
Improving the Scientific Basis for Management by Separating Conservation and Management Decisions

Lee Crockett

Introduction

Scientists nationwide have repeatedly warned that continued overfishing on already-depleted fish stocks increases the risk of a severe and prolonged population collapse.¹ Nevertheless, many regional fishery management councils continue to ignore scientific evidence and develop management plans that fail to end overfishing and do not rebuild depleted fish stocks in a timely way. Progress towards ending overfishing, rebuilding depleted fish stocks and ensuring the long-term sustainability of our nation's fish populations has been limited due to this failure to recognize the primacy of science and separate scientific determinations from allocation decisions. The need to separate science (i.e. conservation) from allocation decisions within the fishery management councils has been endorsed by groups as diverse as the National Academy of Science and the U.S. Commission on Ocean Policy.

History of an Idea

For nearly three decades fishery managers have struggled to develop fishery management plans that conform to conservation objectives and the legal standards of the Magnuson-Stevens Fishery Conservation and Management Act. Faced with intense political pressure to relieve the near term economic burden imposed by more stringent regulatory restrictions, the regional fishery management councils have too often ignored scientific advice concerning the status of fish populations, sustainable catch levels and habitats in need of protection. Not surprisingly, the result has been nationwide declines in fish populations and habitat deterioration. To address these problems, a series of independent studies have been conducted over the past two decades. The conclusions were consistent and clear: it is critical that we strengthen the scientific basis of fisheries management by separating scientific determinations from allocation decisions.

The NMFS-sponsored "Calio Report," published in 1986, concluded that "[f]ishery management will be markedly improved by a clear separation between conservation and allocation decisions." The Report also recommended that NOAA determine the allowable biological catch (ABC) using the best available science and local and regional expertise while the regional fishery management councils make the allocations which could not exceed the ABC. In 2002, the National Research Council published the results of a similar study entitled "Science and Its Role in the National Marine Fisheries Service." The report criticized the existing system and called for a review of the fisheries governance system and the use of science. It specifically noted that the use of science in marine fisheries management decision-making is impeded by the governance system created by the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Another study conducted by the Stanford University Fisheries Policy Project and published in 2003 recommended that science alone should dictate catch levels while the councils should be tasked with allocating the catch. The Pew Oceans Commission report, also published in 2003, echoed this conclusion concerning the need to separate scientific determinations from allocation decisions.

In 2004, the U.S. Commission on Ocean Policy (USCOP) released its report, which paralleled many of the conclusions and recommendations of the Pew Oceans Commission. Significantly, recommendations from

¹ See "Improving the Use of the 'Best Scientific Information Available' Standard in Fisheries Management," National Research Council (2004) at 21 (stating that it is "important to avoid population levels that are so low that they substantially increase the probability of collapse of the fish stock.").

both Commissions flow from recognition that major fishery problems are related to governance, not inadequate science.

The most important of these recommendations include: (1) separating decisions regarding how many fish can be taken from the ocean ("assessment decisions") from decisions about allocation of the available catch and other operational issues ("allocation decisions"); and (2) requiring regional fishery management councils to set harvest limits at or below the limits recommended by independent scientists. The intent of these recommendations is to strengthen the role of science in fisheries management decisions and insulate scientific advice from political manipulation by improving the independence of the councils' Science and Statistical Committees (SSCs).

Examples Demonstrating the Need to Strengthen Scientific Basis for Fisheries Management

Pacific Rockfish

Pacific bocaccio rockfish, once the dominant groundfish caught off California, have been fished down to about 7.5% of their historic abundance. So severe is the decline that scientists estimate that the current population is less than the total amount of Pacific rockfish caught by fishermen in 1974. This precipitous decline is due in large part to over two decades of persistent overfishing. Pacific bocaccio rockfish are long-lived and slow-to-reproduce making them particularly vulnerable to overfishing. Both independent scientists and NMFS scientists repeatedly warned fishery managers that fishing levels on Pacific rockfish were too high, but the Pacific Fishery Management Council (PFMC) consistently ignored scientific advice. As early as 1984, Dr. Robert Francis, a NMFS scientist, explained that “[g]roundfish species currently requiring management attention along the west coast have life history patterns that encourage overexploitation. These resources have such low rates of production and (relatively) high unexploited standing stocks that fisheries can develop and mature relying almost entirely on the standing stock (as opposed to new or surplus production) for their sustenance. These resources are ultimately harvested down to levels at which their fisheries productive capacities are destroyed.”²

Warnings that catch rates were too high or that Pacific bocaccio rockfish biomass was too low were issued almost annually between 1988 and 1998 and the species was formally declared overfished and in need of rebuilding in 1999.³ The Council, in response to fishing industry claims that stronger restrictions would create unnecessary economic hardship, rejected these warnings. Finally, in 2000, the Secretary of Commerce declared the entire Pacific groundfish fishery a disaster. Following a 2002 stock assessment, the Council was forced to close thousands of square miles of Pacific waters to bottom fishing to allow Pacific rockfish a chance to recover.⁴ Currently, eight species of Pacific groundfish (of twenty-two assessed out of 83 managed) are listed as overfished. The Council continued to permit overfishing on one of those species, lingcod, in 2002 and 2003. Figure 1 illustrates the result of this management failure.

² “Fisheries Research and its Application to West Coast Groundfish Management.” Robert C. Francis, NMFS. In: Fisheries Management: Issues and Options, University of Alaska Sea Grant Report 85-2.

³ Status of bocaccio off California in 2002.” Alec D. MacCall, NMFS. Available from the Pacific Fishery Management Council: www.pcouncil.org/groundfish/gfstocks/bocaccio06_02.pdf.

⁴ In the fall of 2004, the closed areas totaled 10,800 square miles. Personal communication with Dr. Jim Hastie, Northwest Fishery Science Center, 3-01-05.

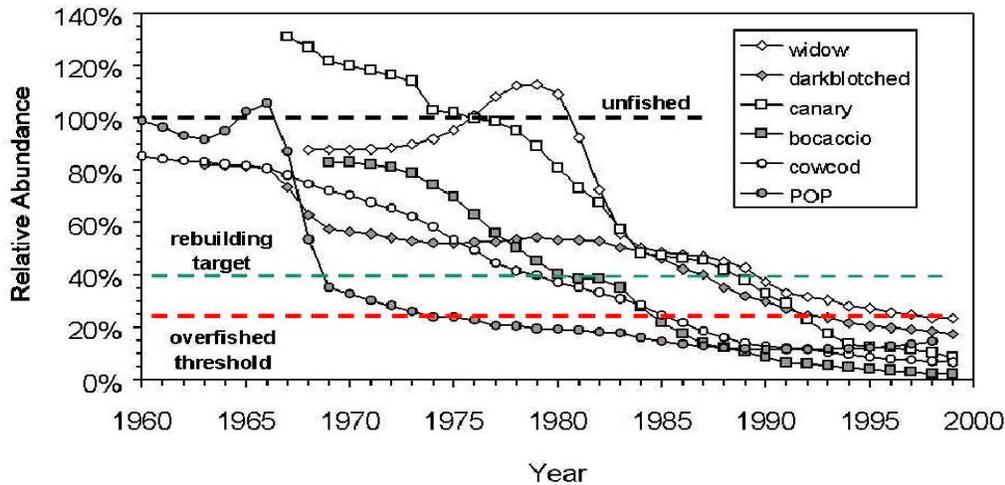


Figure 1. Relative abundance of Pacific groundfish stocks over time.

Gulf of Mexico Red Snapper

The status of red snapper in the Gulf of Mexico was first formally assessed in the late 1980's. At that time, scientists found red snapper to be “significantly overfished” and recommended substantial reductions in fishing mortality (i.e., 60-70%) to allow depleted populations to rebuild. In response, the Gulf Council established a total allowable catch (TAC) limit of 6 million pounds for the fishery and allocated 51% of the TAC for the commercial fishery and 49% of the TAC for the recreational fishery. It also set a target rebuilding date of 2000, but rather than collecting actual landings data, the Council relied on size and bag limits to control mortality levels in the recreational fishery. These management measures did little to reduce actual mortality and the recreational portion of the TAC was exceeded year after year. In 1990, a subsequent stock assessment confirmed that the fishery was in trouble and that existing management measures were not sufficient to reduce red snapper mortality to the scientifically recommended levels.

The Council responded by reducing the TAC, extending the rebuilding period to 2007 and concentrating its efforts on reducing red snapper bycatch mortality within the Gulf shrimp fishery. Although the stocks were not improving, in the years to follow the Council voted to increase the TAC from 4 to 6 to 9.12 million pounds and to extend the rebuilding period from 2007 to 2009 to 2019 to 2032. (See Figure 2) For the past eight years, the Council has set the TAC at 9.12 million pounds, at least 3 million pounds (or 32.8%) higher than the catch level recommended by scientists.

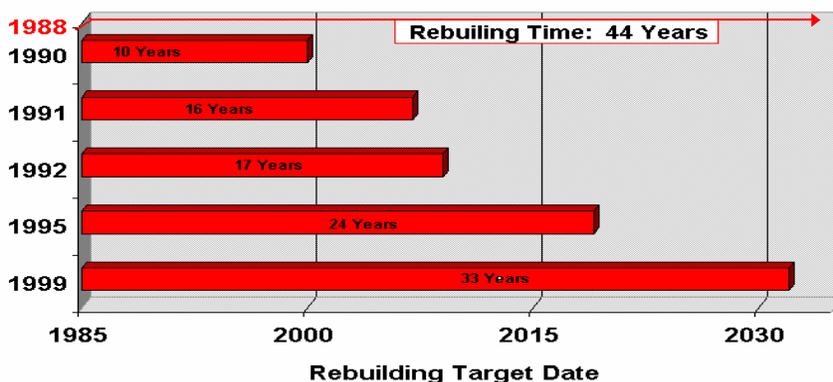


Figure 2. Extension of Gulf red snapper target rebuilding date.

In every report to Congress red snapper has been listed as overfished and subject to overfishing. Still, there is no rebuilding plan in place that is consistent with the requirements of the law as amended by the Sustainable Fisheries Act in 1996. In fact, the last two rebuilding plans developed by the Council were rejected by NMFS for failure to comply with the law. NMFS commented that one of the more recent proposals was simply designed to delay new management measures until new stock assessments were completed in 2005.

Instead of lowering catch limits, limiting directed fishing mortality and rebuilding red snapper populations as quickly as possible, the Gulf Council has focused the bulk of its management efforts on minimizing red snapper bycatch with the Gulf shrimp fishery. What's more, the Council has consistently relied on a suite of largely ineffective indirect controls to reduce red snapper mortality. Specifically, the Council has managed red snapper stocks using a combination of gear restrictions, minimum size limits and bycatch reduction devices (BRDs). In 1998, the Council reserved 3.12 million lbs of the 9.12 million lb red snapper TAC pending proof that the experimental bycatch reduction devices (BRDs) were at least 60% effective. The BRDs were only 24% effective, but Council released the remaining TAC anyway.

Perhaps the most astonishing management tactic to date is the Council's recent approval of a rebuilding plan ("Reef Fish Amendment 22") for red snapper that relies on an additional 50% of the commercial shrimpers in the Gulf going out-of-business rather than taking any directed management action to recover the red snapper population. The Council believes that the decline in the shrimp industry, and associated reduction in red snapper bycatch, will be sufficient to bring about the recovery of red snapper.

Today, almost two decades after the initial discovery that red snapper were severely depleted and almost a decade after the passage of the Sustainable Fisheries Act requiring rebuilding plans for all overfished species, red snapper is still being overfished and lacks an adequate rebuilding plan. As is the case in many regions, political pressure and economic concerns too often outweigh sound science in fisheries management decisions in the Gulf of Mexico.

New England Groundfish

Throughout the 1980s scientists warned the New England Fishery Management Council (NEFMC) that groundfish were being overfished and recommended immediate reductions in fishing pressure. The Council however continued to allow fishing at unsustainably high rates, which resulted in catch levels that routinely exceeded target levels. By the mid-1990s, the Council's failure to make the necessary cuts to end overfishing and rebuild New England's severely depleted groundfish stocks led to the collapse of several key groundfish populations including Georges Bank haddock and Southern New England yellowtail flounder. By 1994, 80% of adult cod were caught by fishermen and Georges Bank cod was in danger of "imminent collapse." Since then, Georges Bank haddock, redfish and Georges Bank yellowtail flounder have made modest recoveries while Southern New England yellowtail flounder stocks have shown virtually no signs of recovery since the early 1990s. Currently, twelve of the twenty managed groundfish stocks are classified as overfished and eight of the twenty are subject to overfishing. Meanwhile, seven species are designated as overfished *and* experiencing overfishing.⁵

The New England Council typically uses a bar graph showing overall groundfish biomass over time to claim that significant progress is being made in rebuilding depleted groundfish populations in the region. Examining the relative progress of different New England groundfish species under the current management regime by separating those populations still subject to overfishing from those that are not currently experiencing overfishing leads to a different conclusion. For four of the twelve overfished groundfish

⁵ See Northeast Fisheries Science Center, *Assessment of 20 Northeast Groundfish Stocks Through 2001: A Report of the Groundfish Assessment Review Meeting* (2002) at 14 (Supp. AR Doc. SPP43).

populations, where the Council set and followed science-based catch limits, the stocks are indeed recovering. (See Figure 3) For the other eight overfished groundfish species however, the Council has failed to adhere to scientifically based limits and those populations are slow to rebuild and remain well below healthy population levels. (See Figure 4)

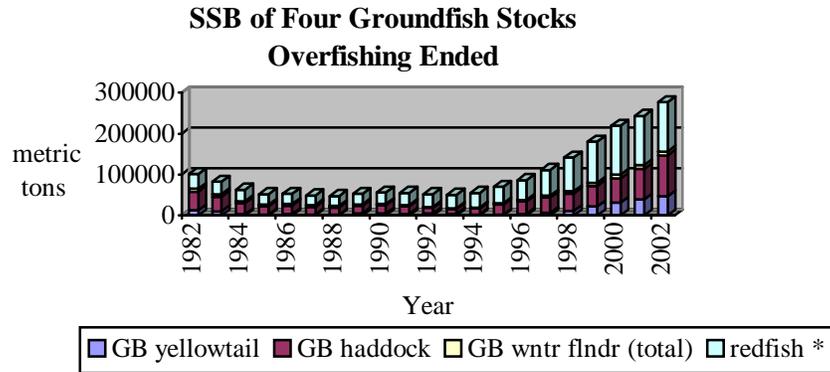


Figure 3. Sustainable stock biomass over time for four New England groundfish populations upon which overfishing has ended. Source: 1982-2001 GARM Report, 2002 NEFSC biomass projections, redfish and white hake from SAW 33.

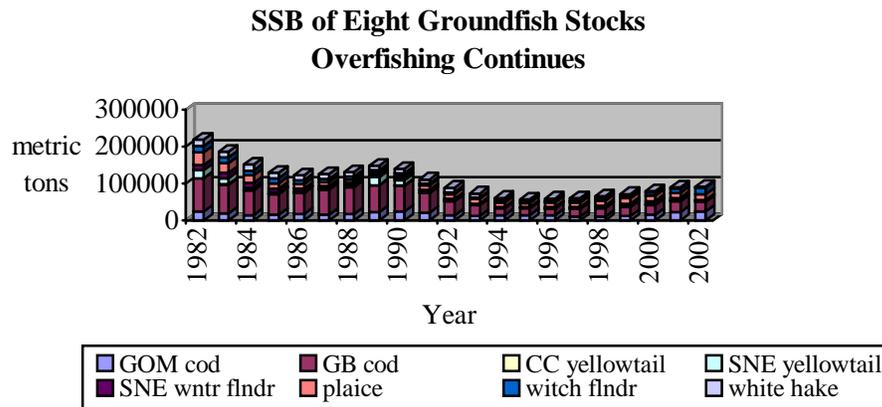


Figure 4. Sustainable stock biomass over time for eight New England groundfish populations upon which overfishing continues. Source: 1982-2001 GARM Report, 2002 NEFSC biomass projections, redfish and white hake from SAW 33.

New England is perhaps the most well studied region with regards to fisheries data collection, yet despite ample scientific evidence showing that groundfish stocks are severely overfished and not rebuilding, the New England Council continues to base its management decisions on economic and political considerations rather than sound science. Indeed, the NEFMC is notorious for ignoring scientific advice, and the deterioration of groundfish populations is testament to this pattern of delay and denial. In 2001, a federal court judge declared that the fishery management plan for New England groundfish violated the law because it: (1) explicitly allowed continued overfishing, (2) relied on management measures that were likely to fail, and (3) lacked an adequate plan to monitor and assess bycatch.⁶ Today, more than three years after the initial ruling,

⁶ *Conservation Law Foundation v. Evans*, 209 F Supp. 2d 1, 9-10, 13 (D.D.C. 2001).

the amended groundfish management plan (“Amendment 13”) is still not consistent with scientific recommendations and fails to comply with statutory requirements and a federal court order.

Amendment 13 fails to prevent overfishing and relies upon a suite of indirect management measures that are unlikely to limit fishing mortality to the target level. Indeed, Amendment 13’s “phased mortality” approach allows overfishing to continue on five groundfish species including Georges Bank cod. This, in spite of the fact that Georges Bank cod populations, which have shown virtually no improvement in more than a decade, currently hover at about 14% of the healthy population level.⁷ Persistent overfishing has contributed to low stock recruitment and has caused the population of Georges Bank cod to fall from more than 23 million fish in 1999 to less than 11 million fish in 2002.⁸ In 2002, the actual catch of Georges Bank cod was greater than 17,514,000 lbs and exceeded the scientifically recommended target catch level of 5,694,000 lbs by more than three times.⁹ In the same year, the actual fishing rate on Georges Bank cod was more than twice the target fishing rate established by NMFS scientists for that year. Nevertheless, the Council’s amended plan authorizes fishing rates on Georges Bank cod that will result in fishing mortality ($F = 0.21$) in excess of the maximum fishing mortality threshold (F_{msy}) ($F = 0.18$) recommended by scientists.

Year after year, cod landings in New England have exceeded target catch levels by 100-300%.¹⁰ This failure is attributable to the Council’s approval of fishing rates in excess of scientific recommendations and its continued reliance on non-binding target catch levels. The management measures developed by the Council provide no backstop or accountability mechanism to ensure that the target TAC is not exceeded. Rather, the Council relies on ineffective effort controls to reduce groundfish mortality. In 2002, the Council reduced the number of days-at-sea (DAS) fishermen were allowed to fish by nearly 40%, but Georges Bank cod catch actually went up by more than 15%. Despite the negative correlation between DAS cuts and actual mortality reductions, the Council opted, once again, to cut DAS by another 15-20% in Amendment 13. Cod mortality needs to decrease substantially (from 2002 levels), but there is no evidence to explain how additional DAS cuts will meet the target goals.

**Target Catch vs. Landings
Gulf of Maine and Georges Bank Cod
1996-2002**

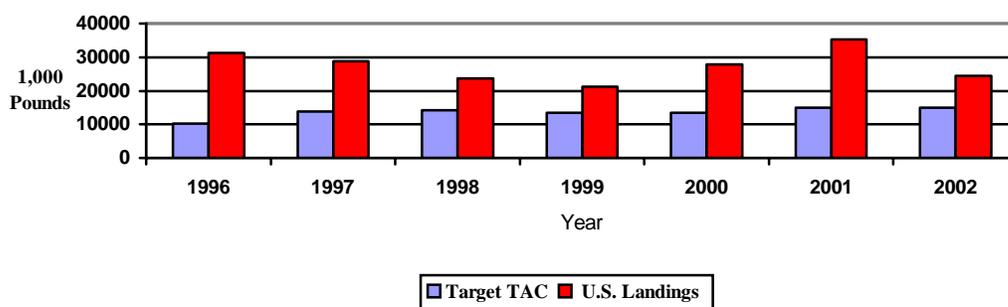


Figure 5. Target catch vs. actual landings of Gulf of Maine and Georges Bank cod from 1996-2002.

⁷ Northeast Fisheries Science Center, *Assessment of 20 Northeast Groundfish Stocks Through 2001: A Report of the Groundfish Assessment Review Meeting* (2002) at 14.

⁸ Northeast Fisheries Science Center, *Assessment of 20 Northeast Groundfish Stocks Through 2001: A Report of the Groundfish Assessment Review Meeting* (2002) at 26, Table A7.

⁹ See Table 1.A, <http://www.nero.noaa.gov/ro/fso/fy02-03.pdf>.

¹⁰ See <http://www.nero.noaa.gov/ro/fso/mul.htm>.

North Pacific

Unlike most other councils, the North Pacific Fishery Management Council (NPFMC) in recent years has adopted a pro-active and precautionary approach to fisheries management. The NPFMC relies on science-based catch limits to set the TACs for individual fisheries, and has never set a TAC at a level greater than the scientifically based recommendation for ABC. While there is still some debate regarding what constitutes a sufficiently conservative ABC, the effect of this management approach is that none of the North Pacific finfish populations are currently classified as overfished. For example, in 2005, the Council set the TAC for Bering Sea sablefish equal to the scientifically recommended ABC of 2.4 thousand metric tons (mt). Similarly, the Council followed scientific advice and did not exceed the ABC when setting the TAC for the Gulf of Alaska pollock fishery at 71.2 thousand mt.

The Council's success is due in large part to its precautionary approach to management. The NPFMC employs a tiered system, which is designed to apply greater caution to species for which there is less scientific data and information. An example of the North Pacific Council's precautionary approach to management is its recent decision to limit the footprint of the bottom trawl fisheries in the Aleutian Islands. Scientists have observed via submersibles biologically diverse coral and sponge habitats throughout the island chain, yet very little is known about their precise distribution. Responding to the recommendations of scientists and independent peer reviewers, the council voted to protect over 60% of the fishable area as a precautionary measure and to prevent bottom trawling from spreading into new sensitive areas.

U.S. Commission on Ocean Policy Recommendations

After three years of intense investigation into the health of our oceans, the U.S. Commission on Ocean Policy released its final report on September 20, 2004. The Commission concluded that "Our failure to properly manage the human activities that affect the nation's oceans, coasts, and Great Lakes is compromising their ecological integrity, diminishing our ability to fully realize their potential, costing us jobs and revenue, threatening human health, and putting our future at risk." The Commission went on to say that, "The message from both experts and the public alike was clear: our oceans, coasts, and Great Lakes are in trouble and major changes are urgently needed in the way we manage them."

Among the recommendations were a series of measures designed to enhance fisheries science and management to ensure the long-term sustainability of marine fish and ocean ecosystems. Specifically, the USCOP report recommended amending the Magnuson-Stevens Act to strengthen the role of the Council's Science and Statistical Committee's (SSCs) and require the Councils to conform their management decisions to the scientific determinations made by their SSCs. The role of the SSCs, the report explained, should be to determine the allowable biological catch (ABC) and councils should be bound to those determinations. The report also recommended that the Secretary to provide for an independent review process of the scientific information relied on by the SSCs.

Required by law to respond to the recommendations put forth by the Commission, the Bush Administration missed a critical opportunity to reform the federal fisheries management when it announced no new major initiatives to address some of the issues highlighted by the Commission. Instead, the Bush Administration acknowledged several existing policies citing advances in areas such as salmon recovery and rebuilding fish stocks. Meanwhile, the Administration recently rolled back protection for 90 percent of the critical habitat for endangered West Coast salmon and only 10 percent of all fish stocks managed by the federal government have been fully assessed by scientists and determined to be healthy. Admiral James D. Watkins, chairman of the U.S. Commission on Ocean Policy, commented that "President Bush talks of the need for fundamental change in core government operations and organizations when he speaks of the tax code, social security, and homeland security. Equally dramatic changes are needed in ocean and coastal management. The systems we currently have were created for yesterday, not for tomorrow."

Fisheries Science and Management Enhancement Act of 2005

While the Bush administration's response to the USCOP report was lackluster at best, Congress has heeded the call and is currently in the process of developing legislation to address some of the most pivotal recommendations made by the USCOP. The Fisheries Science and Management Enhancement Act of 2005, which will be introduced by Congressman Rahall (D-WV) and others in March 2005, seeks to implement several key USCOP recommendations. Building on the strengths of the existing management process, the bill amends the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to: (1) broaden stakeholder representation on fishery management councils; (2) significantly reduce financial conflicts of interest among Council members; (3) provide training for new Council members; (4) develop cooperative research, data collection and gear modification programs; and (5) enhance the use of science in fishery management decisions.

The bill strengthens the role of science in the fishery management process by insulating scientific determinations from political and economic pressures. It requires that each Council's Science and Statistical Committee (SSC) - whose role it is to help develop, collect, and evaluate the statistical, scientific, economic, and social information necessary to generate fishery management plans - include a fishery and marine science subcommittee. The subcommittee, drawn from those members of the SSC who have scientific expertise in fishery biological science or marine ecology, is responsible for making scientific determinations that include biological catch and bycatch limits, habitats in need of protection, and additional species protections. Consistent with USCOP recommendations, the bill stipulates that the councils must develop management measures that are consistent with the determinations made by the fisheries and marine science subcommittee, but may provide for greater conservation in order to meet management objectives. Furthermore, the Act specifies that determinations made by each Council's fishery and marine science subcommittee of the Council's science and statistical committee must be periodically subject to peer review by qualified independent scientists appointed by the Secretary.

Conclusion

For almost two decades, independent reviews of our fisheries management system have yielded similar conclusions. Science-based fisheries management is too often compromised by political and economic pressures, thus our progress towards ending overfishing and rebuilding depleted fish populations has been limited. Indeed, the governance structure of federal fisheries management needs to strengthen the role of science in management by separating scientific determinations from allocation decisions. Failure to follow scientific recommendations has resulted in ecological deterioration and economic losses. The NPFMC provides an example of a system that has followed scientific advice in setting catch levels and maintained healthy fish populations. Recognizing the success of the North Pacific management regime, the USCOP outlined a model to apply that success nationally. Now it is Congress's turn to heed the call for reform. The Fisheries Science and Management Enhancement Act of 2005 institutionalizes the USCOP recommendations by strengthening the role of science in federal fisheries management. As a panelist at the 2005 AAAS conference, Jeremy Jackson, renowned fisheries biologist, commented, "we already know most of what we need to know. The real challenge is not the science but the interface of science, society and politics."

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