed for the Gulf of Mexico region, and, in some cases, objectives will be conflicting. Because not all objectives can be given equal attention, it is important for managers to understand which objectives are important to you.

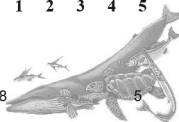
C1 Listed below are a number of potential objectives for managing the Gulf of Mexico region. Using the scales, please circle your opinion about:

- The importance of each objective for the Gulf of Mexico region
- The satisfaction level you have with the way current management addresses each objective in the Gulf of Mexico region

Importance	Satisfaction
1=Extremely Important	1=Extremely Satisfied
2=Somewhat Important	2=Somewhat Satisfied
3=Not Very Important	3=Not Very Satisfied
4=Not Important at All	4=Not Satisfied at All
5=I Am Unsure	5=I Am Unsure

(a) Ensure that all stakeholder interests are represented in management decisions	1 2 3 4 5	1 2 3 4 5
(b) Maintain employment from marine-based industries	1 2 3 4 5	1 2 3 4 5
(c) Protect marine biodiversity	1 2 3 4 5	1 2 3 4 5
(d) Restore fish stocks that have been depleted	1 2 3 4 5	1 2 3 4 5
(e) Reduce pollution in the marine environment	1 2 3 4 5	1 2 3 4 5
(f) Protect sensitive species such as marine mammals and sea turtles	1 2 3 4 5	1 2 3 4 5
(g) Minimize any adverse economic impacts to stakeholders	1 2 3 4 5	1 2 3 4 5
(h) Protect Essential Fish Habitat - habitat that is necessary for fish spawning, breeding, feeding, and growth	1 2 3 4 5	1 2 3 4 5

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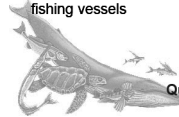


C1 Continued...

Importance	Satisfaction
1=Extremely Important	1=Extremely Satisfied
2=Somewhat Important	2=Somewhat Satisfied
3=Not Very Important	3=Not Very Satisfied
4=Not Important at All	4=Not Satisfied at All
5=I Am Unsure	5=I Am Unsure

(i) Minimize bycatch	1 2 3 4 5	1 2 3 4 5
(j) Maintain public access to the marine environment	1 2 3 4 5	1 2 3 4 5
(k) Set aside a portion of the fishing quota for marine mammals and endangered species to eat	1 2 3 4 5	1 2 3 4 5
(l) Undertake research to understand the relationships among different parts of the marine environment	1 2 3 4 5	1 2 3 4 5
(m) Promote interagency cooperation in managing the marine environment	1 2 3 4 5	1 2 3 4 5
(n) Maintain the maximum sustainable yield from marine resources	1 2 3 4 5	1 2 3 4 5
(o) Reduce non-native species introductions	1 2 3 4 5	1 2 3 4 5
(p) Quickly adapt regulations when new scientific information becomes available	1 2 3 4 5	1 2 3 4 5
(q) Undertake activities to inform the public about the marine environment and how it is managed	1 2 3 4 5	1 2 3 4 5
(r) Allocate harvest privileges to fishermen using Individual Fishing Quotas	1 2 3 4 5	1 2 3 4 5
(s) Manage prey species so that predators have sufficient food	1 2 3 4 5	1 2 3 4 5
(t) Maintain fishing-dependent communities	1 2 3 4 5	1 2 3 4 5
(u) Ensure that regulations are monitored and enforced	1 2 3 4 5	1 2 3 4 5
(v) Reduce the total number of fishing vessels	1 2 3 4 5	1 2 3 4 5

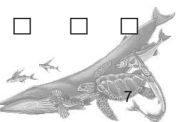
Questions? email us at Kristy.Wallmo@noaa.gov



C2 For the next set of questions, we would like you to read each statement below and place a check in the one box that most closely represents your opinion:

	Always	Sometimes	Rarely	Never	I am unsure
(a) It is acceptable to decrease fish harvest quotas in order to improve the overall health of the marine environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) It is acceptable to preserve marine-based employment opportunities even if doing so decreases the overall profits from marine-based industries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) It is acceptable to set aside some of the harvest quota in order to maintain a food source for higher level fish and mammals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) It is acceptable to use cost-efficient harvesting procedures even if doing so results in the bycatch of non-targeted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) It is acceptable to use cost-efficient harvesting procedures even if doing has adverse effects on protected marine species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) It is acceptable to allocate harvest privileges such as Individual Fishing Quotas even if doing so has adverse social effects on fishing communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) It is acceptable to discard harvested fish due to regulatory restrictions, even when those fish may be marketable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) It is acceptable to prohibit certain types of fishing gear in order to protect essential fish habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) It is acceptable to close areas of the ocean to fishing in order to restore ecosystem health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) It is acceptable to discard harvested fish if they do not have a market value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions? call Kristy Wallmo at 1.301.713.2328



Section D: Ecosystem Approaches to Fisheries Management

In this section, we would like to ask you about your opinions of an Ecosystem Approach to Fisheries Management, or EAFM.

An ecosystem is a geographically specified system of organisms, including humans, and the processes that shape the system. Most scientists agree that an Ecosystem Approach to Fisheries management would consider the following elements:

- Extension of the single-species approach of current fisheries management to also consider ecological relationships such as predation, competition, and habitat.
- Consideration of the overall quality of the marine ecosystem.
- Consideration of humans as part of the ecosystem.
- Promotion of integrated, regional management of marine ecosystems with all relevant authorities and stakeholders.
- Use of the precautionary approach, e.g. make conservative decisions when information is uncertain or incomplete.
- Initiate activities to increase the knowledge base available for decision-making.
- Try to balance diverse societal objectives.

D1 For the next set of questions, we would like you to read each statement below and please check the box corresponding to your level of agreement with that statement:

In the Gulf of Mexico region EAFM...

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	I am unsure
...would improve the overall health of marine ecosystems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would increase the overall profits in the region's fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would benefit fishing communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would improve the status of targeted fish stocks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions? email us at Kristy.Wallmo@noaa.gov



Section E: About You and Your Household

In this last section, we would like to ask you a few questions about yourself.

E1 In general, how important are each of the following reasons for choosing to visit or live in a coastal community?

	Very Important	Somewhat Important	Not Very Important	Not Important at All
Visit family and friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visit a natural area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreational fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
View marine animals (such as whales, sea turtles, manatees, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snorkeling or diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Birding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hunting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buy fresh local seafood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enjoy being around a working commercial fishing marina/dock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other reasons (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E2 During the past year, how many days have you spent:

- _____ Recreational fishing in freshwater
- _____ Recreational fishing in saltwater
- _____ Collecting shellfish or other marine resources for personal consumption
- _____ Participating in marine-based recreation such as visiting a beach, boating, sightseeing, snorkeling, scuba diving, whale watching, etc.
- _____ Commercial fishing in saltwater
- _____ Providing marine recreational services for hire (charter or headboat fishing, whale watching, sightseeing, etc.)

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E7 Which of the following categories best describes your household's total annual income before taxes in 2005?

<input type="checkbox"/> Less than \$10,000	<input type="checkbox"/> \$50,000 - \$74,999
<input type="checkbox"/> \$10,000 - \$14,999	<input type="checkbox"/> \$75,000 - \$99,999
<input type="checkbox"/> \$15,000 - \$24,999	<input type="checkbox"/> \$100,000 - \$149,999
<input type="checkbox"/> \$25,000 - \$34,999	<input type="checkbox"/> \$150,000 - \$199,999
<input type="checkbox"/> \$35,000 - \$49,999	<input type="checkbox"/> \$200,000 or more

E8 What is your ethnic background?

Hispanic or Latino Not Hispanic or Latino

E9 What is your race (please mark all that apply)?

White American Indian or Alaska Native
 Black/African American Native Hawaiian or Other Pacific Islander
 Asian

E10 What year were you born?
 Year: _____

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E3 How much do you trust each of the following to manage marine resources? Please check the box that most closely represents your opinion:

	Trust completely	Trust somewhat	Distrust somewhat	Don't trust at all	I am unsure
Federal agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local governments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scientists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independent boards made up of local interests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independent boards with business and environmental interests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E4 What is the highest level of education you have completed?

Less than 9th grade Some college (no degree)
 Some high school (no diploma) College graduate (bachelor degree)
 High school graduate (including GED) Advanced, Professional, or doctoral degree
 Associates degree or technical school

E5 Are you.....?

Male Female

E6 What best describes your employment status? Please check all that apply.

Employed full-time Student (part-time)
 Employed part-time Student (full-time)
 Full time homemaker Unemployed
 Retired Other (specify) _____

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D2 For the next set of questions, we would like you to read each statement below and please check the box corresponding to your level of agreement with that statement:

In the Gulf of Mexico region EAFM...


	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	I am unsure
...would increase the protection of Essential Fish Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would improve the status of marine mammals and sea turtles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would be more representative of all types of fisheries stakeholders than the current management system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would be too complex to use as a management system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...would be too costly to use as a management system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Marine managers are increasingly adopting an Ecosystem Approach to Fisheries Management, though there is still discussion about the concept itself and how it should be implemented. Please use the space below to tell us any thoughts or opinions that you have about an EAFM.


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 **E11** Do you consider yourself to be...? Please check all that apply.

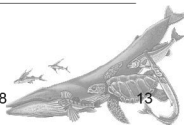
- Commercial fisherman
- Recreational fisherman
- Concerned Citizen
- Member of an environmental organization
- Member of a fisheries trade organization
- Fishery manager
- Fishery researcher
- Academic (teacher, researcher)
- Government agency personnel
- Other (specify) _____

 **E12** How do you usually get information about fishing and other marine related activities and issues? Please check all that apply.

- Television
- Radio
- Newspapers
- Fishing websites
- Magazines
- Clubs/associations
- Email from friends
- Email from organizations
- Government announcements
- Other (specify) _____

 **E13** What local coastal or marine issues are important to you?

Questions? call Kristy Wallmo at 1.301.713.2328



Thank You for Participating!

Please use the space below to make any additional comments you may have. If you have any questions regarding the survey, please call 1.301.713.2328 or email Kristy.Wallmo@noaa.gov

PAPERWORK REDUCTION ACT STATEMENT: Collection of information through mail surveys provides data on preferences for fishery management goals and objectives from a diverse group of fisheries stakeholders. This information aids NOAA Fisheries in developing and analyzing an array of fishery management guidelines and policies. Public reporting burden is estimated to average 20 minutes per response. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to: NOAA Fisheries, Ft. 175, 1305 East West Highway, Silver Spring, MD 20910.

Providing the requested information is voluntary. In accordance with NOAA Administrative Order 216-100, "Confidentiality of Fishery Statistics", any information submitted to NOAA Fisheries by any person in response to this survey shall be considered confidential and shall not be disclosed except to: (1) Federal employees and coastal employees who are responsible for fishery management plan development and monitoring; (2) state employees pursuant to an agreement with the Secretary of Commerce that prevents public disclosure of this information; or (3) when required by court order. Notwithstanding any other provision of the law, no person is required to respond to, or shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number. This is an approved information collection under OMB#0648-0022.



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