



INTRODUCTION

Session 3 Providing for Fishing Community Stability

- TOPIC 1 RECREATIONAL AND SUBSISTENCE FISHERY CONNECTIONS
- TOPIC 2 INTEGRATING COMMUNITY PROTECTION, JOBS EMPHASIS, AND SEAFOOD QUALITY ASSURANCE
- TOPIC 3 ASSESSMENT AND INTEGRATION OF SOCIAL AND ECONOMIC TRADEOFFS

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The Magnuson-Stevens Fishery Conservation and Management Act (MSA) sets out multiple responsibilities for the National Oceanic and Atmospheric Administration (NOAA) and the Regional Fishery Management Councils. Through legislative authority and national standards, NOAA and the Councils are obligated to conserve the country's living marine resources and simultaneously provide for communities' sustained participation in fisheries. These responsibilities are often cast as in conflict (jobs vs. rebuilding stocks), each an impediment to the other. This conflict, real or perceived, stands as a challenge to effectively managing fisheries in general, and specifically in providing for fishing community sustainability. Placing greater emphasis on community sustainability in our national fisheries policy will require a combination of legislative, policy, and regulatory change. The three topics chosen for this session illuminate the challenges of managers working to advance community stability while balancing the diverse goals and objectives of different communities. A fishing community is defined in law as "a community which is substantially dependent or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." We commonly see application of the term "community" modified based on type of fishery, such as commercial, recreational, or subsistence fishery. Not only are there multiple types of fishing communities, but many individuals may be members of more than one fishing community.

The strong focus of managers on commercial fisheries remains an important social and economic priority for the nation, as it has been since the inception of the country. However, recreational fisheries are also a high priority of contemporary society, with historic cultural and increasingly substantial economic benefits to the nation. Obligations to indigenous cultures and customary subsistence fisheries add to this multiple-objective challenge to policy-makers. The factors that motivate and satisfy the objectives of recreational and subsistence fishing sectors are different, and their social and economic drivers and measures of successful policy outcomes differ. The first focus topic in this session looks at recreational and subsistence fishery connections and how they can optimally be managed in the future to enhance fishing community sustainability, including identifying any necessary legal, policy, and



process changes necessary to reconcile competing goals and objectives between all fishery sectors.

The second focus topic drills deeper beyond the policy level. It highlights specific tools, methods, and means to protect the integrity of fishing communities in general, emphasize fishery-related jobs, and assure domestic seafood quality in the face of future transitions in fishery management, ecosystem, and economic conditions. The session will focus on opportunities to adopt “community-friendly” tools and the legislative, policy, and regulatory changes necessary to apply them in the future.

The final focus topic zeroes in on measuring our fishery management performance, and the degree of community sustainability success, in the context of how such measurements can be better integrated into decision-making on the relevant tradeoff choices. There are different perspectives for monitoring and evaluating the attainment of the greatest overall benefit to the nation, and spe-

cifically fishing community sustainability. This session will identify findings related to how Councils and NOAA can better evaluate the social and economic outcomes of policy choices.

Session 3 Topic 1

Recreational and Subsistence Fishery Connections

In the last few decades, great progress has been made in meeting ambitious goals for conservation and sustainability of fish stocks. While there is still much to be done, the U.S. leads the world in eliminating overfishing and rebuilding overfished stocks. Although all fishing sectors benefit from sustainable stocks, fishery management has affected commercial, recreational, and subsistence fisheries differently. Some believe that shifts in management resulting from a focus on the status of fish stocks have not fully considered the viability of recreational and subsistence fishing. This topic looks at requirements for fishing community sustainability from recreational and subsistence fishery perspectives, and evaluates impediments to, and opportunities for, collaboration to advance community sustainability across all fishery sectors and groups.

As noted in the session description above, recreational and subsistence fishing sectors are motivated by different goals, and their social and economic drivers and measures of successful policy outcomes differ. One objective of this topic is to look at these differences and identify legal, policy, and process reforms that may be necessary for reconciling competing goals and objectives.

The session will be informed by the results of the April 2010 NOAA Recreational Saltwater Fishing Summit (NOAA 2010a). Participants highlighted a range of issues, including better catch, effort, and economic data, improved and more regular communication regionally and nationally, and more consistent inclusion of recreational interests in management processes. Participants also asked to focus on management approaches that recognize the distinct needs of recreational anglers for improved access, more time on the water, and quality fishing experiences. The resulting National Action Agenda for Recreational Fishing (NOAA 2010b) laid out a strategy to address priority concerns of the recreational fishing community. In addition to reflecting on the Summit references and progress made to date, the current session will access results from a 2012-2013 NOAA nationwide survey of anglers to provide insight on angler perceptions of management, management preferences, and expectations for the future.

Discussions during this topic included perspectives on how recreational and subsistence fisheries could be managed to enhance fishing community sustainability, including both impediments and opportunities. Speakers and participants were challenged to identify findings for legal, policy, and process changes necessary for reconciling competing goals and objectives.

Trigger Questions

1. What are the key attributes of a successfully-managed recreational or subsistence fishery?
2. How will recreational and subsistence fishery sector requirements change over the next 10 years?

3. Where is there conflict and where is there convergence on the future of fisheries among recreational, subsistence, and commercial sectors?
4. What changes in legislation, policy, or regulations are necessary to satisfy the essential elements of a sustainable multiple-fishery fishing community?
5. What is the greatest impediment to increasing recreational and subsistence fishery sector satisfaction?

Session 3 Topic 2

Integrating Community Protection, Jobs Emphasis, and Domestic Seafood Quality Assurances

Management innovations in controlling or rebuilding fish stocks, such as annual catch limits, require balancing innovations to address the social and economic needs of fishing communities. Annual catch limits and rebuilding programs designed for fish population sustainability often require short- and long-term adjustments to fishing capacity in both commercial and recreational fisheries. However, fishing controls to improve biological outcomes may conflict with employment and distribution of income goals for the fishery.

Some biologically-derived management policies limiting catch or effort do not adequately account for unintended social and economic consequences; this may also be true for other policies designed specifically for social or economic efficiency, such as catch share programs. Undesirable community or employment outcomes in commercial fisheries could include unchecked consolidation, disproportionately negative impacts on small-scale and geographically-limited fisheries, and impediments to future entry into the fishery. In recreational fisheries, examples might include closures of small support or ancillary businesses such as charter fishing operations, fishing tackle stores, restaurants, or hotels. In some areas, fishery management can be argued to have resulted in significant changes in permit values and other access costs for existing fishermen and new entrants, shifted fishing participation away from local fishermen and communities, resulted in declines in the small-boat owner-operated fishing fleet, and exacerbated the loss of working waterfront infrastructure and “shirt-tail” businesses.

The effects of fishery management policies must also be considered in the broader context of changing market forces (globalization, increased consumption of seafood in Asia), the full range of tools to produce seafood including aquaculture, and economic competition for coastal land (tourism, real estate development).

Thus, there is a need to protect fishing communities from adverse social and economic effects of fishery management decisions, with an emphasis on preserving jobs and ensuring seafood quality. Why jobs? Because an active labor pool helps a business’ access to capital, whether it is used to finance a vessel, gear, fishing permit, or the purchase or lease of quota in a catch share program, and because the amount of jobs related to fishing is inextricably linked to the communities’ overall wellbeing. Why seafood quality? Because quality seafood products help to ensure entry into the marketplace, and seafood quality is a primary determinant of ex-vessel price.

Discussion during this focus topic included whether and to what degree “community-friendly” tools and legislative, policy, and regulatory changes were necessary, as well as how to apply them. Examples included tools, methods, and means to protect the integrity and infrastructure of fishing communities, and to seek optimum yield in the face of future transitions in fishery management and changes in ecosystem and economic conditions. The discussion included potential responses to changing market forces; possible adoption of new management tools that could broaden the economic base of seafood communities, such as integrating aquaculture with fisheries; and exploring the appropriate roles and responsibilities of communities, government, and private sector third-parties in finding ways to support and improve fishing community sustainability.

Trigger Questions

1. Are there new ways for fishermen to organize their business and improve access to permits and quota to ensure benefits flow back to active fishermen and into communities reliant on the resource?



2. What changes in community capacity and innovation in financial capital, improved product quality, and value-added/value-chain seafood products will accelerate fishing community sustainability?
3. What innovative financial and business approaches, including fishing community organizations, can help create and protect sustainable local fisheries?
4. What fishery management tools are available and effective in maintaining fishery jobs, especially in small fishing communities?
5. How can the health of fishing-dependent communities be better preserved when developing fish stock rebuilding programs?
6. How can aquaculture serve as a “community friendly” tool to enhance the integrity of fishing communities and to secure employment and seafood supply objectives?

Session 3 Topic 3

Assessment and Integration of Social and Economic Tradeoffs

Measuring degrees of community sustainability in relation to fishery management performance requires the integration of social and economic metrics. Many of these data are currently unavailable, in some cases due to decisions made by Councils and National Marine Fisheries Service not to require submission of such information. The task is made more difficult because there are many different perspectives on what constitutes the greatest overall benefit to the nation and, more specifically, how fishing community sustainability is defined. However, there is no question about the need to improve the assessment and integration of social and economic tradeoffs in order to improve fishery management decision-making relative to community sustainability.

As the governmental stewards of the nation’s living marine resources, the Councils and National Marine Fisheries Service are tasked with ensuring that long-term environmental benefits in terms of goods and services are not compromised by short-term management activities. However, the bulk of our scientific data and analysis is focused on the biology of fish, not the social and economic conditions of human populations; social and economic impacts are usually given secondary attention. Without sufficient social and economic data and a relevant analytical framework, it is extremely difficult to resolve the following commonplace public policy choices:

1. When should local culture and custom take priority over national interests?
2. How much should the nation invest to make fishing communities more resilient to environmental, economic, and policy threats?
3. Does the incremental economic benefit to the nation of a five-year extension in a 40-year rebuilding plan for a long-lived fish species outweigh the long-term benefits of a shorter rebuilding period?
4. Is advancing wild-caught seafood a higher priority than recreational fishing trips?
5. Is the value of U.S. jobs more important than inexpensive imported fish to consumers?
6. What is the value of passing on a fishing way of life to the next generation?
7. What are the trade-offs to coastal communities between aquaculture and capture fisheries?
8. Are the economic benefits of ecosystem-based fishery management being properly integrated into policy decision-making?

It is relevant to determine whether we have the right policies, tools, processes, and priorities in place to evaluate social and economic tradeoffs that can provide for greater assurances of sustainable fishing communities in the future. Given the competitiveness in the allocation of Federal budgets in at least the near future, considerations for higher-priority assignments to social and economic data integration need be discussed in the context of the many other ocean uses and values besides fisheries, and in the context of competing needs within the fishery management system. This session discussed the need for improvements, and focused on identifying findings to improve current approaches or legislation.

Trigger Questions

1. Do we have clear social and economic objectives in regional fishery management plans? What are the social and economic performance metrics of a sustainable fishery? What data and methods are necessary to measure such success?
2. What is the appropriate role of socioeconomic objectives in fisheries management?
3. How can/should socioeconomic objectives be identified and established?
4. Where socioeconomic objectives have not be identified or included, why haven't they? What are the concerns with reporting socioeconomic data?
5. How can socioeconomic objectives be better integrated into decision-making?
6. How should fishery management be conducted when it is impossible to maximize all sustainable and beneficial uses of the marine environment and there is no clear optimization plan?
7. Do we have the necessary and sufficient authority in the MSA to succeed?
8. Are there alternative means to pay for the future challenges of fisheries management, and do they require statutory, policy, or regulatory changes?

References

NOAA. 2010a. Recreational Saltwater Fishing Summit. <http://tinyurl.com/b7ff2tm>

NOAA. 2010b. Recreational Saltwater Fisheries Action Agenda. <http://tinyurl.com/2fkcykv>



TRIBAL DIPNETTING AT CELILO FALLS ON THE COLUMBIA RIVER BETWEEN OREGON AND WASHINGTON. CELILO FALLS WAS A FISHING, GATHERING AND TRADING HUB FOR THOUSANDS OF YEARS BEFORE IT WAS INUNDATED BY CONSTRUCTION OF THE DALLES DAM IN 1957. PHOTO: BONNEVILLE POWER ADMINISTRATION.



PAPERS

Session 3 Providing for Fishery Community Stability

Topic 1 Recreational and Subsistence Fishery Connections

ADVANCING SUSTAINABLE SUBSISTENCE FISHING COMMUNITIES: MANNY DUENAS

ADVANCING SUSTAINABLE RECREATIONAL FISHING COMMUNITIES THROUGH IMPROVED COMMUNICATION
AND COLLABORATION: KEN FRANKE

SALTWATER RECREATIONAL FISHING: MANAGEMENT FOR WHAT IT IS—NOT FOR WHAT IT WAS: MIKE
NUSSMAN

Advancing Sustainable Subsistence Fishing Communities

MANNY DUENAS

PRESIDENT, GUAM FISHERMEN'S COOPERATIVE



Introduction

Fishing communities, and specifically the subsistence and recreational fishers within these communities, will continue to face tremendous challenges over the coming years. Without change, competing interests will continue to reduce the size of these fishing groups, through obstacles such as severely reduced ocean access rights and mandates that do not account for community priorities or traditional values. Several steps can be taken to reincorporate community needs and to consider regional priorities within the management process, increasing the sustainability of fishing communities that have existed for millennia.

Background

Before comparing recreational and subsistence fisheries, we must first examine the meaning of the terms. A subsistence fishery is the fishery that mankind has known since the dawn of time and is practiced by artisans. The purpose of a subsistence fishery has been and will always be to provide for the basic human need: food. In communities, fishers were no different from other artisans: those that had excellent skill-sets provided food for the community and those who did not, moved on.

For the most part, the subsistence fishery has taken a real beating in today's economic and cultural standards for a couple of reasons. The first reason results from a misconception or a misunderstanding; subsistence fishers are too often lumped into the commercial category. "Commercial" is the designation used to describe any fisher who sells fish—even one fish in order to pay for vessel safety requirements—in a one-size-fits-all world. This general application of commercial does an injustice to subsistence fishers, especially since all commercial fishers are subject to an expensive array of safety rules and regulations that are unaffordable to subsistence fishers.

Similarly, by going fishing, the intent of the subsistence fisher is not to profit, but rather to perpetuate a community tradition while maintaining a standard of living comparable to others in the community. Traditions do evolve, but they do not become any less meaningful in the process. Would the celebrating of Thanksgiving be any less traditional today since turkeys and ham are purchased at supermarkets, as opposed to eating fresh game?

When man first provided marine life to the community, it was for personal consumption. From there, a bartering or exchange society slowly evolved. Fish were traded for clothing, starches, and other such basic necessities. Today, bartering is a practice long gone and, as with all other artisanal expertise, it has transitioned to a cash-based exchange. Still, the intent of subsistence fishers has not changed. The change is just with how modern, basic needs are met. Subsistence means "the minimum necessary to support life," at least according to dear old Mr. Webster. By today's standards, unless you are Amish, that means: running water, electricity, cable TV, cellular phones, bank loans, taxes, medical services, and so forth. A person cannot logically say that because one fish is sold, it is a commercial endeavor. Does changing the oil in the family's car mean that you are operating a service station?

For tens of thousands of years it was the basic need for marine food that established this group of artisans. Not ev-

everyone was or is capable of becoming a hunter, fisher, carpenter, doctor, lawyer, or even the President of the United States (while the latter may be debatable). Even within the fisher group, fishermen differ in their capabilities, as they utilize various types of fishing and gear.

Recreational fishers have a different intent and are not defined by their skill-sets in the same way that a subsistence fisher would be. As a designation, “recreational fishery” is rather general and can be applied to a vast majority of fishers who seek pleasure through the act of fishing for a multitude of reasons. Recreation is basically a refreshment of strength and spirit after a toil; there is a grand difference between it and subsistence. For most recreational participants, the age-old experience is just to catch a fish for bragging rights, to have stories and experiences to talk about, to display a trophy catch, to have fun, or just because the opportunity presents itself. Ultimately, all of the reasons include a sense of accomplishment and all provide some form of pleasure.

While the recreational fishery has evolved and travelled a separate path from subsistence fishing, for the most part, the two are still similar. Except for the likes of Jimmy Houston, a large number of recreational fishers eat their catch and charter boats eat or sell what is caught. The charter vessel and its captain affords the angler with a once-in-a-lifetime opportunity. Private boat owners are also part of this universe of pleasure seekers or adventurers. Some refer to them as weekend warriors, fishing when disposable time is available, though hardly out of any necessity. Yet, at the end of the day, both user groups stem from the same community and both are consumers of marine life. Is there a difference between the two worlds? Yes. But, are they alike? Yes.



Fishery Management Requirements

A successfully managed subsistence or recreational fishery would incorporate the following methods

- True stakeholder involvement: Some may be puzzled by the term “true stakeholder involvement.” The true stakeholder is the fisherman. To use a coined phrase, they are “the first stewards,” but too often true stakeholder involvement is not what occurs: everyone else is also included. The subsistence fisher, with calloused hands and a weatherbeaten face, is destined to face the elements without care just to meet his family’s and the community’s needs. As another true stakeholder, we have the recreational fisher clothed in the latest fashion in search of the fish to mount over the mantle. Both have interest in the health of the marine ecosystem. The fishery management councils are a great example of true stakeholder involvement. However, like any process affecting fisheries, the voices of the stewards of the sea are like the whispers at a rock concert, mouths moving but they cannot be heard.
- Cooperative scientific research: This type of scientific approach should be the method used in fishery management. Fishermen should be consulted during the analysis of fishery data. Fishermen should also be consulted on the use of visual analysis tools, such as underwater cameras or other scientific technology to weigh in on their efficacy. Fishermen may suggest a research project for the scientist to consider, but may receive a response like, “Sorry, no funds are available, but guess what? What we do have is the “best available science,” so your annual catch limit is cut by fifty percent.”
- A holistic or ecosystem-based approach to fishery management: In determining annual catch limits or harvest levels, the parameters by which a fishery is analyzed are one dimensional, based on historical catch. Weather, moon phases, water conditions, salinity, acidification, the age of fishermen, vessel operations, and most especially, human factors should all be included in the analysis.

The Future of the Fisheries

In the coming years, both recreational and subsistence fisheries will continue to decline due to industrialization, the use of mandates to pursue agendas, competing uses of the marine environment, and the changing demographics of fishers.



Over time, communities, including subsistence-based communities, will increase their purchasing power and purchase from supermarkets as the industrialized harvesting provides inexpensive marine products, such as pre-packaged meals, canned tuna, frozen gassed tuna loins, or even artificial crab meat, with Maine lobster probably the next product of chemistry. But, after all is said and done, it will be the ever-rising cost to operate a subsistence or recreational vessel that will largely ensure the demise of the fisheries.

In terms of attempts to preserve traditions, the cultural value of marine resources will be overwhelmed by agenda-driven conservation concerns. The assault on small fisheries is not coming from a single front, but through the use of various mandates. The Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Sanctuaries, and marine protected areas all have been used where fishery science has prevailed.

This was demonstrated when the Hawaii-based longline fishery was shut down due to concerns over the extinction of seabirds and sea turtles. This was reasoning enough to shut down the fishery. In the end, a Biological Opinion allowed for incidental takes of the two species and the fishery re-opened. Then, lo and behold, whales were added to the list of concerns and, for the nearshore troll fishery, dolphins were added. Will it ever end? No. And, will these mandates make an impact on a global scale? No. The transferred effect lives on.

Other uses of the marine environment will be prioritized above fishing and perhaps even habitat concerns. Fishing ports will become development areas for condos. Coastal marine spatial planning will set priority use areas. Military training areas, shipping lanes, habitat areas of particular concern, high recreational use areas (paddle clubs, jet skis, windsurfers, etc.), marine protected areas or Sanctuaries, and so forth, will all be part of the mapping scheme.

In addition to all of these challenges, for subsistence fishing, the ultimate factor may be the continued decline in the number of fishermen. The average age for a fisherman in Guam is 50 years. What is it for the nation? Probably the same; age, coupled with the ever increasing cost, and subsistence fishing will have a featured section in the Smithsonian.

Recommendations

To perpetuate the fisheries and to satisfy the essential elements of a sustainable, multi-sector fishing community will require changes to legislative mandates, the establishment of clear and concise policies, and a change in priorities used during the development of new regulations. Several steps can be taken to help ensure the survivability of America's fisheries.

Legislatively, mandates need to be reviewed and the process for creating new legislation needs to be revised to include regional considerations. Reviews of the ESA and MMPA are needed, which includes evaluating the legislations' impacts on communities, especially fisheries. Reviews are also needed on the use of the Sanctuaries Act and Antiquities Act, which have been used to advance an ideology without the approval of the people affected. Finally, all future legislation should incorporate the Regional Fishery Management Councils as partners when addressing concerns affecting the marine environment. The Coral Reef Conservation Act is an example of a time when Councils were excluded from the legislation development process, despite fisheries having been a focal point of the greater part of that exercise.

Similarly, clear and concise policies are needed. A review of previous and future actions taken by agencies is needed to ensure that agencies' actions adhere to the Administration's policy directives. One example of this is the National Oceanic and Atmospheric Administration's (NOAA's) effort to establish regimes which would adversely affect U.S. fisheries, while the President continues to emphasize the need to keep Americans employed and the economy growing. Does this not apply to fishers? When creating new policies, the process should be community-driven, not

agenda-driven. More effort on rebuilding America is necessary, one community at a time.

To ensure the sustainability of a multiple sector fishing community, the process for developing regulations should also be revised. Regulations should be promulgated to minimize wanton waste of marine resources. Regulatory discards have no logical place in fishery management, especially when the catch is already dead and can be consumed. As with policies, regulations should be community-driven. They should be based on the community's input and their preferred management regimes.

Recreational and Subsistence Satisfaction

There are a multitude of impediments to increasing the satisfaction of the recreational and subsistence sectors, but the greatest impediment is the ever-shrinking access to marine areas. The reduction in access rights includes an array of impediments. One such issue has been the lack of expansion of marinas and boat ramps, coupled with a rampant loss of existing amenities. As with commercial fisheries, shore-side amenities available to recreational fishers are slowly being swallowed up by all sorts of development interests. One of the only funding sources for marinas or boat ramps is the U.S. Fish and Wildlife Service's Sport Fish Restoration and Boating Trust Fund. There is a need for Federal funding to address the needs of this community on a national basis. With the exception of high-end marinas, where the users are financially able to pay moorage fees, the majority of boaters are subject to purchasing gas guzzling 4x4s and boats on trailers.

Traditional ocean access areas are now highly valued property areas, where access is no longer allowed and large no trespassing signs are posted. The once free roaming fishing areas lining the coast are now part of the Coastal Marine Spatial Planning exercise, with the fishing user group receiving little acknowledgement. Designated navigational areas, areas containing habitat areas of particular concern or critical habitats (regularly situated outside of a high end beach front housing area), marine protected areas, Sanctuaries, marine mammal avoidance areas, military exercise areas, Homeland Security Zones, and so forth, will all receive increased consideration. Another impediment to user satisfaction results from overcrowding in the marinas by other expanding user groups, such as sailboats, yachts, live-aboards, and recreational vessels, as well as fishing vessels of all means. Coastal fishing areas have been inundated by large numbers of Jet Skis, paddle boats, windsurfers, swimmers, beachgoers, and many others. There was a time when the only vessel one would see on the water would be a fishing boat, a cargo ship, or maybe a passenger liner. That is certainly not the case today.

At a more general level to the impediments stemming from issues with access rights, the rules of engagement for all of the impacted user groups are complicated and cumbersome, which reduces fishers' satisfaction. If one were to compile all of the fishing and marine regulations into one book, it could probably only be viewed at the Library of Congress.

Conclusion

In closing, there is room to perpetuate the traditions, both old and new, that once made America great. It just requires the political will to return this country back to the people and its resources back to the community through the establishment of community and culturally managed areas for the benefit of such.



Advancing Sustainable Recreational Fishing Communities Through Improved Communication and Collaboration

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Navigating through life has its triumphs and pitfalls. We seek one and avoid the other. Every once in a while we hear something that strikes an unforgettable chord, something that sets the stage for the sought-after triumphs. It happened to me about fifteen years ago when I was listening to a presentation by Jack Hawkins, a well-known pastor in California. He had a gift of reaching into your thoughts and triggering the creation of what he referred to as

guardrails: simple rules to apply in life, to protect you and those around you from pain and conflict. My wife Karen and I often look at each other when we hear something bad happening and say “they needed some *guardrails*.”



A key element, according to Pastor Hawkins, was to avoid putting one's self in a position of preventable risk and to “seek to understand.” He closed the equation with the following comment: “*Rules without relationships lead to rebellion.*” Since hearing that speech I have found truth, leadership and courage buried within their meaning. The implications can be applied to relationships with our children, friends, coworkers, and those we do business with. I have personally experienced a history where these words have had meaning in how I perceive the future path of managing our nation's oceans.

With the implementation of the Magnuson-Stevens Act thirty-seven years ago, U.S. fisheries changed. We began the long process of developing *guardrails*. Boundaries were set, species were measured, gear was identified, allocation was quantified, science was advanced—and so it started. Much of this effort was focused toward managing fisheries from a commercial fishing perspective. In the absence of foreign vessels, they now controlled the playing field.

A lot has changed during the past four decades. Technology, markets, access, and the impacted parties have transitioned. There is more accountability and structure coming out of the regional Council processes, and the Councils' associated recommendations. However, input to the Council process is a direct product of data and input by those with the knowledge and understanding of how the system works. In the absence of participation, a party with no representation and/or understanding of the process can be left out in the cold. I often wonder in how many cases anglers don't even know there is a Council process affecting their future? How many parties with an interest in our nation's ocean resource have a true comprehension of how it is managed, especially in the case of the recreational angler? How do we get them to the table?

With few exceptions, recreational fishing has long been on the periphery of the management process. Scientists, the commercial fishing industry, environmental organizations, and regulatory agencies on the other hand have typically been better informed as to the management processes. The average recreational angler simply wants to enjoy the family fishing experience while enjoying the ocean's beauty. Furthest from their mind is to be engaged in rule making, heated discussion over access, or any of the many points of potential conflict. Absent organized fishing clubs or industry associations, the recreational community usually does not engage or communicate with the management process.

Ironically this relatively peripheral group does have a significant economic impact on the national economy. In a 2011 National Marine Fisheries Service Economic Impact Report¹, recreational saltwater anglers reportedly made 71 million fishing trips, 60 percent of the 357 million marine recreational fish caught were released, and \$19.5 billion was spent by anglers, representing \$73 billion in total economic impact and supporting over 327,000 U.S. jobs.

On average, 12 million recreational anglers² fish annually in the United States. The recreational fishing community has an important stake in the future. With this impact on the resource and economy it is important to ensure that recreational fishing community is fully engaged, as all impacted parties should be, as we proceed into the re-authorization of the Magnuson-Stevens Act.

A Matter of Perspective

When you are seated in a stadium watching a ball game, your perspective varies with your location in the stands. In this instance our stadium is the nation's oceans, and the ball game is managing our living marine resources. Our perspectives will all be different, supplemented by varying levels of education, geography, and experiences. Depending on where you sit, you could make the right or wrong call. Behind the catcher you may see balls and strikes better. Sitting in the bleachers down the right field line you may make the right call about a foul or fair ball. The point is that each one of the seats is important to the ultimate outcome of the game. All seats (bleacher and box-seats) and all views are important (whether commercial, recreational, environmental or scientific) in getting the right answer.

All would agree the future effectiveness of our oceans policies will depend on incorporating balanced and reasonable input into our policy design. The way we conduct fisheries in the future will be based in part on lessons learned from the past.

From my perspective on the southwest coast of California, I would like to share a lesson that involves both travesty and triumph. It applies to our future rulemaking efforts and is focused on process.

Case Study: Bocaccio

Fifteen to twenty years ago, recreational fishermen in the southwest had little interaction with NOAA or policy issues. It was a relatively open ocean and they fished with a sense of freedom. I doubt if many of them knew what the Council was or did. I admit I was one of the many. I suspect most of the local commercial fishermen were right there with us in our world of blissful ignorance.

Lightning struck, and we were suddenly thrust into the world of closures, limits, and access restrictions. Bottom-fishing restrictions put boats and landings out of business. One fish in particular that caused extreme pain to the recreational and commercial fishing fleets was the bocaccio rockfish, which is managed under the Pacific Fishery Management Council's groundfish fishery management plan.

From the scientists' perspective, bocaccio were in serious trouble. Their stock assessment and other data points said so. From the managers' perspective, since the scientists said the health of this species was in decline, area closures had to be put into place immediately to protect this fish. As a result, almost every fisherman lost their winter schedules of fishing. There was little time to react.

From the fishermen's perspective, bocaccio were everywhere. One indicator, the fleet's catch records, did show a reduction in the number of bocaccio being caught. From the fishermen's experience, however, they knew bocaccio had worms when caught in shallow water, and the customers did not want them. By using sidescan sonar technology and experience, fishermen were good at avoiding them intentionally, explaining the reduced catches. The fishermen were not organized enough to convey this information, and frankly few understood how the regulations happened



1 http://stateofthecoast.noaa.gov/rec_fishing/welcome.html

2 http://stateofthecoast.noaa.gov/rec_fishing/saltwater_anglers.html

or what process shut down operations. They were simply “closed for business.” The fishermen were angry, especially because there was almost no warning.

Out of this mess, several leaders moved into the show. A meeting of the minds was scheduled at the request of our past Sportfishing Association President, Bob Fletcher. Captains from the fleet, scientists from the California Department of Fish and Wildlife (CDFW), and scientists from NOAA sat down to put on the table their views of what was occurring in the ocean. Each had a different seat in the stadium. The science side explained the process and the belief the resource was in trouble. The fishermen came armed with video of anglers catching large bocaccio and sidescan displays depicting massive schools under their boats. Objectively, the scientists recognized the fishermen did have some good information they had not tapped into. Somewhere in this process there was a serious disconnect. Anecdotal as they were, it was tough to discount the observations of the fishermen, seen on a daily basis.



From that first meeting the problem was clear: the science community and fishing community in this instance had *no working relationship*. Until then they had not been talking, and each was doing their own thing when their paths collided. The discussion at that meeting was difficult at first, but was constructive. The end result was the fishermen would participate in a hook and line survey and that a boat would be outfitted to support a NOAA remotely operated vehicle (ROV) and sonar array.³ The fishermen were going to get a chance to show the scientists what they were seeing on the ocean.

I give credit to those first CDFW and NOAA scientists who worked with our fishermen. They went to sea and spent months on the water each year looking at the ballpark from our seats. Eventually the fleet presented awards to Dr. John Butler (ROV Leader) and Dr. David Demer (Acoustic Leader) for their exemplary work with the fleet.

Thousands of miles of ocean were mapped, and hundreds of transects with the ROV were conducted. The information flowed in two directions. The fishermen learned what the scientists’ concerns were and about the management process, and the scientists received generations worth of fishing knowledge. Fishermen from throughout the fleet provided extensive habitat data to NOAA acoustic scientists to speed up the learning process for multi-beam and acoustic data collection. After all was said and done, it was determined the bocaccio “crisis” was not as bad as initially thought, and access was restored after a few years. They continue to be avoided.

Out of this difficult time a relationship grew between the fishermen and scientists in the Southwest Region. Everyone has recognized the importance of collaborating, learning from each other, respecting views, and sharing a common goal. At this point, trust has been built between the fishermen in our region and the NOAA/CDFW scientists. It was exemplified when a new acoustic/ROV survey method began the peer review process stemming from work on the fishermen’s boats. A visiting scientist made a comment to a group that fishermen would be mistrustful of the new acoustic/ROV methods. They would consider it “voodoo” and not support rules stemming from it. A fisherman stood up and said, “With all due respect, sir, we worked with the scientists for many years at sea to develop this process. They have our trust.” A conclusion can be drawn from that comment that “rules with relationships lead to solutions.” I would be remiss in not mentioning that the product of this relationship may be a new standard in how to survey bottomfish in high relief areas so no harm to habitat or fish is caused by the acoustic/optical process.

The moral of the story is we need some good *guardrails* as we manage our nation’s oceans. This example put at risk millions of dollars of economic impact and thousands of people’s livelihoods. Had the relationship been in place earlier, the science community may have had more information, their *guardrail*, to work with when providing the Council their advice on the stock’s condition.

3 <http://tinyurl.com/l63mvyx>

Engagement

It is vitally important for all constituency groups to be represented at the table and engaged in the process of developing appropriate and reasonable rulemaking. For this to be effective the leadership of NOAA needs to continue its efforts to seek out all impacted parties in their efforts to develop policy. This will take extraordinary work. Identification of impacted parties should be Step 1 as we move forward, followed by establishing large and varied communications with those parties. This includes social media and developing critical communications infrastructure. Putting a website online as a standalone accomplishment is not acceptable.

From a recreational fishing industry perspective, we have struggled to get our stakeholders involved in management. Awareness has grown over the past ten years as to the need for active participation, but it is a work in progress. The recreational fishing public needs to make connection a high priority. For the survival of our marine recreation industry, our future requires that we establish solid and frequent dialogue with NOAA and the Councils. We, the community, need to help identify our fellow impacted recreational fishermen. Successful policy making needs these critical relationships, and the public needs to be connected to the process. The challenge is how to get that connection established with the angler on the beach or at the end of the pier.

NOAA has been making good strides to connect with recreational anglers. They conducted a Recreational Fishing Summit⁴ to help mobilize the recreational constituency's interaction with the agency, appointed a National Recreational Policy Advisor, initiated Regional Coordinator Positions, appointed a Recreational Fishing Working Group to support the Marine Fisheries Advisory Committee⁵ (MAFAC), and are scheduling regional workshops. Also, MAFAC just completed a detailed visioning document (Vision 2020)⁶ to help NOAA see through the eyes of affected parties. This group of volunteers meets biannually to provide advice to the Secretary of Commerce and NOAA on behalf of representatives of the environmental, recreational fishing, commercial fishing, aquaculture, and conservation communities.

The responsibility to help build relationships is not only NOAA's, but also belongs to resource user groups themselves. It is important that all stakeholders plug into the communications pipeline so that there is informed consensus as policy making proceeds. This may even involve cross-pollinating interests, with opposing interest groups working in concert.



Case Study: Barotrauma

The evolving development of barotrauma solutions is a good example of such cross-pollination. In this instance the collaboration is comprised of NOAA, CDFW, fishermen, and several environmental groups. The project goal is to study and implement the use of descending devices to counter barotrauma⁷ mortality. Because of the relationships that now exist, scientists and fishermen are expediting the placement of acoustic receivers to track the movements of fish released with descending devices. The scientists and fishermen have tagged and released rockfish using the devices (provided by World Wildlife Fund, or WWF) and are studying their long-term effectiveness using the receivers.

The fishermen in turn are working with WWF and the San Diego Oceans Foundation to educate and encourage the public in the use of such devices. The early results have been so astounding that every commercial passenger sportfishing vessel in California is now voluntarily using the devices to save fish. Fishermen have also asked CDFW to place a checkbox on their logbook form to demonstrate they are voluntarily using the devices, and CDFW has agreed. We now have a self-imposed *guardrail* where anglers are releasing fish in healthy condition at depth. This will

4 <http://tinyurl.com/b7fl2tm>

5 <http://tinyurl.com/lod5ye6>

6 <http://tinyurl.com/bla3ab>

7 <http://swfsc.noaa.gov/barotrauma/>

positively affect rulemaking on ocean access in the near future. It is another step toward ensuring the sustainability of our fishing community.



Conclusion

For the sake of our nation's oceans I hope that the scientists, fishermen, and other affected parties continue to seek each other out and to seek opportunities where a shared goal can be targeted. From a process standpoint, all future policy development should articulate a requirement for such collaboration. As a starting point the foundation of such articulation could be policy embedded in the reauthorization of the Magnuson-Stevens Act. The intent would be to make such a process a new way of doing day-to-day business in our efforts to manage our ocean resources.

Back to that statement, "rules without relationship leads to rebellion." Seeking out all impacted parties at Step 1 saves us from the "rebellion." The question needs to be posed, "How much litigation could be prevented with good relationship building?" Speaking *with* constituents before action is taken and not *at* them after it is taken can save millions of dollars in wasted litigation expenses.

This is where good leadership comes in. No shortcuts. Establish good *guardrails*. Do the due diligence right out of the gate. Involve everyone. *Seek to understand and really listen*. It will protect government agencies and the affected parties from pain and conflict. Build the relationship and make sure the staff of your organization is doing the same thing. Build a robust ocean for our children to enjoy!

It all starts with a relationship...

Saltwater Recreational Fishing: Management for What It Is—Not for What It Was

MIKE NUSSMAN
PRESIDENT AND CEO
AMERICAN SPORTFISHING ASSOCIATION

Introduction

There's a reason why each year Americans spend \$646 billion on outdoor recreation: because spending time in the outdoors is *fun*. Despite a litany of time constraints and competing activities, each year, more than 140 million Americans find time to head outdoors. Fortunately for the U.S. economy, outdoor recreation is big business, supporting nearly 6.1 million jobs. Annually, the dollars that consumers spend on outdoor recreation are more than what is spent on pharmaceuticals and household utilities combined, and are on par with financial services and insurance.

In addition to its role as an economic driver, outdoor recreation also plays a significant role in the conservation and management of our nation's natural resources. For example, recreational fishermen contribute nearly \$1.5 billion annually to fisheries conservation and environmental successes through fishing license purchases, the Federal manufacturers' excise tax on fishing equipment, the excise tax on motorboat fuel, and direct donations.

Despite its economic impact and paying for the bulk of conservation efforts, outdoor recreation is not often thought of in economic terms. The economic expenditures are both diverse and diffuse, including lodging, apparel, fuel, food, vehicles, entrance fees, licenses, and more. But because the economic impacts aren't as readily apparent as many commercial activities, outdoor recreation is typically viewed simply as a pastime or hobby. In that same vein, even natural resource managers tend to take the "partakers" in outdoor recreation less seriously and do not focus adequate attention on facilitating and promoting outdoor recreation, particularly among Federal agencies. Perhaps nowhere is this more apparent than in Federal saltwater fisheries management.



The Landscape of Marine Fisheries Management

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) was originally passed in 1976 amid a variety of other landmark environmental laws, such as the Clean Water Act, prompted by decades of unfettered industrialization. The primary purpose of the original law was to extend the U.S. exclusive economic zone to 200 miles offshore and eliminate competition from the foreign fishing fleets off our coasts. At that time few, if any, in the Congress or the Administration gave much thought to management of marine recreational fishing. Boating and fish-catching technology were, by today's measure, relatively primitive. Most anglers stayed closer to shore and were less efficient.

Since then, saltwater recreational fishing has changed dramatically. Substantial technological improvements to fishing gear and boats have made it easier to target and catch fish, allowing anglers to travel further offshore in pursuit of new fishing opportunities. Along with the nation's growing population, saltwater recreational fishing participation

has increased substantially as well. In 2006—the last year the National Marine Fisheries Service (NMFS) generated national estimates of effort and participation—24.7 million saltwater anglers took nearly 100 million recreational fishing trips. The 533,813 jobs supported by saltwater recreational fishing is nearly equal to that of commercial fishing (611,372 jobs) when considering non-imported seafood.



Despite substantial increases over the last several decades in recreational fishing participation and associated economic activity, the importance of recreational fishing is still not reflected in the Federal marine fisheries management process, which remains primarily focused on commercial fishing. One explanation for this disparity may simply be the very nature of the commercial and recreational sectors. The number of commercial fishermen is small relative to the number of recreational fishermen. The number of businesses that commercial fishermen buy their supplies from and sell their fish to is even smaller. As a result, the commercial activity moves through a smaller number of hands and is a larger payday in those businesses' pockets. This makes it much easier for the commercial sector to build a cohesive base that secures attention from the agency responsible for collecting the science affecting their sector.

Another explanation for the focus of the fisheries management system on commercial fishing over recreational fishing is the substantial difference in overall take between the two sectors. As a science-based agency, much of NOAA's focus is on the biological interactions of fisheries. Given that commercial fishing is responsible for 98 percent of the overall harvest of marine finfish, and recreational fishing is responsible for only 2 percent, it may seem natural for fisheries managers to focus limited resources and attention on commercially important fisheries at the expense of recreational fisheries.

While these ideas may help explain why we have a commercially-focused Federal fisheries law and management system, they certainly do not justify the disparity given the substantial economic contributions of the nation's 24.7 million saltwater anglers. As the nation's coastal population continues to grow along with interest in saltwater recreational fishing, significant improvements must be made to shape the nation's Federal fisheries system in a way that recognizes and responds to the needs of the recreational fishing community.

Ways to Improve the Status Quo

After decades of focusing almost exclusively on commercial fisheries management, in recent years NMFS has attempted to improve its relationship with the recreational fishing community. In 2010, NMFS hosted a recreational fishing summit to demonstrate its commitment to improving the level of trust between NMFS and the saltwater recreational fishing community. That conference prompted an action agenda that outlined specific goals, objectives, and actions based on feedback received from participants, and many of those actions have been completed. While significant progress has been made, many historic and institutional hurdles must be overcome for NMFS to manage recreational fishing at the same level of focus and attention as commercial fishing.

Throughout the agency, NMFS must recognize the need to better serve recreational fishermen, continue to learn about the priorities of the recreational fishing community, and make an effort to address them. The problems with that have arisen from our Federal fisheries management system from the perspective of recreational fishermen are rooted in three fundamental flaws:

- Recreational fishing activity is generally managed with the same tools as commercial fishing.
- Management strategies assume that sufficient fisheries data is available for all fish stocks.
- Fishery managers lack incentive to reexamine allocations in mixed sector fisheries.

Recreational fishermen have vastly different motivations than commercial fishermen. Commercial fishermen attempt to maximize harvestable poundage as efficiently as possible—a goal shared by very few recreational fishermen. While harvesting fish is an important component of recreational fishing trips, the overall goal of most recreational fishermen is an enjoyable experience that is largely driven by fishing opportunity.

The status quo approach in both recreational and commercial fisheries is to set annual catch limits at or near maximum sustainable yield. While this may be an ideal management strategy for commercial fishing, i.e., where harvesting the most biomass is desired, it has proven frustrating for managing recreational fishing in many cases because it does not manage for the desires of anglers, who are more interested in abundance, i.e., ease of finding fish to catch, size structure, i.e., sufficient abundance of fish of desired size; and lengthy seasons, i.e., ample opportunities to get out on the water. The Federal fisheries management system should look towards examples of terrestrial wildlife and freshwater fisheries management in terms of managing recreational activities for maximizing opportunity, not solely for maximizing yield.

Another part of what makes poundage-based annual catch limits undesirable for many recreational fisheries is that fisheries data on which regulations are based are often not only outdated, but in some cases are completely lacking for recreational fisheries. This applies to both biological data, such as stock assessments, and angler harvest data, which is estimated every few months based on angler surveys. Because data are not readily available, a high amount of unpredictability surrounds fishing seasons and regulations. The quotas for recreational anglers in a fishery may be based on information about a fish stock from one or more years prior, and angler harvest is not available quickly enough to allow managers to make inseason adjustments.

Too often this has led to abrupt fishing season closures once harvest data becomes available that show the quota has been exceeded. Fishing trips must be cancelled, causing severe impacts on businesses that depend on fishing trip revenue. Due to the accountability measures under the reauthorized Magnuson-Stevens Act (MSA), anglers and recreational fishing-dependent businesses may be further penalized with a reduced quota for the following season. Under this system, anglers and the recreational fishing industry are the ones held “accountable” by the mistakes of Federal managers, at severe costs to businesses and coastal communities. Managers must explore and consider alternative ways to set recreational fishing regulations in a manner that provides for greater predictability and confidence in the system, while continuously striving for more and better fisheries data.



However, policymakers must recognize that practical realities make it impossible to have sufficient data on all Federally-managed stocks. Of the 528 Federally-managed fish stocks, only 119 are considered adequately assessed. And while improvements have been made to the saltwater angler harvest data collection system, now called the Marine Recreational Information Program, real-time harvest data will never be possible given the nature of recreational fishing taking place from millions of boats, piers and shorelines across the country. These data limitations, combined with the unique goals of anglers, require that a different approach for managing recreational fishing—one that is based on opportunity rather than solely on yield—be explored and considered.

For the numerous recreationally-important fisheries that also have a commercial component, allocations have been, and will continue to be, a point of contention that fishery managers must address. The projected growth in recreational fishing participation will further heighten the degree of competition for limited fisheries resources both within and between sectors. In order to better maximize the economic benefits of these fisheries to the nation, fishery managers must periodically reexamine how fisheries are allocated, but no such approach has been developed to date.

Most fishery allocations are based on decades-old criteria and do not reflect current socioeconomic or conservation conditions. Unfortunately, the current fishery management framework lacks any incentive for managers to address these outdated allocations. The current guidance in the National Standard 4 of MSA simply calls for allocations to be “fair and equitable,” which can be interpreted so subjectively as to lack any real meaning. Because allocation discussions are inherently contentious, and because there are a litany of other important issues to address, fishery managers consistently delay or ignore addressing allocations.



Clearly, the current framework has succeeded only in solidifying existing allocations in perpetuity (which may be considered a success by some). The recent report conducted for NMFS by George Lapointe, “Marine Fishery Allocation Issues: Findings, Discussion, and Options,” highlighted that neither the Councils nor NMFS view themselves as in charge of comprehensively addressing reallocation. A new approach is needed that requires the Councils to examine if all current allocations are truly in the best interest of the nation, and if not, conduct a process to reallocate. Formal guidance that describes criteria Councils should consider during potential reallocation decisions is needed to guide the process and ensure consistency and transparency.

Conclusion

There is not a single entity or individual with a clear vision for the future of saltwater recreational fisheries management, which makes it nearly impossible to determine success. Many in the recreational community are good at saying what they are against, such as restricting access or seemingly arbitrary closures of important fisheries, but the community has a harder time defining what it wants. What constitutes a well-managed recreational fishery? And how do we get there? Because recreational fishing has never been a priority for NMFS, the agency does not have these answers either.

During most of the 20th century, before saltwater recreational fishing achieved the current high level of popularity and impact on the resource, managers were able to get by with managing recreational fishing secondarily under a system designed for commercial fishing. While this approach has worked adequately in some instances, in many others it is clear that a new approach is needed that recognizes the values, motivations, and impacts of recreational fishing. It is time to collectively develop a vision for what constitutes a well-managed recreational fishery and how the fishery management framework can achieve that vision across the country.



DISCUSSION SUMMARY AND FINDINGS

Session 3 Topic 1

Recreational and Subsistence Fishery Connections

Speakers

MANNY DUENAS, PRESIDENT, GUAM FISHERMEN'S COOPERATIVE
KEN FRANKE, PRESIDENT, SPORTFISHING ASSOCIATION OF CALIFORNIA
MIKE NUSSMAN, PRESIDENT AND CEO, AMERICAN SPORTFISHING ASSOCIATION

Panelists

STEVE JONER, FISHERY BIOLOGIST, WEST COAST TREATY TRIBES
ANDY MEZIRROW, OWNER/OPERATOR, CRACKERJACK SPORTFISHING, SEWARD, ALASKA
CRAIG SEVERANCE, EMERITUS PROFESSOR, UNIVERSITY OF HAWAII, HILO T.J. TATE, EXECUTIVE DIRECTOR,
GULF OF MEXICO REEF FISH SHAREHOLDERS' ALLIANCE

Rapporteurs

JOHN BUTTERFIELD, POLICY INTERN, OFFICE OF POLICY, NOAA FISHERIES SERVICE
HEIDI LOVETT, POLICY ANALYST, OFFICE OF POLICY, NOAA FISHERIES SERVICE

Moderator

MARK HOLLIDAY, DIRECTOR, OFFICE OF POLICY, NOAA FISHERIES SERVICE

Discussion Summary and Findings: Recreational and Subsistence Fishery Connections

Although great progress has been made under the Magnuson-Stevens Act (MSA) in adopting and achieving ambitious goals for conservation and sustainability of fish stocks, management measures have not always fully considered the structure and viability of recreational and subsistence fishing. This topic examined fishing community sustainability from the recreational and subsistence fishery perspectives, and provided an opportunity to evaluate impediments and opportunities to advance community sustainability across all fishery sectors.



The invited speakers and panelists were selected to represent the different factors that motivate and satisfy participants in the recreational and subsistence fishing sectors, each with different social and economic drivers, and different measures of successful policy outcomes. Individual and regional examples of recreational angling from an individual participant and business perspective (e.g., fishing-for-hire) were provided. Customary and traditional uses of fish and fishing as part of the cultural traditions, heritage and community norms for food, celebrations/holidays, barter and gifts were described. Together these descriptions demonstrated and exemplified the many differences, but also the similar goals and concern for healthy and sustainable fisheries that fishermen share.

While fishing access may be a common goal among recreational, subsistence, and commercial fishermen, the reasons or motivations for wanting fishing access can be very different. The discussion highlighted that even within the wider recreational fishing community, there is not a single, unified vision or goal of what saltwater fishing should look like that everyone, from hobbyists to guides to charter fishermen, can support. Some

of the motivations include fishing for sport, having an enjoyable experience on the water, catching fish to eat versus catch-and-release, or supporting customary or ceremonial needs. There was recognition of the importance for the recreational community to work together to develop a clearer vision of what “success” might look like.

Additionally, there was a common message from the speakers that participants in the management process needed to work to identify legal, policy, and process reforms that could help reconcile competing goals and objectives and promote collaboration and cooperation across sectors. Most importantly, there was a strong desire to promote greater trust and collaboration between scientists, managers, and fishing constituents.

Major Themes from the Discussion

Following the formal presentations, the speakers, panelists, and audience weighed in on a range of interrelated topics. The discussion raised several issues, revealed some best practices, identified gaps in socioeconomic data, and opportunities for improvement. These are summarized below as a series of short points. The observations do not necessarily reflect a consensus, nor are they listed in order of priority.

Recognize and Define Subsistence Fishing in the Magnuson-Stevens Act

There was general support for formal recognition and definition of subsistence fishing in the MSA by speakers, panelists, and the audience. How subsistence fishing should be defined needs further discussion, since it meant different

things to different participants. Subsistence fishing in indigenous communities, and motivations for engaging in it, was not the same as subsistence fishing for non-indigenous communities. It was described as incredibly valuable to communities for supporting cultural, customary, or ceremonial purposes and generally not for “profit,” but as a means of value-exchange in trades of goods for services.

In one example, a subsistence fisherman had recently received three requests for marlin for spring graduation parties. These 300-pound fish will feed hundreds of people. The fisherman did not plan to sell the fish, but will be providing it to the families. Next year, when he might need a load of dirt for his yard, he will get a load of dirt in exchange for sharing his fish. However, he might sell a fish occasionally to pay for fuel or tackle, so that he can continue fishing. This participant has been classified as “recreational” for the purposes of management plans. However, the Western Pacific Council has recently adopted the term “non-commercial” to distinguish this type of subsistence fishing from other recreational fishing. In other regions, subsistence fishermen may be fishing strictly for their own food.

One recommendation encouraged formal recognition of subsistence fishing in the MSA along with the caveat that Councils can operationally define what it means in their region. Another participant suggested the MSA should require subsistence fishing representation on Councils.

Expand Non-Market Values Research and Incorporation of Qualitative Information

Building on these discussions, a need was identified to quantify the value that fish may have for a community in a non-traditional way. A new term, “fish-flow,” was introduced and described as a research methodology recently devised to understand post-harvest distribution of fish and how fish flows through and is shared in a community on Western Pacific islands. Better understanding of the non-market value of such fish is important in any allocation discussion that might include subsistence fishing. However, it was also noted that beyond the Western Pacific region, it was difficult to identify any Council decisions that were based on qualitative information. The role of qualitative or descriptive information varies a lot between Science and Statistical Committees. Participants generally agreed that the MSA focuses on counting fish and dollars, and has continually expanded to involve more metrics through past reauthorizations. It provides limited focus on qualitative information and analysis, thus the issue was raised that its inclusion in a reauthorization should be considered.



Improve Recreational Data Collection

Although participants were aware of the improvements underway with the NOAA Marine Recreational Information Program, participants discussed the continuing need for improvements in recreational data collection, real-time data, and accountability. Dockside surveys do not adequately capture all angler effort. There was interest in improving information on fish caught and released, for example. Where data are used to monitor regulatory compliance, additional improvements are also needed since recreational quotas are still exceeded in certain fisheries. A few participants endorsed adopting regional strategies similar to requiring a duck stamp for hunters to collect better data on recreational catches of particularly popular or highly-regulated species, such as red snapper. Another example provided was the Angler Action program of the Snook Foundation in Florida. It is working with the Marine Recreational Information Program and the state of Florida to standardize data collection methodologies. Recreational fishermen are invited to log in to a web-based database to record trip and catch information, including relative sizes, numbers, locations, and if fish were harvested or released, explaining that the effort fills a critical data need in fishery management.

Overall, those discussing the topic felt that fishermen are open to reporting and helping to gather data, particularly when they understand and have confidence in how the data will be used. Additionally, there was overwhelming support and emphasis placed on cooperative research efforts for data collection.



Utilize More Cooperative Research and Other Collaborative Research Activities

Cooperative research efforts help empower fishermen and promote “buy-in” and better acceptance of the data used in stock assessments, models, and other assessments. Engaging fishermen directly in research efforts provides legitimacy and builds and strengthens trust between scientists, fishermen, and the managers who use the data.

Scientists can gain important information from the observations of fishermen who spend large amounts of time on the water. Additionally, many fishermen want to be able to review the data collected to ensure its quality. In Guam, fishermen were confused when they heard scientists report that princess snapper only reproduces at 7.0 pounds and during summer months. The fishermen catch princess snapper year-round, and had seen gonads in fish much smaller than 7.0 pounds; the smallest reported was 1.7 pounds. The fishermen asked the NOAA Fisheries Science Center to cooperate in data gathering efforts, and fishermen now collect weight, gonads and other measurements.

Off California, recreational charter captains work with scientists on acoustic and optical survey work. Cooperative research can be a cost-effective best practice that when planned correctly, has multiple benefits and can be replicated and expanded to other regions.

Promote Fisherman-to-Fisherman Cooperation

In addition to cooperative efforts between fishermen and scientists or fishermen and managers, several examples of fisherman-to-fisherman cooperation were noted by panelists and participants as exemplifying a best practice. The Gulf of Mexico Reef Fish Shareholders Alliance, a predominantly commercial fishing organization, had reached out to subsistence fishing communities such as the Gulig Gichi Tribe in South Carolina. They invited community members to meet Texas fishermen, exchange knowledge, learn from one another, and identify common objectives. In Alaska, a grant was obtained to investigate “compensated reallocation” as a way to engage willing sellers and buyers to shift allocation from the commercial sector to the recreational/charter sector. In this example, the charter industry was allowed to charge a small fee that goes to a common pool for recreational anglers to purchase limited amounts of halibut quota from commercial fishermen each year.

Risk pools for the West Coast groundfish fishery are another example of cooperation. Fishermen cooperate with each other and share in the risk to avoid hotspots of prohibited or undesired species. By avoiding bycatch, fishermen can continue fishing for target species. Working together, particularly across sectors, benefits local or regional fisheries, provides positive examples, builds bridges, and helps assuage the finger-pointing that persists between recreational and commercial fishermen.

It was also noted that opportunities for collaboration are the very reason it is important to have representatives from all fishing sectors—commercial, recreational, charter, and subsistence—sitting on the Regional Fishery Management Councils. If they are not on the Council itself, some other process needs to be identified to improve cooperation and communication, beyond social media and limited public testimony periods.

Tailor Management Strategies to Meet Sectors’ Needs

Managers need to use different tools to manage recreational fisheries. Since the motivations of each stakeholder group are different, identifying these goals earlier and more clearly while developing management measures will improve acceptance of management strategies. Participants noted that some methods used to manage freshwater fishing and hunting may also apply to saltwater fisheries. It was argued that to many recreational fishermen, maximizing fishing encounters is more important than maximizing yield—they go fishing if they expect to catch fish, and won’t if that expectation is not there. Several participants and speakers referred to the presentation by Dick Brame

in Session 1, Topic 1 (annual catch limit science and implementation issues) on this issue.

For fisheries that are primarily recreational or have a high value to recreational fishermen, Brame recommends managing to a fishing mortality rate and not absolute removals. This would be based on abundance and age structure, which maximizes encounters, not yield. Poundage-based annual catch limits are rooted in past harvests, and are not timely enough for recreational fishing, since fishermen respond to the current population abundance—as populations increase and fish become easier to catch, more anglers are drawn into the fishery and effort increases. This often causes overages to their quota and a “yo-yo” effect to the management regime, further frustrating anglers. Ideally, the management approach described by Brame would smooth out the data year to year and reduce wide swings. It would benefit from annual updates on relative fishing rates, similar to the annual surveys currently performed for waterfowl.

Provide Opportunities for Local Management at the Council Level

Examples of local fishermen’s engagement in fishery management demonstrated the advantages of improving fishing community sustainability. In one example, fishermen in the North Pacific recreational halibut fishery realized their industry would be better served, and could improve year-to-year management, if recreational fishermen from all areas were better engaged. This was done by developing a matrix of potential management options, and allowing the fishermen themselves to select the best way to restrict their harvest to stay within their allocation. Allowing industry to determine which reduction action would be workable was much more palatable than having others decide for them. Tribal fishery management was provided as a second example. Following the Boldt Decision in 1974, Northwest tribes were provided the right to co-manage their fisheries, particularly salmon, but also halibut, sablefish, shellfish, and other trawl species. Local management decision-making, working through the Council process, provides tribal fishermen the flexibility to shift fishing effort to take advantage of available species.



Re-set Allocations by Region with the Ability to Change Allocations as Needed

Overall, the recreational fishing participants in this session almost universally voiced a desire to see allocations of species quotas revisited with more regularity and based upon credible scientific data. There is not a one-size-fits-all means to conduct such reallocations, but audience members from the recreational community believed fresh economic data should be used and should consider the jobs that can be created per pound of fish available to be fished. Consensus was not reached on whether the charter industry should have its own allocation separate from the recreational allocation. There were regional differences of opinion on this issue. Participants from Alaska and many from the Gulf of Mexico region were generally opposed, while those from California voiced support for providing allocations for charter fishermen.

Continue to Improve Outreach and Engagement Between Managers, Scientists and Fishermen

The need for clear, honest, respectful talk and open communication between sectors, groups, Councils, and Federal managers was a recurring theme. Several times it was noted that there is significant value in fishermen engaging directly with other fishermen to share ideas and work toward solutions (see the examples in “Promote fisherman-to-fisherman cooperation,” above). Rather than policy administrators conducting outreach to fishermen, messages from plain-speaking people such as the conference guest speakers were seen as being more easily understood. Participants noted that “disconnects” happen but should be avoided. A NOAA recreational fisheries coordinator wanted to attend a big recreational fishing event in Anchorage, and to save costs, shared a booth with NOAA Enforcement. Unfortunately, attendance at their booth was low because of their association with Enforcement. Managers also need to be mindful of the timing of outreach and education efforts, which should not be scheduled during the height of a fishing season.



A 2006 PACIFIC FISHERY MANAGEMENT COUNCIL DECISION ON KLAMATH SALMON DRAWS A CROWD. PHOTO: PFMC



PAPERS

Session 3 Providing for Fishery Community Stability

Topic 2 Integrating Community Protection, Jobs Emphasis, and Seafood Quality Assurance

ELEMENTS OF FISHING COMMUNITY SUSTAINABILITY: LOCAL LESSONS FOR THE
NATION: ROBIN ALDEN

TOWARD HEALTHIER COMMUNITIES: LARRY BAND

DARDEN RESTAURANTS' SUSTAINABLE SEAFOOD VISION: ROGER BING

Elements of Fishing Community Sustainability: Local Lessons for the Nation

ROBIN ALDEN

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The Magnuson-Stevens Act, including the 2006 reauthorization that ushered in catch limits and accountability measures, has been hailed as the foundation for landmark fishery management accomplishments. National Oceanic and Atmospheric Administration (NOAA) has declared an end to overfishing, though the details show a more complex story. On a national scale, we have moved a substantial number of stocks from the “overfished” status to “no longer overfished.”



Something is wrong, however. Right now, many U.S. coastal fishermen and their fishing communities are in jeopardy, compromised by depleted resources within the range of their boats, consolidation caused by the monetizing of fishing rights, loss of voice in Federal management and inability to navigate the current Federal management regimes to gain adequate access to a diversity of species needed to sustain themselves over time.

This matters. It matters to the communities, many of which are rural and isolated, with few employment options. It matters to the seafood-consuming public, who increasingly ask who caught their fish, and where and how. The Act itself makes it clear that fishing community sustainability is part of Congress’s vision of the public interest for use of these public fisheries resources. In this paper, fishing community is defined as those geographical communities whose economies and livelihoods are dependent on fishing for the resources within small or day-boat reach of their harbors. The business strategy of these fishermen is not highly mobile; it is dependent on the specifics of their geography and is often highly diversified rather than specialized in one, more industrial scale fishery. In many cases, fishermen in these communities fish in both state and Federally-managed fisheries. And throughout the U.S., the nearshore waters where these communities fish contain the most important fisheries habitat in the nation. The problems in these coastal fishing communities are a bellwether.

The upcoming reauthorization of the Act provides a win-win opportunity to enhance the effectiveness of Federal fisheries management and at the same time establish a framework for sustainability for these communities. The Act should be amended to affect change in three areas. First, to change science guidance in the Act to require an ecosystem approach based on management of areas at multiple scales. Second, to establish Federal processes that permit accountable delegation and partnerships to give the Federal management system greater and more rapid feedback about resource conditions. The Federal system would thus become an adaptive, learning system with the capacity to be resilient in the face of climate change. Finally, to add coastal community fishermen as a vested constituency for participation in Federal management regardless of whether they are current active Federal permit holders. This would provide a way for the knowledge and observations of fishermen who fish high value coastal habitats to inform Federal decision-making. Much has changed over the last 40 years in marine ecology and in our understanding of complex systems and natural resource management. Integrating these advances into the Federal management structure would achieve improved fisheries conservation and create a constructive role for community fishermen in participatory management.

Fishing community problems, of course, are not limited to management-related issues. Many other factors besides availability of fish directly affect fishing profitability: energy prices, changes in the organization of the U.S. food system, national and regional economic events and changing demographics. The fundamental challenge for a coastal

fishing community is and will always be to prosper within the bounds of the resources nearby. As the ocean and markets and fuel prices change, business strategies must adapt as well, a process that occurs primarily in the private sector. Because fishing is based on a natural resource, the health of specific fisheries can be expected to fluctuate. As a result, a resilient coastal fishing business is one that has diverse fishing and market options. National Marine Fisheries Service's (NMFS) actions in both fisheries management and in business support programs should facilitate these businesses' capacity for ongoing adaptation.

Alternate Vision

This paper proposes that it is possible to actually *increase* the productivity of the nation's fisheries if the Federal system is able to empower local participation in monitoring and feedback into the system, supplementing the current Federal processes. Furthermore, it argues that, given what has been learned about marine ecology over the last 35 years, sustainable fishing will not be possible or feasible without this approach. The vision turns upside down the traditional trade-off that assumes fishing community sustainability requires lowered expectations for resource conservation. Instead, good conservation should become part of a community's long term plan for adaptation to a changing environment. Good conservation comes from good information, appropriate restraint, and appropriate and timely course correction. As we shift toward place-based, ecosystem management, this vision calls for creating a vital role in science and management for those fishermen who fish areas of the ocean that are critical to species productivity in order to enhance knowledge and decision-making for their fishery.



The nation is faced with a changing climate and a changing ocean. We are learning that single-species catch limits, alone, are not always enough for good conservation: that a shift into ecosystem management—taking care of places in the ocean—is warranted. Faced with change and additional complexity, we propose that the optimum approach for managers, fishermen and fishing communities is to learn collaboratively, in something close to real time. The NMFS Cooperative Research Program, which originated as merely a way to supplement fishermen's incomes, is the platform from which the collaborative learning and better scaled management can emerge.

This level of collaboration is difficult for many managers and fishermen to conceive of, given the zero-sum game that fisheries management has become over the last 35 years. However, in a changing climate and changing ocean, this is the only approach that is appropriate.

New Science Should Inform Magnuson Changes

When the Magnuson-Stevens Act was drafted in 1976, the drafters knew the ocean was complex but at the time, some good, linear approximations (Beverton and Holt 1957) were the best science available. The Act was built on the idea (maximum sustainable yield) that restricting or expanding fishing to the correct catch limits was the key to the future health of fish stocks. Since the reauthorization in 2006, most Federally-managed fisheries are now managed with catch limits based on Federal stock assessments. But now it is recognized that catch limits, set at large, regional scales, are not enough and may, as in cases like Atlantic cod, inadvertently create incentives for serial depletions of localized spawning components and collapse (Wilson et al. 2012). Furthermore, many forces besides fishing effort affect fish stock size and as climate change becomes visible, scientific guidance is now to “expect the unexpected.”

In the years since Magnuson, marine science has revealed a level of previously unimagined complexity in ocean ecology. We have learned that some marine fish populations have natal homing comparable to birds and anadromous fish (Thorrold et al. 2001). Instead of existing as regional-scale, panmictic stocks, we have learned that populations of the iconic and well-studied Atlantic cod have morphometric differences on different reefs (Sherwood and Grabowski 2010) and a quite localized meta-population structure (Ames 1997, 2004). This complexity extends throughout the marine ecosystem. We understand, now, that many anadromous fish are genetically distinct in each river, and in many tributaries. And we are learning that bivalves, like Atlantic sea scallops on the coast of Maine, have genetic diversity at a scale unimagined even 10 years ago. Maine's tiny, 14-square-mile Gouldsboro Bay has scallops

that are genetically distinct from those outside the bay (Owen and Rawson 2013). That is a distinct population in an area bounded by just 16 miles of Maine's heavily indented 3,500 miles of coastline.

The New England Atlantic cod fishery is a cautionary example of what can happen inadvertently when the scale of management does not match the ecological scale at which the species exists. The pain of fishing communities is heard clearly in the Northeast Region, where we just recently discovered that our iconic cod stocks are in terrible shape, despite two decades of increasingly stringent limited access and most recently, quota management. Gulf of Maine cod is only 20 percent of its target biomass, and managers now realize was fished at a rate five times higher than the overfishing threshold. This occurred at least in part due to the fact that management didn't take into account the species' complex stock structure. The cod assessment is done for the whole Gulf of Maine, an area from Cape Cod to Canada, from which catch limits are set.



However, in 2004, Ames published a seminal paper based on historical fishermen's data that described four distinct population subgroups of cod in the Gulf, each with separate migration corridors and distinct areas for reproduction and juvenile stages rather than one, Gulf-wide population as had been previously assumed. At that time, the two easternmost cod groups had collapsed. Viewed at a Gulf of Maine-wide scale, this localized depletion was invisible because there was still cod in other parts of the Gulf of Maine. Fishing continued in the southern and western part of the Gulf and tragically, it now appears that the same localized depletion continued, also undetected. By 2010 over 50 percent of the cod catch in the Gulf of Maine came from an area less than one percent of the size of the Gulf and in the end, the assessment showed a complete stock collapse. It appears that because

catch limits were set at the wrong, too-large, Gulf of Maine wide scale, fishermen who were fishing within quota and following the rational fishing strategy of fishing where the fish were, pulse fished each sub-stock sequentially, taking out the remaining productive sub-units one by one. It was too late by the time that loss of productivity and the risk was recognized in the Gulf-wide assessment (Armstrong et al. 2011).

Governance Implications of Ecological Complexity

Such ecological complexity presents staggering management challenges. To meet the challenge will require additional, more decentralized layers of governance, a shift to ecosystem rather than single-species science, and creating of a more adaptive management process. Coastal fishing communities can play a pivotal role in making these changes feasible.

Viewed through the lens of a regional Science Center or Council, it is inconceivable to try to manage the marine ecosystem's complexity effectively. However, for guidance we should gain insight from the theory of complex adaptive systems developed over the last 40 years for a variety of applications including governance of natural resources worldwide (Simon 1962; Ostrom 1991; Ostrom and Janssen 2004). This literature indicates that management of such complex systems cannot be done effectively only from a single, high level but instead must be accomplished through a series of nested hierarchies. Translated to U.S. fisheries, the implication is that the current Council and Science Center system must be augmented with finer-scale information and credible feedback loops to provide information at the proper scale. In this way, management can be aligned with the ecological scales of the resources being managed, just as the decision to plow streets is made at a municipal level, not at a state or Federal level, so as to align snow plowing with local microclimates. For snow plowing, this works and does not negate the need for statewide, regional and national transportation planning as well. In fisheries, this need for multiple levels of decision-making is recognized but, we now realize, is not fully accomplished through the regional structures created by the Act.

The ecological complexity also necessitates updating the scientific structure embodied in the Act from one founded on maximum sustainable yield (MSY) to an ecosystem approach based on the ongoing need to learn adaptively, at multiple scales. As part of this, National Standard 3 should be revised to reflect current scientific understanding of the importance of managing fisheries with metapopulation structures to protect individual sub-units in order to protect the productivity of the entire population. The fact is, as the ocean changes with climate change, even NMFS' best assessments, with long time series, may not be able to provide appropriate advice. In this context, it is constructive to view most fisheries as data-poor.

In a data-poor situation, the sensible management response is to shift from the static situation we are in now, where NMFS is meant to have all the answers, to an ongoing process of feedback, learning and adaptation that is collaborative, enlisting the multiple platforms and intimate fine-scale observations of fishermen. NMFS' Cooperative Research Program has started to serve this function. There is literature documenting key elements for successful local involvement in fisheries governance (Gutierrez et al. 2011). And adaptive management structures for other Federal natural resources such as forestry and fish and wildlife can provide perspective on the appropriate legal frameworks to encourage or require NMFS to partner with states, the industry, and/or non-profit organizations in piloting and assessing multi-scale, adaptive management.

State Examples

States provide a useful laboratory of fisheries governance models worth examining in the quest for a more collaborative, decentralized, and accountable Federal approach. Most states don't have the financial resources for rigorous surveys and assessments so many states manage their fisheries essentially as data-poor fisheries, without the possibility of leading with assessment-based catch limits. State approaches that have evolved in these conditions contain two elements: 1) some level of localized governance and 2) active, uncompensated participation in data collection and stewardship activities. In each case, the state has realized more value from the fishery than they would have had they managed at a statewide scale. These models are instructive because they illustrate how localized management can provide for better resource stewardship, allowing the states to realize more benefit from their marine resources, a different view of optimum yield.

Many states, including California with urchins or Maine with softshell clams, have enlisted fishermen and even municipalities in localized science and management. Maine, faced with a lack of resources to enforce thousands of square miles of clam flats along its 3000 mile coast, developed a process to delegate authority and responsibility to municipal clam conservation committees. Accountable to the state, the towns raise funds, hire clam wardens, and tie access rights to dig clams to clam flat assessments and participation in reseeding efforts. Access to dig clams in a town requires both state and local licenses, a nested hierarchy.

Maine's lobster fishery is the most well-documented and successful example of a fishery that is managed the way many data-poor fisheries are, with emphasis on ecological measures plus a combination of traditional and state-sanctioned local authority. After a complete collapse in the 1930s, the lobster fishery was rebuilt based on rules negotiated between the fishermen and state regulators. All of them are ecologically based, such as protecting habitat (traps only), protecting reproduction (returning egged lobsters to the ocean, maximum size to protect large breeders, and v-notching), and protecting juveniles (minimum size, vents.) Rebuilding took place without limited entry or quotas.

In the mid-1990s, additional lobster regulations were added: owner-operator rules, an apprentice-based entry control, trap limits and elected co-management based in seven zones. The reason those rules were able to make it through the Legislature was because they created an additional layer of co-management, the zone structure, that recognized the ecological and socioeconomic differences within the state, and thus within the industry. The zones continue to provide an appropriate geographic/ecological scale for decision-making about the fishery, particularly notable as temperature regimes change in different parts of the coast.

Scallops

Sea scallops in Maine are an example of another, evolving nested hierarchy. Scallops outside state waters are managed by the New England Fishery Management Council, with rules written at a New England-wide scale. Maine manages scallops in its territorial waters, a highly productive area. Scallops are important to coastal communities as a part-time winter fishery for lobster fishermen fishing in 30-45' boats. Faced with a depleted resource, overfished by mobile scalloping that have pulse fished the resource travelling coast-wide to places of abundance. Recently, Maine started a scallop management process that is further decentralizing its statewide management to an ecological scale and providing a framework for ongoing learning and industry participation. The resource is patchy and Maine's scallop survey can, at most, provide an indicator of localized abundance. The ecology of the state's many bays differ and



recent science show genetic differences occur at a stunningly local level, even bay-by-bay.

Since 2010 the Maine Dept. of Marine Resources (DMR) and fishermen, together and independently, have discussed strategies for how to open thirteen areas that had been closed to help rebuild the neglected and depleted fishery. An unprecedented 88 scallop fishermen's meetings have taken place. The discussions started with values: do you want to be able to fish near home or travel statewide? And tough questions: How do we avoid wiping out good sets in one season? And science: Did scallops rebuild in the closed areas? Can fishermen ride the state scallop survey boat? How fast do scallops grow? A local non-profit started these, meeting locally, and then DMR continued, meeting at the same local scale (Brewer 2013).



State managers heard and responded to fishermen's reservations about creating a one-size-fits-all plan for re-opening the closed areas as limited access areas. Several industry suggestions for flexible management were adopted by the DMR in a long-term scallop management plan. These included the concepts of rotational management, the use of real-time catch rate measurement to trigger the Commissioner's use of his emergency authority to close an area, and recognition of the geographic differences in fleet behavior and the scallop resource along the coast. Instructively, the recognition of geographic/ecological differences has facilitated understanding among fishermen and with managers because the areas they are discussing are appropriate to the patchiness of the scallop resource along Maine's rocky bottom. This has facilitated collective interpretation of information about resource conditions.

The result—dynamic, in-season closure decisions supported by fishermen's information about catch rates; concerted work by DMR Marine Patrol, sea samplers, scientists and managers. And constant communication between fishermen and DMR: emails, phone calls and texts, not shirking from what it takes, and in the end, learning together, establishing some trust, and getting value from the resource without huge mistakes. The season was a huge achievement. However, the true reward is the development of a collective process toward rebuilding and sustaining the resource. It has deliberately built trust and a learning process that is ongoing and has the potential to build a common understanding of conditions and uncertainty. This is the first year of the new process. Already local fishermen are speaking about developing local stewardship groups that could take on additional responsibilities to enhance the process. The fishermen who live nearby want to work with the state to ensure that, to the extent possible, they can depend on a winter scallop fishery accessible from their harbor.

Applying State Lessons in the Magnuson Environment

The state examples provide an example of the power of coastal fishing community involvement stewardship. Key lessons and recommendations emerge to apply these insights in the Federal, Magnuson environment and create a legal pathway that links the Federal management structure to that local capacity. State experience suggests that once Federal scientists and managers have the ability to work at a local, appropriate ecological scale, mutual learning and understanding will develop that will both advance fisheries science and improve management.

- Scientific guidance in the Act should make the transition from maximum sustainable yield-based concepts to ecosystem concepts. This would allow Federal management to build upon catch levels with stewardship of multiple parameters of the areas and the ecological aspects (size, reproductive behavior, etc.) of the resources within them.
- National Standard 3 should be revised to reflect current scientific understanding of the importance of managing fisheries with metapopulation structures to protect individual sub-units in order to protect the productivity of the entire population.
- Protection of high productivity areas should be prioritized for Federal waters management. With the exception of some offshore banks and atolls that have the same ecological functions, the majority of the reproductive capacity for the nation's fisheries occurs in nearshore areas. These areas warrant additional rules to protect their productivity and a process whereby their complexity becomes better understood. These are the areas, like the cod areas that were depleted in the Gulf of Maine, where localized information and feedback loops can result in better conservation and ultimately far more

resources for the industry to catch on a sustainable basis.

- Create a new legal framework for the stewardship of highly productive nearshore areas. This framework would provide the ability for NMFS to engage in partnerships with states, community fishing groups or non-profits entities for enhanced management of the areas. This could include monitoring, providing an authentic pathway for advice about local ecological conditions and proposing ecologically-based measures that would fit within the Federal catch share management. The system would have two-way accountability. These partnerships would function within the region-wide management structure, would franchise a broad range of fishing community members in supporting stewardship and, because of the ecological significance of these areas, are likely to enhance abundance to the benefit of both the community-scale and industrial fisheries.

Coastal fishing communities depend on the health of the marine place where they work. It is in the national interest to facilitate and expect their participation in stewardship of that place. The reward will be community resilience and improved management results for all Federal fisheries.

Access Rights

To be successful, a coastal fishing community not only needs abundant resources nearby; fishermen also need the access rights to fish those resources. The importance of access for fishermen's livelihoods is well understood. However, access performs an important second function in the new context of multiple scale, ecosystem management: access rights actually create a constituency for the resource and a cadre of fishermen to participate in stewardship activities. This becomes even clearer in the context of place-specific ecosystem management. If fishermen are to be enlisted in the stewardship of an area, then access systems need to provide them the hope of being able to fish the resources they are contributing to caring for or rebuilding.

Many of the current problems facing U.S. coastal communities stem in part from allocation decisions that favored full-time, single fishery operators or were based on time periods when those communities faced local depletions. The result has been a steady erosion of opportunities for fishermen whose business plan and community is built on being able to shift among resources as local abundance changes. A policy solution to this is essential if U.S. coastal fishing communities are to survive.

Coastal fishermen's access needs differ from those of more specialized, offshore boats, a fact that has not been accommodated in most Federal access systems. For a coastal fisherman, whose business strategy is to fish whatever resources are within reach of the harbor in a relatively small boat, affordable access rights to diverse fisheries are critical to sustainability. Access for a coastal fisherman is distinct both qualitatively and quantitatively, a fact that many permit systems do not take into account. A coastal fisherman is likely to use access rights to a given fishery either part time, as part of an annual round of fisheries, or at different times during his/her life. Sometimes, this light use leads managers to misinterpret its significance to fishermen's financial stability. In other cases, managers view such permits as a dangerous latent or partially latent version of a full-time, offshore, specialized unit of effort. In fact, fishing community stability would be greatly enhanced if permit systems recognized these differences. Repeatedly, advice from coastal fishermen is that affordable and diverse access rights, even if severely limited as to time, gear, trip limit and area, are the linchpin of their family and community economies. Fishermen want future generations of young fishermen to be able to enter the fishery affordably so that they, too, can fish at a community-scale.

Finally, as climate changes, species distribution will change. Access systems for coastal fishermen need to be structured to adjust as well, most likely through some area access structure. If such adjustment is not possible in a manner accessible and affordable to coastal fishing, it will force coastal fishermen who fish one locale to change their strategy and either join the mobile fleet or go out of business.





Other Models

Again, innovations from non-Federal jurisdictions can provide a useful laboratory for alternate access concepts.

Permit Banking and New Entrants

Because groundfish off the state of Maine collapsed years ago, very few Federal rights to fish for groundfish are left in the state. Three nonprofits and the state of Maine are involved in permit banking, buying permits of retiring fishermen in order to accumulate quota that can be used by the few remaining active fishermen in the state.

One permit bank is paired with a program specifically targeting coastal fishermen who want to participate in the groundfish fishery on a seasonal or part time basis. A New Entrants Program is designed to help coastal fishermen enter the groundfish fishery through business planning and a website that serves as a connector between older fishermen who hold permits with no quota and young people who want to enter using quota from one of the permit banks. The program is specifically designed to rebuild participation in groundfish on a sustainable basis. Participants must be owner operators and must fish with hooks or traps. Existing young fishermen, currently fishing other fisheries such as lobster, who are looking to diversify into groundfish on a part-time basis are the target audience, and the program is linking collaborative fish trap gear development with participants.

currently fishing other fisheries such as lobster, who are looking to diversify into groundfish on a part-time basis are the target audience, and the program is linking collaborative fish trap gear development with participants.

Licensing for the Future

A licensing initiative in Maine is tackling the challenge of designing a fisheries access approach that would provide coastal fishermen with a diversified portfolio of fisheries and that could be adaptive to changing climate. Maine currently licenses fishermen, not boats. No licenses are transferable and some fisheries are closed. Some fisheries require apprenticeship (lobster) or courses (dive fisheries.) Penobscot East Resource Center and Maine Sea Grant are collaborating on the project that started with outreach to the industry to solicit values and has held a workshop that attracted New England state fishery managers and social scientists from both coasts of North America. Several important concepts emerged.

- The importance of owner-operator to the sustainability of community-scale fishing. Coastal fishermen and managers from several states and Canada identify owner-operator or owner-on-board as the most highly effective method for regulating scale in nearshore fisheries. The rules inhibit consolidation and ground the access rights within the fishing community, as well as providing a generational link to the health of the local resources. Owner-operator rules work in both transferable and nontransferable systems.
- A goal of one single “fisherman” license with entry to specific fisheries achieved through endorsements. This concept fits within the idea of area-specific ecosystem management and would effectively identify a cohort of local coastal fishermen and allow their access to specific species to ebb and flow based on the status of those resources.
- The irreversibility of transferability and associated challenges it poses to fleet diversity. Maine has no transferability, and managers from Canada and Alaska identified this as an opportunity for Maine to create a new model since it is difficult to innovate once the access is privatized.
- The dangers of entitlement thinking. It is easy for the fishermen currently engaged in a fishery to feel entitled, rather than understanding that they are using a public resource. In turn, government entities tend to become captive to the interests of current active fishermen.
- A goal to design a system that would link fishing privileges with stewardship behavior, including participation in monitoring and management processes, as well as a clean enforcement record. This approach has the potential to fit well with the need for changing access in a changing ocean. It could be used to for a fisherman to qualify for endorsements in a system with one permit or license, and additional with endorsements.

Maintaining Standing in the Management Environment

The largest challenge to addressing coastal fishing community access problems lies in the degree to which the current Federal system has limited participation to those who are active, Federally-permitted fishermen—the issue of entitlement raised above. As many fisheries have consolidated under Federal management, coastal fishermen who have lost their rights to a fishery no longer have standing in everything from limited access privilege program referenda to their comments being taken seriously at a Council meeting. The Act heavily favors “active fishermen” in the Council appointment process and aspects of fishery management plans. Most fishermen who have lost access rights drop out of the Federal management process.

However, as the nation transitions to ecosystem management where care of marine place is the goal, the law should be modified to create a vehicle for fishermen in coastal communities in that area to gain both standing in the management process and responsibility for participation in decentralized science and management. If this is not achieved, the management system will lose the observations, historical perspective and commitment to place that are possible in a resident fleet. One example of this can be seen in the New England cod story. Throughout the 20-year process of cod depletion in New England, coastal fishermen who fished the nearshore grounds where fish return to reproduce spoke up about the loss of fish, first in eastern Maine, then in mid-coast Maine, then in southern Maine and New Hampshire. In each case, because their observations could not be validated at the Gulf-wide scale, the system could not integrate these important warnings into management guidance. In each case, mobile boats did not perceive the significance of the depletion because they could move to follow pulses of abundance. As each set of coastal fishermen lost their fish and stopped groundfishing, those fishermen lost their standing in the Federal system. Their observations and passion for rebuilding those resources were lost from the system.

Changing this, however, is a challenge given the degree to which remaining fishermen are vested and coastal fishermen are not. It is unlikely that this process will be reversed without changes in Magnuson. Instead of viewing this as an allocation wrong to be righted, the changes in Act that should approach this issue as part of establishing a legal structure that will allow ecosystem management to be implemented successfully. Coastal fishermen, commercial, recreational and subsistence fishermen have a role to play that cannot be filled by any other group.

Summary Framework for Coastal Fishing Community Sustainability

The following points lay out critical elements for a policy agenda to secure fishing community sustainability:

1. Fishing communities need abundant and diverse resources—no fish means no fishermen.
 - New science about the complexity of the ocean, combined with uncertainty caused by climate change, creates the need to further develop Federal management policy with multi-scale management and place-based, ecosystem approaches.
 - These systems need to be adaptive, providing rapid, responsive feedback from the field in close to real time, so that good and timely management decisions can be made in a changing ocean.
 - Coastal fishermen have a primary role to play in supporting stewardship and adaptive management of nearshore Federal waters, providing timely information and a critical feedback loop about local conditions in productive areas.
2. Coastal fishermen need access rights to fish for diverse resources at constrained scales, and they need the ability to adapt to changing local resource availability.



- Access issues are different for coastal fishermen than they are for specialized, industrial fishery vessels. Their strategy of lower volume, localized fishing requires access to diverse fisheries. Access for coastal fishermen needs to be affordable and adaptive especially as climate changes.
 - Many coastal fishermen are currently predominantly dependent on state fisheries because of the initial allocations of permits and the expense of buying in. Fishing communities need a mix of access to state and Federal fisheries.
 - Owner operator rules are widely viewed as critical in preserving fishing at a community scale.
3. Fishermen need multiple paths to economic sustainability for themselves and their communities because small-scale fishing strategies require diversity.
 - Small-scale shellfish and seaweed aquaculture can supplement wild fishery income effectively, but only if rules are sufficient to keep aquaculture small-scale. If not, it could supplant wild fishery options and produce the adverse ecological impacts of monoculture, a less resilient ecological and economic situation.
 - Food system innovations that return higher prices for local and sustainable catches will play a significant role in community sustainability and will produce support for fishing among the general public.
 - Given the intensely local ecology of so many marine species, national sustainability certification efforts should establish a structure to support certification of highly local resources as is done for French champagne rather than attempting to certify at a regional or national scale.

Summary Magnuson Reauthorization and NMFS Policy Suggestions

1. Revise National Standard 3 to reflect current scientific understanding of the importance of managing fisheries with metapopulation structures to protect individual sub-units in order to protect the productivity of the entire population.
2. Revise fishery management plan guidance to require participation and input from non-Federally permitted coastal fishermen (commercial, recreational, subsistence) from communities adjacent to ecosystem management areas, not limited to Federal permit holders.
3. Create a legal framework for adaptive management of nearshore areas that functions within the region-wide management structure:
 - Encourage/require NMFS to engage in partnerships with states, community fishing groups or non-profits entities for enhanced management of the fine-scale ecology of the areas including monitoring, providing advice about local ecological conditions and proposing ecologically-based measures that would fit within the Federal catch share management;
 - Create a mechanism to create a new form of Federal access right for specific high productivity nearshore areas. These rights would be severely constrained: limited to that specific area, to owner-operator vessels, to use of habitat friendly gear, to appropriate catch limits, and most importantly, to participation in stewardship.
 - Two-way accountability;
4. Create provision for both NMFS-led and Council-led pilot projects so that the pace of learning and management innovation is increased.
5. Re-examine the opportunities for participation in the Federal process for coastal fishermen who identify holistically as fishermen, rather than with just one single-species fishery. For coastal fishing to continue, these fishermen need a seat at the table. Areas to examine include Council membership, qualifications for participation in limited access privilege program referenda and Regional Fishery Associations, and Coun-

cial decision-making about creation and management of any decentralized areas or ecosystem-based management mechanisms.

Conclusion

For fishing communities, these changes are not optional. Conservation, and the desired increased sustainable supply of fish for coastal communities, is only possible if there is a mechanism in the Federal system to use local knowledge in additional layers of decentralized management. No matter how draconian any curtailment of effort is, continued single species at a broad scale cannot get the incentives right because it doesn't get the biology right.

Coastal fishing communities cannot and should not be preserved like museum pieces. Instead, as the nation transitions to ecosystem management and as we all cope with a more rapidly changing ocean, the Act should be modified to structure shared, adaptive responsibility for stewardship of critical nearshore places in the ocean. Fishermen have a critical role to play in the feedback loops we need for good governance. The pay-off will be abundance, community well-being, and local supplies of high quality fish that cannot be achieved any other way.



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Toward Healthier Communities

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Introduction

The Magnuson-Stevens Act charges the National Oceanic and Atmospheric Administration (NOAA) and Regional Fishery Management Councils with simultaneously conserving the country's living marine resources and providing for communities' sustained participation in fisheries. While some view these joint responsibilities to conservation and communities as conflicting, they are not.

The most important factor in sustaining our nation's fishing communities and the businesses that support them is to create a stable management system that allows for a stable and healthy fish resource. This creates the best opportunity for a commercial fishery that is more predictable, more profitable, generates better paying and more stable jobs, and may slow the rate of fleet consolidation.

Stability is most likely to come in fisheries managed by annual catch limits, strong accountability measures, and limited fishery access controlled through a privilege system. With these management measures in place, fishing businesses can focus on creating financial and community value through more efficient, less wasteful fishing practices that produce higher quality product better timed to market demand. Recovery of fishing stocks becomes more important as a long run source of improvement rather than an immediate need for community and business benefit.

Those who see conflict between community and conservation outcomes argue that stock rebuilding measures result in more rapid consolidation of the fishing fleet, disproportionately negative impacts on small-scale fishing businesses, and greater difficulty for new entrants to establish themselves in the fishery.

It is not clear that these arguments have been or can be empirically supported. They are particularly difficult to assess given the challenge of establishing a baseline against which to evaluate the changes. Most often changes in fleet structure are compared to history. But there is little agreement on what period of history is relevant or whether it is relevant at all.

Problem and Approach

While any long-term negative impacts of stock rebuilding strategies on fishing communities are uncertain, there is more clarity on a variety of transitional issues that can arise, especially in fisheries that begin the reform process with weak fish stocks. Fishing is a risky, challenging business with or without the added uncertainty of management reform. Even when reform efforts lead to a more stable fishery with more profitable businesses, it creates a transition period during which old commercial patterns and business practices need to change.

To adapt, businesses and entire communities must expend resources to evolve. The challenge of adapting can be greater for smaller-scale fishing operations and smaller communities because they have fewer resources available to them.

To address this challenge, the National Marine Fisheries Service (NMFS) and Councils, without compromising their stock rebuilding objectives, should focus on reducing sources of operational uncertainty and expense for fisher-



men and facilitate access to scarce resources important to their adapting to change. More specifically, actions should fall into three broad categories:

1. Lower the cost of management programs for the fishing industry
2. Provide smaller-scale operators with better access to critical resources for the development of successful fishing businesses (including investment capital; technical assistance to support business planning as well as operations, marketing and financial management; accurate and timely catch accounting and quota transaction data)
3. Promote innovation and entrepreneurship in the management process by engaging industry and third parties more fully in design, development and operations

Lower Cost of New Management Systems

Fishing businesses generally operate with significant economies of scale. Larger businesses can spread their costs over a much larger business base, giving them a potential competitive advantage compared to smaller businesses.

In fisheries undergoing management reform where stocks are stabilizing and especially where limited access privileges exist, businesses look for ways to gain greater economies of scale to increase profits and business strength. This may include seeking opportunities to land more fish per vessel. Or it may mean looking for ways to collect and use more information about what is happening on the water to plan more efficient fishing trips. In the case of multi-species fisheries, it may mean having access to additional quota for scarce, constraining stocks. And it may mean scaling the business to better handle new management costs associated with catch accounting and trip monitoring.



Importance of Community Fishing Associations

Most often, businesses seek economies of scale through consolidation; one fish harvesting business acquires another, or acquires critical fishing assets such as permits, quota or privileges. Community Fishing Associations (CFAs), alliances or cooperatives can represent a viable alternative to outright consolidation for smaller-scale fishermen to generate economies of scale and pool resources to make the necessary investments to upgrade operations and potentially purchase additional access privileges.

However, CFAs often struggle to establish themselves. Barriers include fishery management rules that make formation and operation of cooperatives time-

consuming, complicated and expensive; lack of organizational and management capacity in fishing communities; and lack of experience in functional areas including marketing and finance.

Despite these challenges, there are good examples of different types of cooperative organizations that have formed to help communities of smaller fishermen capture the benefits of scale without accelerating consolidation. These include the Alaskan cooperatives, Central Coast Sustainable Groundfish Association, Fort Bragg Groundfish Association, Gulf of Mexico Reef Fish Shareholders' Alliance, and the Cape Cod Fisheries Trust.

In designing new management plans, NMFS and the Councils should work to facilitate the smooth formation of CFAs where fishermen want to come together voluntarily. Ideally these cooperatives will become partners with the agency to define the most appropriate community goals for the area they represent, and design and implement programs that will achieve them.

Controlling Monitoring Costs

Requirements for monitoring and reporting on fishing activity have increased significantly as management plans have adopted more rigorous annual catch limits and accountability measures. The cost of meeting these requirements has also increased, for both NMFS and the fishing fleet.

Monitoring costs, and in particular human observer costs (either currently or prospectively), represent the largest single management-related cost for fishermen. These costs are proportionately more onerous to small operators who have to support a comparable cost burden with lower catch levels than larger operators.

One of the more valuable steps NMFS and the Councils could take to improve the viability of the small-scale fleet is to encourage development and usage of lower cost monitoring programs. Not only would this improve the profitability of fishing businesses, it would allow a much higher portion of partially covered fisheries to be monitored, increasing overall fishery accountability.

Substantial work has been done recently by NMFS and a variety of industry, nongovernmental and academic collaborators to explore the ability of electronic monitoring and reporting systems to deliver more cost-effective monitoring solutions. While the conclusions vary somewhat fishery to fishery, and it is unlikely that a wholesale replacement of conventional monitoring with electronic monitoring will be the answer, electronic systems should be able to reduce the monitoring costs for the fishing fleet overall and will likely reduce the cost disadvantage of small-scale operators.

Access to Critical Resources for Communities

Cost-Effective Capital

As mentioned above, management reform forces fishing businesses to compete differently to be successful. This often means making investments to upgrade operations. Fishermen may purchase new vessels or refurbish existing ones, switch gear, acquire permits or quota, or upgrade fish handling equipment. Shore-side businesses including offloaders and processors may purchase new trucks, hoists, ice machines and freezers or require additional working capital to support higher revenues and payment to fishermen on better terms.

Many businesses, especially smaller ones, struggle to find the money needed for these critical investments. There are several steps that should be taken to improve the chances that businesses find the capital they require.

Establish a Central Registry

As part of Magnuson-Stevens Act reauthorization, Congress directed NMFS to establish an exclusive central registry system to facilitate lending to fishermen based on the security of fishing permits and privileges. This was never carried out.

A registry is an exclusive system for perfecting title to, and security interests in, fishing permits and privileges. Having a well-functioning registry is critical to making conventional lenders comfortable with taking fishing permits and privileges as collateral for loans. And for fishermen, their permits and privileges, especially in well-managed fisheries, are often their most valuable business assets and therefore their greatest source of collateral for borrowings.

From both a lender and borrower perspective, NMFS should move forward with establishing a registry. This is one of the more important steps to making conventional bank loans available to a broader group of fishing businesses.

Involve Established Lenders in Management Reform Process

As important as capital can be to a successful management reform process, NMFS and the Councils should make a greater effort to engage lenders in the design and implementation of fishery reform.

At a minimum, more lender involvement in the process would give lenders a better understanding of the operational aspects of a fishery management plan, as well as its potential risks and rewards. This information is critical to a lender's credit analysis and, therefore, their willingness to lend to the fishery.



Further, lenders may have input on design features of the management system that would better allow them to manage risk if they were to lend. An example from the Pacific Groundfish Individual Fishing Quota (IFQ) program is lenders' efforts to get an exemption from the control cap, allowing them to take quota in excess of the control cap as collateral for their portfolio of loans. This issue is important to lenders as they need to manage a loan portfolio that is large enough to diversify their investment risk and cover the costs of doing business.

Support Loan Programs for Smaller-Scale Borrowers

Even for experienced fishery lenders, meeting the needs of small-scale businesses and especially new entrants can be difficult. These borrowers typically lack the well-documented operating history necessary for loans, and have not built long-term relationships with lenders. As a result, it can be difficult for them to get the loans they need to improve their businesses.



Dedicated fishery loan programs can play an important role in filling this void. To be successful, these programs must be well structured with clear goals, a well-targeted base of borrowers, and loan products that match the needs of those borrowers. These funds are also most successful when they position themselves as a transitional source of capital, targeting borrowers who will eventually graduate to accessing commercial loans.

Good examples of this type of funding include NOAA's Fisheries Finance Program (FFP) and the California Fisheries Fund (CFF). The NOAA program, administered by NMFS, provides financing for quota purchases as well as vessel purchases, vessel reconstruction and shore side fishery and aquaculture facilities. Under the FFP, IFQ financing may be available for quota purchases at the request of the Regional Fishery Management Councils.

The program finances up to 80 percent of the cost of purchasing quota by small vessel operators and first-time quota buyers. IFQ funds have been successfully used in the Alaskan halibut and sablefish fishery and the Bering Sea crab fishery.

The CFF is a dedicated fisheries fund capitalized by the State of California and several private foundations. It makes loans to community fishermen and fishing businesses in California, Oregon and Washington to help them succeed in fisheries undergoing management reform. Loans have been used by fishermen for vessel purchases and upgrades, gear switching and permit purchases; and by processors and offloaders for infrastructure improvements and working capital. Both the FFP's IFQ Loan Programs and CFF are useful models that should be replicated in other regions throughout the U.S.

There is also the potential to better use other existing government loan and guarantee programs including those offered by the Small Business Administration or model new programs based on successes in affordable home and U.S. Department of Agriculture lending. This is an area worth further exploration.

Technical Assistance

In adapting to the changing business landscape, fishing businesses need more than money. They often need deeper business and management skills to run viable and profitable operations. These skills may include business planning, data collection and management, quota management, product marketing and fund raising. Fishing communities looking to form and run CFAs often need assistance with organizational development and governance, leadership training, strategic planning, resource management and fund raising.

These skills and expertise can be in short supply, especially in smaller communities, and can be difficult and expensive to acquire. While the success of NMFS in fulfilling many of its MSA objectives depends on the development of these skills and expertise, NMFS is not well positioned to provide them directly. However, government, as well as private foundation grants, can be critical to facilitating the development of these skills and expertise.

NOAA grants through the Saltonstall-Kennedy grant program and Commerce Economic Development Administration or other government Community Development grants have been mentioned as Federal sources of seed

money that may be scaled to meet this need.¹

National Fish and Wildlife Foundation's Fishery Innovation Fund is a grant program designed to foster innovation in the fishing industry through priorities including community capacity-building. It is an example of an organization with a strong track record of supporting technical assistance programs, and particularly those that benefit CFAs.

Grants provided through a wide range of public and private sources have helped build a growing group of organizations with fishery expertise that work closely with the fishing industry. These include Amplifier Strategies, CapLog Group, CEI, Community Fisheries Network, Future for Fish, Gulf of Maine Research Institute, and Lisa Wise Consulting, among others.

NMFS and the Councils should continue to promote the involvement of non-profit organizations, private companies and industry leaders in providing needed technical assistance to communities. Further, the agency should facilitate access to expertise in finance and business and incorporate these issues early in the process of designing new management plans.

Timely, Quality Information

Access to information, both fishery-independent and fishery-dependent, is critical to NMFS and the Councils for designing and implementing fishery management plans. It is also critical to the fishing industry: to be compliant with management rules, but more importantly, to run efficient and profitable businesses.

Data requirements have increased significantly over time with the increasing sophistication of management plans, more data-driven annual catch limit setting procedures, and greater accountability measures. And NMFS faces significant and expected challenges collecting, warehousing, integrating, analyzing and reporting on this ever-growing pool of data.



Timely access to quality information is critical for fishermen to succeed, especially in catch share fisheries. This is particularly important for smaller-scale fishermen who have fewer resources both to collect third-party information and to absorb the risks that come from poor decisions made with no data or poor quality data.

One example of this is the potentially long lag between when a fisherman records his catch in his logbook and when that information is reflected in his vessel account. During this interim period, it is difficult for the fisherman to plan future fishing trips, not knowing how much fish he has left to catch in that fishing season. Another example is the lack of detailed and current reporting on the market for quota leases and sales. Without this information, it is difficult for fishermen to make intelligent decisions on when to buy and sell in these markets and at what price.

Improving data management should be a priority for NMFS. Keeping costs manageable, both for NMFS and the fishing industry, should be one important objective (as discussed above regarding monitoring and reporting) in this process. Equally important objectives should include improving the quality and consistency of data (both collected and reported), and the timeliness of its availability to the fishing industry.

Improvement could come from identifying and replicating best practices within the agency, evaluating approaches used in other government or private sector contexts, and potentially from outsourcing some portion of this responsibility to experienced third parties.

¹ Catch Shares & Commercial Fishing Communities Workshop, January 2011, Topic 7, "Facilitating Community Organization Efforts." <http://tinyurl.com/atdes3z>

Promoting Innovation and Entrepreneurship

NMFS and the Councils face an especially difficult challenge delivering on their obligations to communities under MSA and the National Standards Guidelines. The issues are complex. The terminology can be confusing; the goals and objectives are not often clearly defined, and there are few reliable metrics to measure and evaluate progress.

Community issues are also very local, requiring fairly unique or customized approaches to properly address them. Every community has its own history, its own set of participants with their own values and priorities.

Against this backdrop, NMFS and the Councils work with limited resources and few tools to address community issues. In attempting to address them, management plans risk creating unintended consequences including reduced operating flexibility and higher costs for businesses. Refinement often gets pushed to a series of trailing amendments that creates greater uncertainty and instability.

To improve this process, new perspectives, tools and approaches need to be brought to designing management plans. A new process must foster more innovation, creativity and flexibility to better craft solutions to the circumstances of each situation.

An ambitious path forward would be to transition NMFS from its current role of controlling design and implementation of most aspects of fishery management plans to a decentralized model with NMFS and the Councils focused on setting goals and performance standards for management plans and enforcing compliance with those standards.



The intention would be to energize consortiums of participants from the fishing industry and the broader fishing communities together with other members of the private sector and nongovernmental community to take greater ownership of the design and implementation process.

The hope would be that this approach generates new solutions that better suit individual community needs and that are more adaptive to the rapidly changing circumstances in fisheries. Further, changing roles and responsibilities as suggested may help to build a greater level of trust and cooperation among fishermen, fishing communities, NMFS and the Councils.

Making this transition could be complicated and difficult, but there are possible models for what it might look like. In the U.S., cooperatives in Alaska and the risk pool created in the Pacific Groundfish Trawl Fishery to manage access to low abundance stocks are both good examples.

Outside the U.S., there are other possible examples in developed countries such as Canada (British Columbia) and New Zealand.

Conclusion

Addressing community issues is one of the more difficult mandates the Magnuson-Stevens Act assigns to NMFS and the Councils. This task is clouded by two false points of view that need to be put aside. The first asserts that conservation and communities are somehow pitted against each other. The second claims that the most successful communities will be those that preserve some historical perspective of what communities have been.

To move forward, efforts need to focus on building the strongest possible communities capable of managing the current realities of a changing environment, evolving social priorities and a more demanding marketplace for seafood. While NMFS and the Councils have few tools to work with, there are several steps they should take to help communities, and the businesses that are a major part of those communities, adapt to rapidly changing circumstances.

First, they should keep costs of management reform as low as possible for fishing businesses by taking steps that include proactively adopting new processes and technologies, engaging private sector service providers where possible, and allowing small businesses to work collectively.

Second, NMFS and the Councils should facilitate small-scale operators' access to resources that can help them build stronger businesses. Specifically, they should work with the private sector and nongovernmental community to make available investment capital, technical advice on business and organizational topics, and fishery-related data that businesses can use to operate more efficiently.

And third, NMFS should strongly consider devolving responsibilities for both designing and implementing community-specific programs to the communities themselves in the interest of stimulating new and innovative approaches. Together, these steps can meaningfully improve communities' success, creating solutions that work best for them.



Darden Restaurants' Sustainable Seafood Vision

ROGER BING

VICE PRESIDENT OF PROTEIN PURCHASING, DARDEN RESTAURANTS

Background

Darden is the world's largest full-service restaurant company with more than 2,000 wholly-owned and operated restaurants employing more than 185,000 people. We serve over 400 million meals a year through our eight brands, including Red Lobster, Olive Garden, LongHorn Steakhouse, Bahama Breeze, Seasons 52, The Capital Grille, Yard House and Eddie V's. Darden is also a growth company that expects to open approximately 400 new restaurants in North America within the next four years. This includes:

- Augmenting the number of our traditional brand units
- Optimizing non-traditional opportunities, such as synergy restaurants (two concepts in one building)
- International growth into the Middle East, Mexico, Puerto Rico, and soon Brazil, Colombia, Panama and the Dominican Republic
- Incubation of other business, such as our lobster aquaculture farm in Malaysia

Darden serves a wide variety of foods, but perhaps no food is more integral to our company's history and future growth than seafood, the single largest item in our "food basket." We rank as the largest end-user of multi-species of seafood in the United States, purchasing approximately 200 million pounds of seafood (live weight basis) annually and operating a global supply chain sourcing from 35 different countries. By 2016, we anticipate purchasing about 275 million pounds of seafood (live weight basis) annually. However, demand for seafood as one of the healthiest, affordable proteins available to feed a growing population is fast outpacing supply.

As a significant industry stakeholder, we appreciate the opportunity to offer the following comments and recommendations to Managing our Nation's Fisheries 3.

As a leader in seafood sustainability and an active stakeholder in the health of oceans and management issues, we see two aspects of the industry that, while independent of one another, are interrelated in the provision of a sustainable seafood supply to the U.S. market: the sustainability of the biomass, and the need for U.S. aquaculture.

Sustainability of the Biomass

For Darden, seafood sustainability is not only a social and environmental responsibility; it's a core business issue. Our future growth relies on our ability to remain a reputable stakeholder in the advancement of sustainable fisheries, ensuring the supply of seafood is available, affordable, and meets the quality and safety standards we expect. Investing our time, expertise and resources in the proper stewardship of fisheries supports our growth goals and desire to remain a great place to work.



While the health and productivity of our oceans and water ways are imperative, the manner in which the seafood industry engages the market has implications on business investment, consumer patronage and community development which holistically is involved with sustainability.

The seafood industry and government must be pro-active to address food safety, environmental and social justice concerns for consumers and the guests at our restaurants. Unfortunately, governments have neglected to act on certification standards and have left the door open for various stakeholders to define and to interpret what sustainability is and what science to elect for their standards. This has created a bountiful number of certifications and labels, resulting in inefficiencies in production and added costs with limited, if any, value to the consumer.

For Darden, sustainable seafood has been a cornerstone for our business. In 2012, we released our seafood platform to outline our vision and strategy:

Vision for Sustainable Fisheries

We envision a future where wild fisheries and aquaculture coexist in meeting the growing demand for healthy, safe, secure and sustainable food supply while preserving and enhancing ecosystems now and for generations.

Darden's Sustainable Fisheries Mission

Darden is committed to advancing this vision with a focus on **education, engagement and improvements of fisheries.**

Education

The concept of sustainable fisheries is complex. While most want to make a positive difference, there is an immense and diverse amount of practices, standards and science that can influence our actions. We may take it for granted, but there are a large number of people that are not aware of the concept of sustainable fisheries or the role that seafood will play in feeding the world. Meaningful groundwork still needs to be laid to ensure that there is continuous improvement and ownership at all levels of the seafood community. Darden believes education can play an important role to:

- **Enhance Decision-Making**—Darden will continue to learn from and listen to the perspectives of key external stakeholders including academics, government officials, industry leaders and nongovernmental organization. We will develop systematic approaches to better ensure our buyers are informed of the issues.
- **Raise Awareness**—Darden is committed to raise the awareness level with our employees, business partners and key external stakeholders.

Engagement

Effective supply chains require constructive engagement from a number of stakeholders. Ideally, engagement should focus on efficient and aligned policies, processes and standards to ensure sustainable seafood. Participating stakeholders should use the feedback and learning's to anticipate emerging issues and improve existing efforts. Darden believes a focus on engagement will lead to:

- **Effective and Coordinated Efforts**—Darden will continue to play a role and use its influence to develop industry standards and policies that support sustainable fisheries.
- **Shared Learning**—Darden will share our experiences with key stakeholders to help develop their own processes or programs and gain insights for the development of our approach.

Improvement

Darden believes that a holistic approach is necessary for sustainable fisheries. Part of our strategy means we are committed to working with and sourcing from fisheries that are sustainable based on the best science available at the time. While the degree of sustainability can vary from fishery to fishery, we will continue to work with fisheries to enhance their overall sustainability. Our approach will emphasize the importance of integrated managements systems to better ensure sustainable supplier practices and traceability.

- Fishery Improvement Projects—Darden is committed to the “Fishery Improvement Process” and will commit to three new projects over the next three years (see below).
- Integrated Sustainability Management Systems—Darden will develop and implement a sustainable management systems evaluation of our suppliers emphasizing continuous improvement by ensuring sustainability processes are integrated and tracked with incremental improvements in mind.
- Traceability—Darden is committed to have all products required by the Food Safety Modernization Act to be compliant with Global Standards One.

Fishery Improvement Projects

In 2011, Darden made a commitment through the Clinton Global Initiative to rebuild troubled fisheries by developing and launching three fishery improvement projects over three years. The first commitment we announced is in the Gulf of Mexico Reef Fish fishery in partnership with Publix Supermarkets and the Sustainable Fisheries Partnership. This cooperative alliance is working with NOAA and stakeholders in the region to understand the value electronic monitoring systems (EMS) have in reducing bycatch while improving the health of the fishery with improved data collection. After the first six months of study, the research indicates EMS is a viable alternative to observer coverage. This summer, we will enter the second phase of research by installing three to five EMS on boats with our suppliers in the Gulf. Moving forward, Darden intends to announce our second fishery improvement project by the fall and is working with the Clinton Global Initiative to identify the tools and resources other companies need to advance sustainable fisheries through cooperative alliances like the one in the Gulf.



Need for U.S. Aquaculture

The issue of long-term U.S. aquaculture to meet growing global seafood demand is of utmost importance. Sustainability of the oceans and waterways are imperative and the manner in which the industry engages the market is critical for the future growth of the seafood industry. However, global seafood supply and demand challenges offer dynamics that can influence both subjects dramatically.

The United Nations Food and Agriculture Organization has forecasted that the world’s population will exceed nine billion people by 2050 and as a result farmers must produce 70 percent more food than today. Along with increased demand from a growing population, the transference of global wealth will have a direct effect on demand.

It is known that the proportion of animal protein in the diet increases with per capita income, with the exception of cultural and religious restrictions. As the gross domestic product (GDP) wealth transitions from developed countries to developing countries, the demand for animal protein will also increase proportionately. The question is: Will there be sufficient animal protein to fill the global demand?

It is understood that wild capture fisheries have plateaued at about 88 million metric tons (mt), and there are no new oceans to be discovered. Seafood demand, driven by population and income growth, is projected to create a supply gap of about 51 mt by the year 2030; with the largest insufficiency being in Asia. Aquaculture is the answer to fill that gap; however, the global aquaculture growth rate is slowing down, despite the fact that aquaculture seafood has the best feed conversion rate of any other animal based protein consumed in the U.S.

As the future GDP is expected to decline in the U.S., economic development is a concern as it relates to managing our future fisheries. Certainly it may be expected that developing nations may not have the same environmental and sustainability concerns that developed nations have today. As their wealth grows and demand for sea based proteins increase, this has the potential of reducing sustainability efforts in exchange for profit.

Additionally, we are beginning to see the effects of reduced income on animal protein consumption, as all animal-based protein consumption in the U.S. has declined in the past four years. There is a clear elasticity curve that has developed to show that as the cost of protein has increased in the U.S., the consumption has decreased. With regards to seafood consumption, it has declined from 16.2 pounds per capita in 2006 to 15.0 pounds per capita in 2011.

There is a growing negative balance of edible seafood exports to imports in both pounds and dollars in the U.S. This may grow as the GDP declines in the U.S., leaving less available seafood for the U.S. population. This is contrary to other animal-based proteins in the U.S. where approximately 14 percent of the seafood for consumption is domestic, while 91 percent of beef is domestic, 99 percent of chicken, and 96 percent of pork.

Aquaculture has the potential to fill many gaps that the U.S. is potentially facing. Therefore, we recommend the U.S. consider the value of a thriving aquaculture industry. The U.S. has one of the largest exclusive economic zones, and aquaculture can strategically fit into this space. With great advances in feed conversions, and energy and water use, marine aquaculture is becoming increasingly favorable vs. other animal-based proteins. The world needs food, and the U.S. requires jobs and support of fishing communities.

The real opportunity is to develop sustainable U.S.-based marine aquaculture. Sustainable aquaculture processes have been developed in Norway, Maine, Washington state, and Louisiana, among others, so it can be done. The focus should be on: a) high value species for fresh market; b) increasing focus on species with low impact that are more sustainable; and c) the revitalization of U.S. fishing communities. Third-party certification systems have been developed to create and certify compliance with standards: Global Aquaculture Alliance, Aquaculture Stewardship Council, and others. The U.S. is the best in the world at mass food production systems through leveraging science, technology, academia, and government resources such as U.S. Department of Agriculture, NOAA and the Food and Drug Administration.

However barriers to investment are numerous. There is an unclear and overlapping regulatory environment (NOAA, Army Corps of Engineers, Environmental Protection Agency, states, etc.). This requires an authority that has responsibility and accountability for an end-to-end, streamlined process. We recommend agencies align to coordinate regulatory requirements.

Marine aquaculture also requires long-term capital investment. However, existing regulations are onerous. We suggest that permits should require hitting key performance indicators or corrective steps each year to maintain approvals, rather than permit expiration and re-permitting.

Politics can negatively impact this effort in environmental, social concerns vs. consumer and business opportunities. We suggest the solutions rest in finding balance with focus on *sustainable development* and building collaborative, bipartisan, multi-stakeholder support.

Strategic focus for industry investment and government support, particularly in finfish aquaculture development, should be on the following: inshore; on-land offshore; technology enhancements; feed and nutrition; species domestication; closed-water systems and farm technology; and stock enhancement strategies.

In conclusion, the major factors effecting the management of our oceans are numerous but not insurmountable. Certification efforts have created inefficiencies, complexity, confusion and unnecessary expense; food security issues in a world with more than nine billion people are likely to increase. However, seafood is a healthy food that can positively contribute to U.S. diets, and our country has a trade balance and jobs problem which can be assisted with aquaculture. Feed conversion, space needs, energy and water use are issues with all food production systems, and are less problematic with aquaculture. Wild harvest and aquaculture can co-exist: marine aquaculture in U.S. waters can contribute positively to all of these key issues. Environmental and social concerns can be addressed through learning from existing sustainable developments; and political concerns can be addressed by creating a multi-stakeholder support team and education outreach.





CUTTING UP THE CATCH. PHOTO: RICH LUHR, FLICKR CREATIVE COMMONS (LICENSE CC BY-NC-ND 2.)



DISCUSSION SUMMARY AND FINDINGS

Session 3 Topic 2

Integrating Community Protection, Jobs Emphasis, and Domestic Seafood Quality Assurance

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Discussion Summary and Findings: Integrating Community Protection, Jobs Emphasis, and Domestic Seafood Quality Assurance

Fishing community sustainability means more than just ensuring the biological stability of fish stocks. Management mechanisms to control or rebuild fish stocks, such as annual catch limits, need to be coupled with strategies that address the social and economic needs of fishing communities.

Used alone, fishing controls to improve biological outcomes often fail to align with employment and community goals, as the former often cause short- and long-term adjustments to fishing capacity in both commercial and recreational fisheries. This is also true for other fishery management policies designed specifically for social or economic



efficiency, such as catch share programs. Undesirable community or employment outcomes in commercial and recreational fisheries that can occur as a result of management actions may include unchecked consolidation, impediments to future entry into the fishery, and disproportionately negative impacts on small scale, local, owner-operated, or geographically-limited fisheries. These management decisions may also exacerbate the loss of working waterfront infrastructure. Examples might include closures of ancillary or small support businesses such as ship chandleries, repair businesses, charter fishing operations, fishing tackle stores, restaurants, or hotels.

Despite these potential conflicts, the discussion for this session considered how biological and social goals can be integrated and how the goals can and should complement one another. Communities can play a key role in environmental stewardship and fisheries governance. Abundant resources, and a belief that there will be access rights to these resources now and in the future, were fundamental

principles underlying the discussion of community stability. In this session, participants discussed specific tools, methods, and means to protect the integrity and infrastructure of fishing communities. A major focus of the discussion was on achieving optimum yield in the face of future transitions in fishery management strategies, and changes to ecosystem and economic conditions.

The effects of fishery management policies must also be considered in the broader context of changing market forces (such as globalization and increased consumption of seafood in Asia and globally). While the conversation highlighted concerns regarding the use of aquaculture (with respect to finfish aquaculture and the food sources used), there was widespread recognition in the room that wild-capture harvest alone cannot meet the rising world demand for seafood. There is a need to use a range of tools, including aquaculture, to produce seafood.

Discussion during this focus topic centered on whether and to what degree “community-friendly” tools, including legislative, policy, and regulatory changes, are necessary to promote community sustainability. This included elements affecting the infrastructure and working waterfronts necessary to support communities, as well as the tools and processes necessary for their success in the future. Discussion included examples of how these ideas and changes could be applied.

The conversations concluded that we need to move away from the assumption that the best way forward is by pre-

serving the past. The focus needs to be on building strong, resilient communities, not on preventing communities from changing.

The results fell into three main categories: potential responses to changing market forces; possible adoption of new management tools that may broaden the economic base of seafood-based communities (such as integrating aquaculture with fisheries); and exploring the appropriate roles and responsibilities of communities, government, and private sector third-parties in finding ways to support and improve fishing community sustainability.

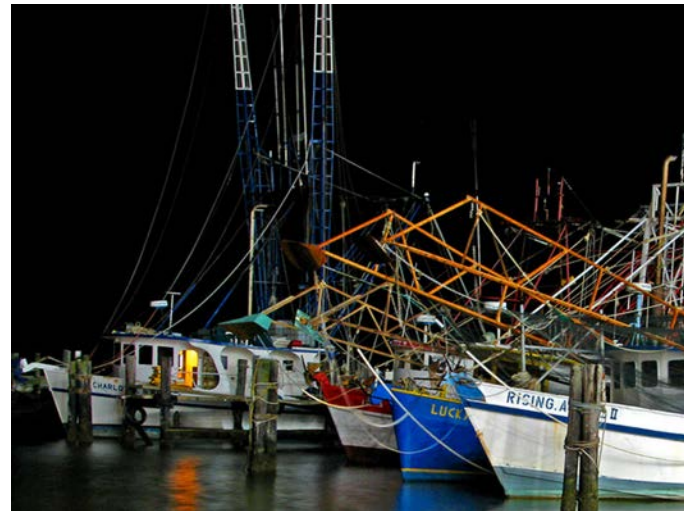
The following paragraphs highlight major points made by the speakers, panelists or audience participants. They do not represent consensus, but indicate significant ideas or directions for further thought or pursuit of action.

Work to Provide Stable Management

Stable management promotes community sustainability and stable employment. Recognizing that for fishermen, keeping costs low can be more important than high revenues to provide constancy year over year, agencies and Councils should work to keep management reform costs as low as possible. In the short-term, changes to management and regulations may force businesses to change practices, typically requiring more investment and particularly disadvantaging small businesses. The discussion acknowledged that in the short-term, stability of rules may not mean stability of outcomes or of stocks.

Devolve More Responsibility and Accountability to Industry

Devolving management responsibilities and costs to industry stakeholders and local communities was identified as a way to reduce societal costs and stimulate innovation and accountability. In the case of monitoring, higher average costs are more burdensome to smaller operators, as they represent a larger percentage of their revenue. Electronic monitoring is one way for industry to meet monitoring objectives at a lower cost. As an added benefit, electronic monitoring could allow for data to be collected from more vessels. Many examples can be derived from states. For instance, in Alaska, fishermen have taken over the hatchery system and work with the Alaska Department of Fish and Game to manage the system. Additional examples from Maine include the co-management of lobster and sea scallop fisheries.



Set Performance Standards, but Allow Flexibility in the Tools Used

Setting performance standards, while allowing more flexibility in how those standards are met, could reduce costs and offer a way to devolve governance. For example, if the industry is already capturing data, there should be an evaluation to see if these data can be used to satisfy other Federal and state requirements to ensure that effort and costs are not being duplicated. Data collection and management were both identified as opportunity areas. This approach could be applied and standards could be set without requiring the industry or communities to use specific tools or technologies.

Provide Better Access to Data

By giving fishermen more and timelier access to data, they will be better equipped as decision makers. A lack of data transparency can disadvantage smaller operators and new entrants in particular. Addressing confidentiality challenges and making more data available online would benefit multiple groups of stakeholders. These data should also be presented in a clearer, more understandable way. Providing better access to the lease and quota sale market in catch share fisheries would be particularly helpful for smaller operators, as larger operators have better proprietary markets for obtaining this information.

Provide Common Data as a Starting Point for Discussion

Providing stakeholder groups with common data and reports provides a shared framework for discussion. In particular, socioeconomic data should be presented in a clearer way and it should be more clearly tied to biological data. Tying biological data to socioeconomic data would provide an additional way to consider management needs in a more integrated way and to understand that improving indicators in one area does not necessarily require negative effects in the other. At the community level, reliable metrics would be needed to evaluate progress. In a collaborative process, the National Marine Fisheries Service (NMFS) Northeast Region created a set of performance measures that could provide a case study for use elsewhere.

Increase Stakeholder Engagement

While the Magnuson-Stevens Act and National Environmental Policy Act include processes for engaging fishermen and gathering community input, fishermen's and communities' participation in management may still be limited. There is a need to better engage communities in management. The North Pacific Fishery Management Council was recognized as a good example of state, local, Federal and industry partnerships. Other groups may be missing from the Council and Commission process. State-registered fishermen who fish in waters designated as critical habitat for Federally-managed stocks should have a voice in the Federal decision process for that area. As recreational fishermen often fish in areas outside of where they live, their needs should also be considered. Devolution may be one way to encourage participation across different levels.



Link Ecosystem-Based Management Scales to Fisheries Management and Governance

There is growing recognition that there is a need to manage at the local, fine-scale ecosystem level. Federal agencies and Councils have limited tools for managing at the local ecosystem level. This area-based approach may create an opportunity to better engage fishing communities in co-management, and it can result in better biological outcomes by increasing habitat protection, sustaining genetically distinct stocks that are normally managed at the regional level, and by facilitating more holistic ecosystem-based management. To foster more area-based management, National Standard 3 of the Magnuson-Stevens Act should be re-evaluated. In particular, the focus on management units should be evaluated to facilitate management at the sub-regional level.

Providing the flexibility to allow for multiple forms of governance and managing at different levels can also facilitate the use of adaptive management, allowing for quicker management action (e.g., the closing of an area when necessary). A decentralized model, with agencies and Councils setting goals and performance measures, could allow for greater local control. Territorial use rights fisheries could be considered. With these fisheries, an allocation is made for a given area, as opposed to allocating quota. A framework could also be set up to move towards adaptive management in some nearshore areas. This could be done through pilot projects, including public-private or state-Federal partnerships, with some amount of delegation to the sub-regional level. In the case of clams in Maine, one benefit of working at the local level was that it taught fishermen that regulation-setting is a fluid process. You may not get the regulations “right” on the first try, but the approach can be modified to better meet objectives.

Provide Management Tools and Support to Enable Management at Sub-Regional Levels

While there is value in moving towards more local control, local groups will likely need additional resources to achieve management goals. Oversight is also necessary. Participants cautioned that local control on its own does not make management inherently more sustainable or effective. Even in Maine's municipal clamming sector, which has

been a major success, access rights can be abused.

Elevate and Promote Best Practices; Become a Learning Organization

By considering what has worked in other fisheries, agencies and Councils could play a role in sharing best practices, evaluating approaches used in different fisheries and regions that might be adopted elsewhere, and providing education. Best practices can then be evaluated, adapted, and applied in multiple areas. Part of the evaluation process should include learning from others. Examples cited included state-managed fisheries, Fisheries Improvement Projects, and projects funded by the National Fish and Wildlife Foundation.

Better Utilize the Cooperative Research and Management Program Provisions

There was strong interest in building a cooperative research program that benefits the industry and scientific community using the existing Magnuson-Stevens Act authorities under Section 318. However, more defined ways are needed to ensure collaboration. Participants noted that Congress has shown interest in supporting cooperative research through funding. Collaborative arrangements that have worked well can be evaluated to determine if they could serve as a model for other regions and fisheries. Collaborative research provides the added benefit of increasing trust in science and providing a learning opportunity. [Editor's note: This last point on improving trust in science through collaboration was also made repeatedly during the Session Three / Topic One discussion on Recreational and Subsistence fisheries.]

Facilitate the Creation of Community-Based Allocations

Removing barriers that make the creation of fishing communities, Regional Fishery Associations (as defined in the MSA), and Community Fishing Associations time-consuming and expensive is one way to strengthen community protections. Creation of these entities could allow for smaller-scale fishermen to pool resources and benefit from economies of scale, potentially avoiding consolidation where it is undesirable. These entities present an opportunity for fishermen to work together voluntarily. When new management plans are being developed, Councils, NOAA Fisheries, and fishermen should partner on defining community goals. In reauthorizing the MSA, consideration should be given to including communities of interest in National Standard 8.

Evaluate the MSA Requirements for Fishing Communities and Regional Fishery Associations

While the MSA has provisions in Section 303A for establishing "Fishing Community" and "Regional Fishery Associations" entities, some stakeholders consider the statutorily-required process to be too complex and the requirements to be too difficult or risky to comply with. The result is some groups choosing to not pursue the creation of these community entities. To date, none of the Councils have set up provisions for establishing Fishing Community or Regional Fishery Association entities within the parameters defined in the Act. There was strong interest in the benefits that could result from use of these entities as a means to hold limited access privileges in a particular fishing port. A determination should be made if additional guidance is all that is needed, or if changes to the MSA are required.

In general, rules should not preclude groups of fishermen from working together, but should facilitate cooperation among fishermen. Risk pools and cooperatives in the Pacific groundfish fishery were cited as examples of how fishermen have been able to collaborate for mutual benefit. Sectors in the Northeast that can also offer positive examples of cooperation. Additional application of the Fishermen's Collective Marketing Act of 1934 should be considered.



Create, Modify and Promote Financial Tools and Training

The fishing industry is unlike most shore-based businesses from an investment risk and business management perspective, and few programs exist to support their development, growth or sustainability. To better enable the fishing industry to run profitable businesses, there is a need for business expertise and business training capacity building. These offerings would be particularly helpful for small and community-based borrowers. Offering training to commercial fishermen or their children on topics such as how to put together a business plan would help them raise capital and lower a barrier to entry.



Develop a Central Registry and Facilitate Lending

Limited access to capital can impede fishing businesses' ability to make necessary investments to stay in business or grow. While some of fishermen's most valuable assets are their permits and fishing privileges, lenders may not accept these assets as collateral for a bank loan. A registry is needed, as prescribed in the MSA, to provide a central database where lenders can validate title to fishing permits and privileges. Another way to facilitate lending would be to engage lenders in the fishery management process. Doing so would allow for lenders' needs to be considered when management plans are being designed and implemented. There are also existing finance programs that could be expanded or used as models to design new programs that would facilitate lending (e.g., NOAA's Fisheries Finance Program and the California Fisheries Fund). Limited access to capital also limits aquaculture business growth. Lease terms that do not allow for enough production cycles before the lease is up for renewal do not give aquaculturists enough time to learn from experience. For example, if a lease is up for renewal before a fish farmer has enough production cycles to learn from experience, the business may be at risk. Longer lease cycles may be needed, depending on the fish or shellfish species being farmed.

Create a Streamlined End-to-End Process for Aquaculture

Businesses need to feel greater security in the regulatory process for aquaculture in order to make investments in the U.S. versus overseas. The regulatory environment is often unclear and includes overlapping rules. More leadership from the Federal government is needed to reduce regulatory challenges. One approach would be to create the authority within a single agency to coordinate the aquaculture permitting process. From an environmental stewardship perspective, there are transfer effects of limiting aquaculture growth in the U.S. when U.S. consumers purchase products from countries with lower environmental and labor standards.

Promote and Provide Opportunities to Diversify into Other Fisheries and Aquaculture

Many fishermen do not identify as being tied to only one particular species (e.g., as only a cod fisherman or a sablefish fisherman). They see themselves generically as fishermen, and are interested in pursuing a diverse set of fisheries that can result in a profit. Ensuring fishermen have access to a diverse set of resources offers security to protect against changing environmental conditions, stock abundance levels, and market levels. Aquaculture represents another way for fishermen to diversify and weather regulatory and environmental changes. Aquaculturists have more control over production costs and can choose when to harvest their product. This added flexibility could allow fishermen to ride out regulatory and environmental changes.

Increase the Value of Stocks

Seafood quality helps to ensure market access and is a primary determinant of ex-vessel price. Fishermen are fishing

for the value of the fish, not the quantity. If the price is higher, revenues can stay constant or go up even if fishermen catch fewer fish. From a seafood buyer's perspective, this does not necessarily pose a problem, as sales depend on what the consumer is willing to pay, not just the product's cost. Aquaculture and wild-capture product also do not have to be viewed as in direct competition with one another. In this case, wild-capture product can be viewed as providing a price premium.

Various techniques have been used to increase prices. For Maine lobster, the industry was able to increase the value of the product by changing handling procedures, which resulted in a higher quality product. Alaska salmon offers a good example of a state-supported public-private partnership where groups collaborated to raise the value of the harvest. Alaska transitioned from cans to fillets and used aggressive marketing campaigns. In the case of Copper River red salmon, they also developed a nationwide campaign that allowed for an increase in price.

Increase the Market for More Abundant Stocks

Another option to provide more fishing opportunity and increase revenue is to create a market for more abundant, underutilized stocks. This requires moving consumers out of their comfort zone and educating them about less well-known stocks. One way to do this is through Community Supported Fisheries (CSFs), which are similar to Community Support Agriculture. In a CSF, a group can band together and sell assorted catch directly to consumers at a higher market value than those species would normally have. With a CSF, the consumer does not just know the supply chain; they know the fisherman who brought in the fish. Consumers are exposed to unfamiliar stocks, opening up new markets for fishermen; they are educated about ways to prepare the fish, and are more closely tied to the local fishing community and the source of their food.

Recognize Fisheries Managed Under the Ten MSA National Standards as Sustainable

The discussion highlighted a widespread interest in providing better recognition that U.S. harvested seafood is managed sustainably. This is becoming more important as participation in certification programs is increasingly becoming a requirement for market access. Concern was expressed about third-party certification program requirements that go beyond providing for a healthy stock. For seafood businesses such as restaurants and retail stores, many consumers trust the brand to ensure that the seafood they purchase is sustainable, as a consumer would trust the brand to provide safe seafood. Buyers are looking for consumers to trust their brand. The front-table participants acknowledged the benchmarking approach of the upcoming Global Sustainable Seafood Initiative as one means to level the playing field and protect against market dominance by a particular certifying entity. Another approach suggested was Alaska's use of the United Nations Food and Agriculture Organization's Code of Conduct for Responsible Fisheries.

One suggestion that appeared to have support was to place greater emphasis on the connection between fish managed under the MSA as a sustainable food product through the addition of legislative language during the next reauthorization of the MSA. The need to acknowledge sustainably managed state and local fisheries was also recognized, though they are not managed under the ten national standards.

Ensure There is a Plan to Provide for Future Access to Resources

There should be a plan to allow future generations of fishermen to resume fishing once a stock rebuilds. To ensure that access to resources will exist in the future, plans are needed for dealing with closed areas when stocks are rebuilt and in areas where permits are not transferable. Providing fishermen and communities with assurance that resources will be available in the future promotes environmental stewardship in the present.





FISHING DURING HIGH WATER NEAR THE MISSISSIPPI DELTA. PHOTO: DON PIROLO, FLICKR CREATIVE COMMONS.



PAPERS

Session 3 Providing for Fishery Community Stability

Topic 3 Assessment and Integration of Social and Economic Tradeoffs

ALLOCATION BETWEEN RECREATIONAL AND COMMERCIAL SECTORS IN U.S. MARINE FISHERIES: A
RECOMMENDED APPROACH: JIM MARTIN

VALUE TRADEOFFS IN FISHERIES MANAGEMENT: MARTIN D. SMITH

ASSESSMENT AND INTEGRATION OF SOCIAL AND ECONOMIC TRADEOFFS—A MID-ATLANTIC PERSPECTIVE:
RICHARD B. ROBINS, JR.

Allocation between Recreational and Commercial Sectors in U.S. Marine Fisheries: A Recommended Approach

JIM MARTIN

CONSERVATION DIRECTOR, BERKLEY CONSERVATION INSTITUTE



Allocation between recreational and commercial fisheries has always been a difficult issue, fraught with emotion, stress and competing views of economics, efficiency and fairness. In my 44 years of experience in fisheries management, I have found few issues that are as potentially powerful in increasing net economic benefits to regional/national economies and supporting more jobs—and as universally avoided by managers. One of the reasons that allocations are “rusted shut” in current marine fisheries is that there is a lack of forcing mechanisms to regularly review allocations, and a lack of standard practices for proceeding. Thus, very few managers or fishery management Councils are ready to tie up the staff time and agenda time, and willingly submit themselves to the political stresses of a potential reallocation. It is just far easier to allow the status quo to continue until it is so dysfunctional that change is forced upon the manager by political forces.

Background

Many mixed-sector fisheries were once primarily commercial fisheries. In the days before the first Magnuson Act in 1976, many fisheries in state waters were lightly regulated and the concept of a Federal Exclusive Economic Zone (EEZ) did not exist, so deeper water fisheries were largely unregulated. With the establishment of the EEZ and the development of the Regional Fishery Management Councils in the 1970s and 1980s, there was a concentrated effort by Federal government agencies to work cooperatively with commercial fishing interests to develop gear and fishing techniques to fully prosecute fisheries in the EEZ, many of which had formerly been dominated by foreign fishing fleets. Recreational fisheries were largely overlooked and were often impeded by inadequate gear and inadequate interest in these deeper-water fisheries.

Therefore, in the 1990s when many recreational/commercial fisheries allocations were established for mixed-sector fisheries, historical catch percentages were deemed fair and appropriate as a basis for the first formal allocations. These historical allocations were the product of minor and undeveloped recreational fisheries competing with industrial commercial fisheries that had experienced major government support in development. Often these fisheries were operating in a lightly regulated structure or were totally unregulated. Once the shares were set by the Councils, they often continued for decades, deemed as “fair.” In the succeeding years there has been huge growth in interest by recreational anglers and the development of gear that allows recreational anglers access to deeper water species that were formerly inaccessible.

Today, many mixed-sector fisheries still have sport/commercial allocations left over from a time when the fisheries were both larger and unregulated. As fisheries are constrained by management, many people recognize that a reallocation of smaller, more modern fisheries could lead to greater economic benefits and support more jobs with a lighter conservation burden, but the stress of reallocation is too much for many managers to take on.

Two notable exceptions have been the reallocation of Pacific coast coho salmon in the 1980s by the Pacific Fishery Management Council and the current effort to examine allocation of the snapper/grouper complex in the Gulf of

Mexico. The reallocation of Pacific coast salmon greatly increased economic benefits, and the same seems likely in the Gulf of Mexico now.

However, these two examples are among the very few efforts by Councils. They point to potential economic benefits in other areas, in other fisheries, that could be realized with a systematic and regular examination of allocation. Most importantly, there is a lack of a policy framework for regularly reallocating fisheries in order to maximize the economic and conservation benefits of these fisheries to the Nation, as was originally envisioned by the Magnuson Act.

Solutions

The first issue is the lack of a forcing mechanism that requires a public review of the potential for reallocation to improve economic and conservation performance of fisheries. Currently, it is up to Regional Fishery Management Councils to decide when and if reallocations will be opened up for review. In many cases, even though the evidence is strong that reallocation could substantially improve results, the resistance by commercial fishing interests and the prospects for a long, controversial, and stressful process causes the Councils to punt and allow outdated allocations to continue. NOAA Fisheries seems to have no opinion on the topic, just allowing the Councils to decide the issue. That needs to change.

A regular review schedule is needed—perhaps a review of all significant mixed-sector fisheries every five years, with a transparent and public decision by each Council as to which, if any, fisheries merit a more detailed and intensive analysis of the benefits and impacts of reallocation. This first level review is what one might call a “scoping review,” as opposed to a formal reallocation process, and might summarize current status and trends of economics, demand, substitutes, jobs and conservation impacts.

As a result of such a review, the Councils could report to their constituents and to NOAA Fisheries on which fisheries should continue with status quo allocations and which have are worth a more intensive review and possibly an allocation change. This would allow the public to comment on the scoping analysis and to recommend action.

The second issue is the development of standard practices and criteria by which to evaluate the potential for a reallocation. Currently, there seems to be a lack of standard practices for conducting a reallocation analysis, leaving every interest group to suggest their favorite way of viewing economics, jobs, efficiency and conservation. What is needed is for NOAA Fisheries to develop a checklist of issues to be addressed in any reallocation process, along with standard practices for conducting such analyses. Any analysis should include a comparison of the economic value of recreational and commercial fishing, and an analysis of substitutes to determine if a reallocation would cause a net loss of jobs and economic benefits, or simply force a shift to substitute species or fisheries.

Market Forces as a Solution?

With increased interest in catch shares or individual transferable quotas in many commercial fisheries, some have suggested that the solution to reallocation is to provide ways for recreational fishers to individually or collectively buy quota share from commercial fishing interests. Although NOAA Fisheries has mentioned this potential in its catch share policy, no action has been taken. Recreational fisheries interests believe that while such a mechanism should exist and might provide a solution for misallocated fisheries, this is not a substitute for the public responsibility to regularly review allocations.

Summary of Recommendations

We recommend that NOAA Fisheries, in cooperation with the Councils, develop a schedule of allocation reviews in significant mixed-sector fisheries, covering all fisheries every five years. The Councils would be obligated to take public testimony and recommendations regarding the adequacy of the scoping analysis and whether it is time to reallocate a fishery. We envision that NOAA Fisheries would develop a standard protocol for conducting the scoping





analysis and would provide summaries for Council consideration. Then, if the Councils decide that the evidence and the testimony are compelling enough to take on a formal allocation review, it would be the Council's responsibility to coordinate the more elaborate analysis.

Secondly, NOAA Fisheries should develop guidance on the issues that should be considered when a formal reallocation analysis and potential reallocation decision is considered. Guidance is needed on standard practices for estimating the impact on economics, jobs, conservation and other societal values. By developing standard practices, we might be able to avoid the "dueling economists" problem that plagues this issue and to determine the scope of analysis that should be required to ensure an adequate basis for reallocation.

Such guidance is provided by NOAA Fisheries in other aspects of management, such as the development of annual catch limits and rebuilding plans. This guidance on allocation analyses is long overdue, and its absence makes the process of considering allocation almost an overwhelming hurdle, due to its potential stress and acrimony. Thus, this issue is "rusted shut." The

resource, the economy and our communities deserve better.

Value Tradeoffs in Fisheries Management

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Introduction

Fisheries management inevitably involves tradeoffs. Most of these tradeoffs are implicit rather than explicit in management decisions that typically focus on one source of value without regard for others. Economics can improve fisheries management in four ways: 1) provide a framework to make value tradeoffs explicit and transparent, 2) help managers to avoid unintended consequences by studying economic behavior, 3) design new policies that align incentives of fishermen (and other stakeholders) with the objectives of management, and 4) evaluate the causal impacts of policy interventions. I focus on the first of these contributions in this paper.

When a decision implies giving up economic value of one type to gain it for another, economic analysis can help to balance the two. But there are other times when decisions imply trading economic value for something non-economic, such as social considerations. Although in these situations managers may choose not to maximize total economic value, economic analysis can at least quantify what is lost and what is gained. Because most fishery resources are part of the public trust, it is reasonable for citizens to expect this minimal level of transparency.

For decades, economists have had a strong theoretical understanding of fisheries management at a fairly abstract level. Given a single stock of fish with known population dynamics that exists in isolation from other species—both ecologically and economically—and assuming we know market demand and costs of harvest, one can derive the profit-maximizing long-run harvest as well as the short-run transition harvest that gets the stock to its long-run desired level. However, the relevance of this normative guidance for fisheries management is limited because real fisheries do not exist in a stylized vacuum and are fraught with complications. Some complications are technical challenges that highlight how management decisions implicitly trade off commercial fishery values. Much of fishery management is about setting quotas, and biological considerations often tie the hands of managers. Other complications involve broader economic values involving multiple sectors and a mixture of market and non-market values. As fishery managers seek to define “optimum yield” (OY), they must confront these many complications. It is not necessary for managers to buy into the economic perspective on how to define the optimum in order for normative economics to be useful. By quantifying economics values, normative economics can facilitate a more systematic evaluation of potential outcomes of management decisions and improve the transparency of decision-making.

The issues that call for economic analysis of tradeoffs are well known in fisheries management. Most notably, the world’s leading fisheries scientists cannot assess fish stocks and estimate population dynamics with perfect accuracy. Some fisheries are more difficult to study than others. In the face of stock uncertainty, fishery management with acceptable biological catch (ABC) control rules implicitly trades off reduced expected harvest against risk of overfishing, a decision that can significantly affect flows of economic value over time. Moreover, no species is disconnected from its food web. Some species serve roles in the ecosystem that may justify leaving more or taking more of the stock. On the economic side, harvest costs are notoriously difficult to measure, greatly complicating the determination of OY. Bycatch and multispecies targeting are economic dimensions that connect species in the water and, like ecological interactions, challenge managers to think beyond single-species management. And economic interactions



are not limited to the water; consumer demand for substitute seafood products or other sources of animal protein ultimately connect fishery resources once they are landed. All of these technical features of fisheries introduce tradeoffs, but usually these tradeoffs are implicit in management decisions. Consideration of other types of value—such as commercial values from other uses of the oceans and non-market existence values non-market value from recreational fishing—further reinforces the need for economic analysis to support management decisions.

Economic Value Versus Economic Impact

One of the most challenging issues in fisheries management is the potential for tradeoffs across economic value and economic impact, concepts that are often confused. Value is the net contribution of an economic activity to society, whereas impact is the gross amount of spending from that activity. Pursuit of economic value may actually decrease economic impact. Consider two hypothetical businesses that have different revenues and costs. Business



A has \$100K in revenue and \$60K in costs, whereas business B has \$90K in revenue and \$30K in costs. Which business would you rather own? Without any other information, it is clear that B is preferred because revenues net of costs are \$60K compared to A's net revenues of just \$40K. Business B generates more economic value than business A. However, it would appear that business A generates more economic impact. It has higher revenues. Moreover, because A's costs are higher, more money may be churned through the local economy, and A may provide more jobs. Thus, there is a potential tradeoff across economic value and economic impact.

Now suppose these two businesses are fishery operations harvesting the same resource in two different hypothetical worlds. Business A is mildly overfishing in a regulatory system that is highly inefficient and drives up costs (e.g. regulated open access with a total allowable catch [TAC] set too high), whereas B is harvesting sustainably and minimizing costs (e.g. catch shares with TAC set at the right level). In this situation, part of A's greater economic impact is attributable to overfishing. The way we define OY under the Magnuson-Stevens Act (MSA) does not allow us to choose higher economic impact by overfishing. But we can choose economic impact over economic value if we are not overfishing. This means that adjusting the TAC downward in the business A institutional setting, but preserving the otherwise inefficient management regime, is allowed. Managers essentially are allowed to trade economic value of public trust resources to support jobs in a particular sector of the economy. Of course, this hypothetical presumes that there is a tradeoff between employment outcomes and economic value in fisheries management. This issue is much discussed and an emerging topic of research in fisheries economics. What little empirical evidence that is available suggests that employment outcomes are not compromised by managing for economic value with catch shares.

Although the appropriate comparison for employment outcomes is with and without a particular policy and holding all other dimensions of a fishery constant, initial conditions in fisheries management make it difficult for this comparison to be made. Many fisheries managers have inherited overfished stocks and overcapacity, and these starting points greatly complicate the way the forward. Stakeholders grew accustomed to high levels of catches and employment. The stylized normative economic model of harvest presumes that managers can shut fisheries down entirely to rebuild to the desired long-run stock level or, if the stock is above the long-run level, the number of fishing vessels is taken as given. It may not be possible to support historically high levels of employment and number of vessels in some fisheries while avoiding overfishing. But when possible, it may be extremely costly in terms of value to sustain these economic impacts.

While the legal requirements of the MSA limit what managers can do, managers are free to define OY with measures that decrease economic value but concentrate it in local communities as long as overfishing is avoided. In essence, policies are allowed that stimulate overcapacity, such as industry-wide quotas. In the extreme, this management approach can lead to high levels of short-term employment with short seasons and product gluts. My opinion is that society should maximize total economic value from marine resources, but if managers choose to give up economic value in the name of economic impact, this tradeoff should at least be made transparent so that all parties know what

is being given up.

An example from my own research serves to illustrate further the distinction between economic impact and economic value, and provides a cautionary tale about the use of economic impact. In two papers, I analyzed the effects of hypoxia (low dissolved oxygen) in the Neuse River Estuary on the North Carolina shrimp fishery. The first paper showed that the environmental disturbance led to a roughly 13 percent decrease in revenues (approximately \$1 million/year). The second paper showed that the corresponding lost economic value was between four and five percent of revenues (roughly one quarter of the raw revenue losses or \$250,000 per year). The difference is attributable to fleet behavior (specifically decisions about how often to participate) and the cost structure of the industry. Both numbers contribute to understanding the scale of the hypoxia problem, but only the second number is relevant for policy analysis. To illustrate why, suppose that hypoxia only affects the shrimp fishery. If society spent the entire \$1 million revenue loss to clean up the environment, the result would be a decrease in net economic value of \$750,000 because the gain in value would be only \$250,000.



Direct Market Value, Indirect Market Value, and Non-Market Value in Fisheries

Stock Effect

A classic example of direct value in commercial fisheries that would adjust the OY is the stock effect. For some fisheries, the costs of harvest are significantly higher when the stock of fish is low. This can lead to situations in which the desired long-run stock from an economic point of view actually exceeds the stock level that would sustain maximum sustainable yield (MSY). Of course, there are other situations in which the desired long-run stock is below the MSY level. The MSA allows managers to adjust OY to account for the former but not the latter; the stock can be above the MSY level due to economic considerations, but not below it. This creates an interesting asymmetry in that economic value is sometimes but not always allowed to enter into management decisions. Managers' hands are tied on one side of MSY but not on the other.

Forage Species

Some economic value in fisheries stems from the indirect contribution of one species to the harvest value of another. This is the case when multiple fished species interact ecologically. An important current concern is forage fisheries, where forage species are food for higher trophic species that often have higher market prices. The recent Lenfest report on forage fisheries attempts to evaluate tradeoffs across forage species and higher trophic species, but failure to characterize the economic tradeoffs sensibly leads to policy advice that could be misleading. Specifically, the report uses forecasted revenues in different fisheries as the basis for evaluating economic tradeoffs (i.e. using catches weighted by ex vessel prices). Our simple example above of businesses A and B illustrates how misleading this could be if profit margins are not the same across fisheries; it might be possible to increase revenues while decreasing economic value. One might reasonably object that the cost issue could cut either way, but there are some typical differences between fisheries for forage and for high-trophic species. Most notable is that forage species tend to school, which is consistent with low or no stock effects in the cost structure of the fishery. Whether this cost advantage in forage fisheries translates into systematic differences in economic value is an empirical question. Similarly, some fishing gears require dramatically less fuel than others (e.g. purse seine compared to trawling). Thus, the gear types used by a forage fishery and a higher trophic-level comparison fishery could significantly influence costs and value comparisons.

Constant Prices

Treatment of prices can also complicate tradeoffs across species. Using constant prices in modeling tradeoffs across fisheries is a natural starting place, but may not be an innocuous assumption in the context of modeling forage and non-forage species. Suppose managers deliberately reduce harvest of forage in the interest of increasing harvest of non-forage. Elementary economics suggest that the price of forage would increase and the price of non-forage would decrease. One might conjecture that these effects would wash out, and the constant price assumption is close enough. However, the markets for the species are likely to be quite different. Forage species largely are used in fish-

meal and fish oil, which are global commodities. A landings reduction in one particular forage fishery may not affect the price because the particular forage fishery is a small share of the world market, whereas markets for non-forage species may be more responsive to quantity increases, suggesting that prices for non-forage will decline. This means that the reduction in forage revenues may be correctly modeled with a constant price assumption, but the increase in non-forage revenues would be overstated. A price response would be expected in a forage fishery with a large market share such as Peruvian anchoveta. The extent to which asymmetric price response matters for policy analysis is an empirical question, but there are strong theoretical reasons to question the policy guidance in the Lenfest report.

Discount Rates

When managers consider species tradeoffs, the time value of money is also critical. In the forage case, rebuilding non-forage species by reducing forage species harvest inevitably will take time. The longer this transition takes, the larger the long-run benefit must be to make sacrifices in the short run. Using the Office of Management and Budget's standard seven percent real discount rate, suppose that forage reductions produce a net loss of 20 percent of profits each year for ten years, and this loss produces a permanent gain in profits starting in the eleventh year. How big does the gain have to be to justify the loss? It turns out that the permanent gain would have to be 19.3 percent of profits

to make up for this temporary loss. If the rebuilding took fifteen years, the gain would need to be 35.2 percent. While the MSA requires managers to meet rebuilding targets to eliminate overfishing, rebuilding forage stocks beyond that need to be justified based on OY. These simple calculations illustrate how substantial the hurdle is to justify significant reductions in forage harvest if basic rebuilding goals have already been met.

Marine Reserves

Similar logic applies to justifying the creation of a marine reserve for fisheries management. Spatial oceanographic processes, locations of fishing ports, and the ecology of metapopulations can create circumstances in which a fishery resource can generate more economic value if access is differentially controlled over space. And there are theoretical circumstances in which shutting down fishing entirely in some areas can generate net economic benefits. However, the transitions to these long-run outcomes are important. Long-run gains may need to be large to justify the short-run losses, which are inevitable when eliminating a fishing ground.

Modeling Risk

Indirect value tradeoffs also raise vexing questions about risk. The Lenfest report suggests that leaving more forage fish is precautionary. From an economic point of view, this strategy could be viewed as just the opposite of precautionary in many U.S. fisheries. Increasingly, U.S. fisheries are successful in preventing overfishing under the MSA. Reducing forage harvest would incur substantial risk in this context. In essence, fishermen would be asked to give up a more certain outcome of status quo harvest for a gamble on a potentially higher future harvest of different species with different market conditions. This gamble, which may very well be a good one, relies on ecological model predictions for which parameters are highly uncertain. The precautionary principle applied to economic value suggests that advocates for reduced forage harvest are the ones with the burden of proof. They would need to show that reduced forage harvest is not harmful to the economy.

Market and Non-Market Values

Total economic value of marine resources includes market and non-market values, and some of the most challenging management problems involve situations in which these sources of value are in conflict. The distinction between indirect market value and non-market value can be a fuzzy one. Existence value for the conservation of great white sharks, for instance, would be a non-market value. However, conservation of sharks for their contribution to regulating ecosystems that generate extractive values from non-shark species would be a source of indirect market value. In both cases, the economic problem of attaching monetary value to the resource is a difficult one, but well within the toolkit of the profession. Non-market values by nature do not generate contributions to the market economy. For



this reason, it can be difficult for managers to choose these values when they involve tradeoffs of market value. Nevertheless, quantifying non-market values, and the magnitude of tradeoffs, is a way to highlight situations in which potential losses in total economic value are greatest when non-market values are ignored.

Sector Allocations

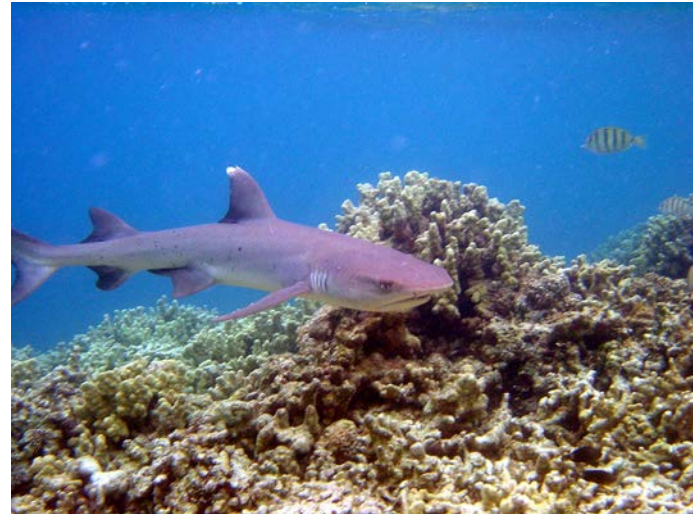
In contrast to existence values, non-market values in the recreational sector are well represented by the recreational fishing industry. Although individual anglers are the beneficiaries of non-market value (e.g. enjoyment of fishing, harvested fish that they do not purchase), they contribute to the tourism industry through purchases of fishing tackle, bait, food, and hotel rooms as well as through hiring recreational charters. The difficulty for managers is that commercial and recreational sectors often compete for the same resource. Allocating more of the resource to one sector inevitably involves allocating less to the other. And in most cases, the beneficiaries of the allocation are different people. So, any attempt to reallocate in the name of generating more total economic value also redistributes that value.

Non-Fishery Values

Non-fishery uses of the oceans such as aquaculture and offshore wind energy development pose potentially different tradeoffs for fishery managers. In some circumstances, these alternative uses may contribute more to total economic value than using the space for fisheries. Regional Fishery Management Councils may not have the jurisdiction to allocate space directly, but fishery stakeholders are likely to be involved in these decisions. As a society, we still know little about which patterns of ocean development will generate the most economic value: spatial segregation or mixing of uses. As debates about how to organize ocean uses spatially unfold, monetizing the values from different sectors will provide a means to evaluate tradeoffs transparently.

Conclusions

The idealized normative economic view of fisheries management would quantify the wide range of direct market, indirect market, and non-market values from fisheries and other uses of the oceans and then seek to maximize total economic value over time and space. For technical reasons and for political reasons, it may not be possible to define OY in real fisheries according to this vision. As a way forward, economics can help to frame tradeoffs in real fisheries management by exploring complications to the single-species paradigm one issue at a time.



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Assessment and Integration of Social and Economic Tradeoffs—a Mid-Atlantic Perspective

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Social and economic factors are intrinsic components of U.S. fisheries and their management by the Regional Fishery Management Councils and management partners. Many individual fishermen make economic decisions every time they leave the dock. Global market conditions may determine the scale and timing of effort, and landings, in any particular U.S. commercial fishery. Exogenous macroeconomic factors, such as fuel prices and consumer confidence, also have a strong influence on a range of commercial and recreational fisheries, resulting in attendant social and economic impacts. The full suite of measures used to manage U.S. fisheries, from quotas to technical measures to allocations, have direct and indirect social and economic consequences that begin with fisheries stakeholders and affect a wide spectrum of related industries. This paper reflects on the past influence and consequences of fisheries economics in the Mid-Atlantic region and looks forward to opportunities to improve the incorporation of social and economic factors and stakeholder values into the Council decision-making process.

The Council system is designed for Council members to analyze and consider social, economic, ecological, and biological information as they develop fishery management measures and programs that manage fishery inputs and outputs. In fact, fishery managers analyze and predict human behaviors and fisheries characteristics and then design a management approach that will change those behaviors to achieve a desired management objective. These decisions are informed, implicitly or explicitly, by decision-makers' knowledge and comprehension of the fishery's biological, social, and economic dynamics.

For the Mid-Atlantic Council, the last three decades have been largely defined by ending overfishing and rebuilding overfished fisheries. Although nearly all of these fisheries have been successfully rebuilt, many fishing communities in the region have struggled to regain stability and economic viability. Many stakeholders who interacted with the Council during the rebuilding process concluded that the Council process was unresponsive to their input. This sentiment was widespread and led to significant stakeholder disaffection and disengagement, leading many to conclude that economic impacts are not adequately considered or weighted in the Council process. In cases where the Council was rebuilding stocks as required by the Magnuson-Stevens Fishery Conservation and Management Act, the Council considered the social and economic impacts associated with rebuilding but was nonetheless required to set quotas at levels that would rebuild the stocks as required by law. Consolidation also occurred within the commercial fleet and processing sector during the stock rebuilding periods, and there has been significant attrition within some components of the recreational for-hire fleet as well. Low or variable quotas during rebuilding periods have altered U.S. and international market conditions for these fisheries, and for some species, market shares have largely been replaced by other domestic or international substitutes, or otherwise truncated due to a lack of steady supply during stock rebuilding. The challenge of rebuilding Mid-Atlantic stocks has been replaced by the challenge of long-term, sustainable management that recognizes the social, economic, and ecological importance of these stocks to stakeholders and the American public.



The Council has, over the last two years, worked collaboratively with its stakeholders and management partners in an effort to develop a vision and strategic plan for Mid-Atlantic fisheries to address this transitional challenge. As part of this process, and in an effort to better understand the individuals and communities that are affected by our management decisions, the Council has engaged stakeholders through surveys, port meetings, and position letters to get their ideas, concerns, and recommendations for Mid-Atlantic fisheries. Their vision and input will be used in a strategic planning process that will enable the Council to manage the region's fisheries more effectively in the both the near future and long-term by creating more social and economic value from our managed fisheries.



History

The Council's consideration of social and economic factors dates back to 1977 when the Council developed the first Federal fishery management plan (FMP) for surfclam and ocean quahogs. At the time, the Council recognized that surfclam populations were declining and that a long-term stock rebuilding program was necessary. The FMP explicitly acknowledged that such a rebuilding program would require significant reductions in the allowable harvest levels and adverse economic impacts were an unavoidable cost of rebuilding the fishery to sustainable levels.

In fact, most Mid-Atlantic Council FMPs were developed during periods when substantial negative social and economic impacts were imminent as a result of declining stocks. For example, the summer flounder FMP was developed in 1988, a time period corresponding to rapidly declining catches, low stock recruitment, and critically low spawning stock biomass. During the development of this and other FMPs, consideration was given to the economic, cultural, and sociological factors, particularly with respect to allocation decisions required for quota-based management, impacts of rebuilding programs, and permit and gear requirements for these fisheries. Specifically, the Council considered the social and economic effects on stakeholders and their communities and determined the benefits that these rebuilt fisheries could provide, including sustainable seafood products for consumers, domestic food security, and the economic stability of coastal communities.

Over time, the impacts of rebuilding the Council's managed resources have been substantial. With most of the Council's stocks above B_{MSY} , these fisheries are now seeing the benefits of recovered resources. However, sustainable management is not without its own unique social and economic challenges. For Mid-Atlantic Council-managed fisheries, user group conflicts exist between commercial and recreational fisheries, as well as between sub-user groups and between Federal and state fisheries. Additionally, although the Council sets most of its quotas for rebuilt stocks at approximately 81 percent of F_{MSY} , some of the quotas associated with rebuilt stocks (e.g. summer flounder, spiny dogfish) are substantially lower than the landings levels that the industry used to scale its capital investments in the 1980s and 1990s. These levels were unsustainable, leading to stock rebuilding and all of its consequences, and highlighted the need to manage expectations and discuss biological and economic outcomes early in the rebuilding process.

In the Northeast region of the U.S. (Maine through North Carolina), the commercial fishing fleet is mobile and diverse in size, as are ports and processing facilities. The recreational fisheries in the region are highly diverse and include not only private anglers, but also for-hire vessels (i.e., party and charter boats with paying customers) whose business interests may reflect different values and regulatory preferences. With diverse user and sub-user groups over a large geographic area, management decisions produce both winners and losers through distribution of socio-economic impacts. As such, the integration of social and economic factors in management decision-making is intended to minimize those impacts and differences and is an essential component of successful Council management.

A Vision and Strategic Plan for the Mid-Atlantic Fishery Management Council

In 2010, the Council initiated an effort to engage stakeholders in the development of a vision and strategic plan for Mid-Atlantic fisheries. The need for a long-term vision and strategic plan emerged over the course of several years as the Council achieved many of its rebuilding goals. Despite these successes, the Council faced uncertainty regarding

how to best transition from a phase of rebuilding to an era of long-term sustainability and stability. Many communities in the Mid-Atlantic region had experienced adverse social and economic impacts during rebuilding, and as a consequence, many of the Council's stakeholders had become disengaged in the fisheries management process. The Council initiated the Visioning and Strategic Planning project as a way of reengaging stakeholders and developing a long-term, stakeholder-driven plan for achieving biological sustainability for the fishery while promoting social and economic well-being for the fishery's stakeholders.

In September of 2011 the Council launched a two phase project: the first phase focused exclusively on stakeholder outreach and engagement, while the second phase focused on the development of a strategic plan. Over the course of five months, the Council solicited stakeholders' ideas and opinions through surveys, position letters, and small group meetings along the Mid-Atlantic coast. Unlike most public comment opportunities, where the Council requests public input on specific issues, this phase of the project was intended to be a wide-open opportunity for stakeholders to speak their mind. More than 2,000 stakeholders provided input for the Visioning project. As expected, the comments and concerns were diverse, but a large portion of the data revolved around several common themes:

- There is a lack of confidence in the data that drive fishery management decisions.
- Stakeholders are not as involved in the Council process as they can and should be.
- Different jurisdictions and regulations among the many fishery management organizations result in complexity and inconsistency.
- There is a need for increased transparency and communications in fisheries management.
- The dynamics of the ecosystem and food web should be considered to a greater extent in fisheries management decisions.
- Stakeholders are not adequately represented on the Council.
- Pollution is negatively affecting the health of fish stocks.



As the Council nears completion of the second phase of this project, many efforts have already been made to address these stakeholder concerns and ideas. The ongoing strategic planning work related to the Visioning and Strategic Planning project will ultimately identify a variety of ways to systematically organize and utilize socioeconomic information. In addition, as a result of this project, the Council is also engaged in a preliminary investigation of potential tools and techniques to help the Council consider information in a more consistent way at each particular decision point (e.g., structured decision-making, decision matrixes, multidisciplinary models, etc.).

Incorporation of Social and Economic Information

Initial analysis of management programs anticipated that changes in economic welfare (such as changes in income or revenue) were considered adequate measures of community stability and well-being. In recent years, the Council elevated the importance of social and economic analysis in the decision-making process in response to a NMFS policy to conduct social impact assessments. The community profiles developed for the Council in these assessments not only described relevant socioeconomic characteristics of important fishing communities, but also incorporated field interviews with stakeholders regarding the potential actions to be taken by the Council.

In addition, the Council has occasionally contracted out economic analysis of potential management actions due to the specialized nature of the economic methods needed to conduct the needed evaluation. Recently, the Council contracted an evaluation of the current scup allocation system in support of amendment development. The models used in the analysis were developed by consultants in cooperation with staff from the Social Sciences Branch of the

Northeast Fisheries Science Center (SSB).

Council staff currently work with the SSB to prioritize research needs, and improve management plan support provided to the Council. SSB research and products include community profiles, socioeconomic performance measures, voices from the fisheries, social indicators of fishing community vulnerability and resilience, comparative ethnographic analysis, annual cost surveys associated with commercial fishing, and socioeconomic surveys of commercial crew.



Although the Council has always incorporated socioeconomic information into its decision-making process, the use of such information has been limited largely to describing the likely impacts of potentially restrictive management measures on revenues or participation, rather than being used to improve participants' socioeconomic well-being. As a result, over the last four years, the Council has taken a more proactive approach to col-

lecting and utilizing socioeconomic information for decision-making in order to improve socioeconomic outcomes. Several examples are provided below.

Development of Advisory Panel Fishery Performance Reports

The Council's Scientific and Statistical Committee (SSC) began providing recommendations for acceptable biological catch (ABC) for the Council's managed species in 2009 in response to the 2006 reauthorization of the Magnuson-Stevens Act. This was first done for the Atlantic mackerel, squid, and butterfish fisheries, which have limited information about stock abundance and productivity compared to some of the other species the Council manages. In 2010, the SSC considered designating ABCs for squid using an average of recent catch data, and eventually recommended near status-quo quota levels after input from staff and industry.

Following this decision, Council leadership saw a need to institutionalize a way to provide industry input to the SSC for species where minimal biological data was available. In theory, this would help the SSC understand the context of catch histories when such data might be the primary information available for developing ABC recommendations. As a result, the Council established a process whereby the advisory panel (AP) for each species or fishery management plan meets prior to the SSC meeting and develops, with the Council staff, an "AP Fishery Performance Report." This report describes the AP's perspectives on biological and socioeconomic trends in the fisheries and how those trends might be impacting abundance, availability, and catch. The process recognizes that economic decisions and economic factors may directly influence effort and catch, and seeks to systematically incorporate those factors through the AP. It also acknowledges the importance of timely, on-the-water observations of stock and fishery trends, and creates a formal opportunity to incorporate those observations in the quota-setting process. The first of these reports was completed in early 2011 for Mackerel, Squid, and Butterfish, and beginning in 2012 similar reports have been produced for each of the Council's managed species.

The AP Fishery Performance Reports appear to have been useful in several ways. First, SSC members have reported that for data-poor species, the information in the reports has been useful to contextualize catch histories. Second, one or more SSC members typically attend the meetings where the reports are developed, and have reported that attending these meeting helps them to better understand the fishery. Third, the meetings and reports have helped to identify and formally document other management issues that are a high priority to advisory panel members. Often, these other management issues involve concerns or thoughts on how the fishery is managed in the context of biological goals, and seek to improve socioeconomic outcomes within the fishery.

Expansion of Topical Workshops

Building on the stakeholder engagement initiated through the visioning project, the Mid-Atlantic Fishery Manage-

ment Council has expanded the use of focused, topical workshops to address issues within specific fisheries or with specific constituencies. The Council has held two significant workshops in the past year: one to address values and preferences within the region's diverse recreational fishery, and one to explore responsive harvest strategies and other management issues within the longfin and *Illex* squid fisheries.

The Council has used workshops as an opportunity to explore specific issues in-depth with stakeholders in a facilitated workshop setting. The Council typically utilizes a steering committee augmented with advisors or industry leaders to develop the workshop agenda, logistics, format, and participants. This model has proven to be a highly effective method for engaging stakeholders in meaningful discussions about values and other aspects of fisheries that may be elusive during a traditional regulatory meeting. The meetings have been focused on stakeholder input and dialogue and, importantly, have not been framed around any prescribed outcomes.

The recreational workshop, held in Baltimore, Maryland in December 2011, generated a broad complement of recommendations on how the Council can improve its communication with the region's recreational fishing industry, and provided important perspectives on the diversity of the values and desired outcomes within our recreational fisheries. Many of the communication recommendations are being actively incorporated into the Council's communication plan to help the Council reach a broader cross-section of the recreational public, and to improve both the quality and the presentation of information from the Council. Recreational workshop participants represented diverse perspectives but they identified important themes that were broadly held, including the desire to have stability and access within the recreational fisheries. These desired outcomes will be incorporated in the Council's strategic plan, and will inform our decision-making process and regulatory practices.

The Council convened a workshop on squid management in January 2013 in Riverhead, N.Y. The purpose of the workshop was to consider whether responsive harvest strategies are feasible and appropriate for optimizing yield in the longfin and/or *Illex* squid fisheries. Participants included fishermen and industry representatives, representing a range of vessel sizes and geographic locations. The group included many of the advisory panel members for these fisheries in addition to a broader group of fishermen, boat owners, and processors. Other participants included Council members, Council staff, and invited speakers from NOAA Fisheries and the academic and research communities.

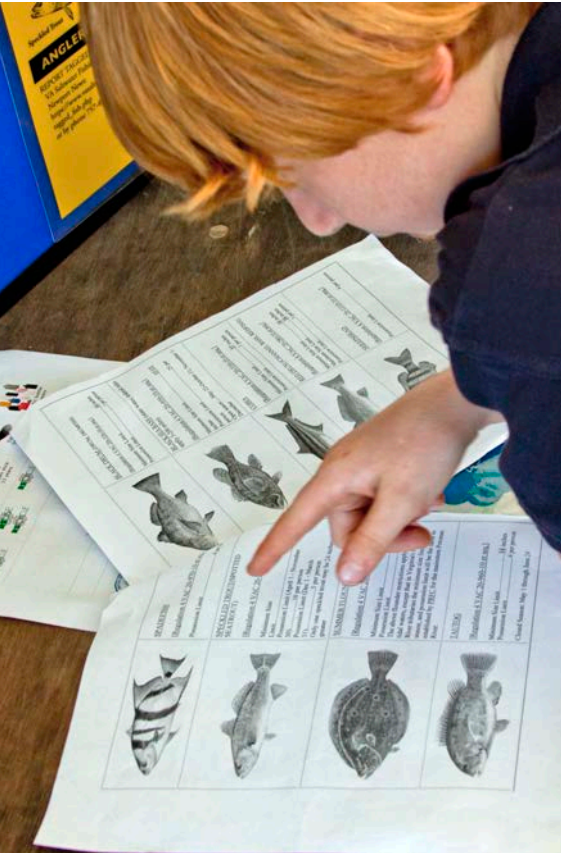


A primary goal of the workshop was to ensure that any potential management changes would have industry involvement from the beginning, since any move toward real-time management would require significant participation by industry in terms of providing data. Secondary goals were to identify shorter-term actions that would enable industry to operate more profitably within current biological restrictions. There has already been additional work and engagement on both fronts so the workshop appears to have been successful. Some participants noted that if similar meetings were held more frequently, additional progress could be made. In that sense, the real value of the workshop may be as a starting point for continued engagement with these fisheries to optimize fishery socioeconomic conditions under the existing management framework.

The Future

The Council sponsored the Fourth National Meeting of the Regional Fishery Management Councils' SSCs which was convened in 2011 to discuss, in part, the role of the social sciences in the SSC and Council processes. This was the first opportunity for the social science members of the SSCs to discuss these issues at the national level. Perhaps the most important conclusion of the workshop was that the collection and analysis of additional social and economic fisheries data should be made a high national priority. Implementation of the Act has tended to focus on achieving the biological objectives of ending overfishing and rebuilding overfished stocks. As a result, SSC discussions and recommendations have focused primarily on biological issues (i.e., the specification of overfishing limits and ABC), while technical evaluation of the social and economic impacts of maintaining or rebuilding fish stocks has played a secondary role during SSC deliberations around the nation.

Workshop discussions revealed a wide range of engagement of social scientists in SSC deliberations across the country, ranging from full engagement in Alaska to little or no engagement in some regions. The group emphasized the need for social scientists to be more fully engaged in the SSC process through review of Council analyses included in annual specification packages, fishery management plans, amendments, and framework actions. Better integration of social science and economics into the SSC process should help guide the Councils toward more effective and balanced decisions that are more fully accepted by stakeholders. Participants also recommended that the Councils and SSCs develop annual terms of reference for considering economic and social science impacts with respect to Council actions and highlighted the need to encourage greater engagement and recognition of communities and community objectives in the fishery management policy process. The SSCs can identify the information needed to appropriately assess community impacts (e.g. community diversity, capital investments, etc.)



A number of best practices would facilitate incorporation of social science information into the Council decision-making process, including: SSC development of social science white papers; development of a social science section in the Council five year research plans; providing peer review of social science models; providing social science training for new Council members; including social and economic sections in Stock Assessment and Fishery Evaluation documents; and including social and economic considerations in ABC specifications through inclusion of effort data in projections. The social science group also recommended that an SSC Social Science Working Group be formed to build on discussions at National SSC IV. Finally, the group identified the development of Ecosystem-Based Fisheries Management goals and objectives by the Councils as a potential point of entry for social science into the SSC process, especially in the context of the development of national ocean policy.

Conclusion

Achieving a balance between biophysical, ecological, and socioeconomic objectives will continue to be a challenging aspect of fisheries management as the Council works to attain a vision of a healthy, responsive, and sustainable future for Mid-Atlantic fisheries. The greatest opportunity for progress can be found in the evaluation of our past successes and mistakes, seeking insight into the challenges of our present, assessing and understanding evolving dynamics within the marine ecosystem, and identifying opportunities for addressing these challenges in the years to come. The visioning and strategic planning

efforts over the last two years have given the Council an opportunity to do just that—identify successes and failures of the past and consider how to translate that knowledge into a better future for our managed fisheries.

The socioeconomic consequences of stock rebuilding have been a dominant concern within the Mid-Atlantic for the past three decades, as quotas were aligned with biological reference points and rebuilding schedules. Looking forward, the Council's managed fisheries face uncharted impacts and consequences associated with climate change and large scale offshore wind energy development. In order to deal effectively with these future challenges, the Council will have to leverage all of its relationships with its management partners and stakeholders, relying on each for their respective expertise and information for possible solutions. Assessing and managing these risks will not happen automatically; rather, it will require diligent planning and close internal and external working relationships at the Council level.

The Council has started on a path to systematically refine and improve the role and consideration of social and economic information in the management process. Based on the strategic plan, it is anticipated that the Council will actively seeking greater stakeholder engagement and involvement in the Council process, set more specific social and economic management objectives, establish more effective review processes for management plans, and improve the transparency of Council operations. Building public confidence in the management process will ultimately require a sustained commitment to excellence and continuous process improvement at the Council level, and a closer engagement with stakeholders throughout the process, from the first point of data collection to final decision-making.



DISCUSSION SUMMARY AND FINDINGS

Session 3 Topic 3

Assessment and Integration of Social and Economic Tradeoffs

Speakers

JIM MARTIN, CONSERVATION DIRECTOR, BERKLEY CONSERVATION INSTITUTE

RICHARD ROBINS, CHAIRMAN, MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

MARTIN D. SMITH, ASSOCIATE PROFESSOR, NICHOLAS SCHOOL OF THE ENVIRONMENT,
DUKE UNIVERSITY

Panelists

RICK ALGERT, HARBOR DIRECTOR, MORRO BAY, CALIFORNIA (RETIRED)

COLUMBUS BROWN, U.S. FISH AND WILDLIFE SERVICE (RETIRED)

DOUG LIPTON, SENIOR RESEARCH ECONOMIST, NOAA FISHERIES SERVICE

SHIRLEY MARQUARDT, MAYOR, UNALASKA, ALASKA

Rapporteurs

KARI MACLAUHLIN, FISHERY SOCIAL SCIENTIST, SOUTH ATLANTIC FISHERY MANAGEMENT
COUNCIL STAFF

CRAIG SEVERANCE, WESTERN PACIFIC FISHERY MANAGEMENT COUNCIL SSC MEMBER,
UNIVERSITY OF HAWAII, HILO

Moderator

MARK HOLLIDAY, DIRECTOR, OFFICE OF POLICY, NOAA FISHERIES SERVICE

Discussion Summary and Findings: Assessment and Integration of Social and Economic Tradeoffs

Annual catch limits and rebuilding programs designed for fish population sustainability often require adjustments to fishing capacity in commercial and recreational fisheries. However, fishing controls to improve biological outcomes can conflict with socioeconomic goals for the fishery. To this point, some biologically-derived management policies limiting catch or effort result in undesirable social and economic consequences. How do we account for these trade-offs and reconcile the different choices facing managers and stakeholders?



Measuring our fishery management performance and its effects on community sustainability requires the integration of social and economic effects of management. Many of these data, however, are currently unavailable. The task is made more difficult because there are many different perspectives of what constitutes the greatest overall benefit to the Nation, and more specifically, what fishing community sustainability looks like. In addition, the oceans on which our fisheries resources depend have many different users, uses and values besides fisheries that NOAA and the Regional Councils have to contend with.

In this session, the speakers and panelists addressed the basis of our current approach to management and science, and asked, are we even posing the right analytical questions? Do we have sufficient data and information to support our stewardship responsibilities? What needs to change in the future? Participants discussed future science and management decisions and how they should influence the data used to evaluate policy decisions.

The following paragraphs highlight major points made by the speakers, panelists or audience. They do not represent consensus, but indicate significant directions for further thought.

Main Messages from the Presentations

This session began with formal presentations by three invited speakers. Each presentation focused on a range of ideas, needs, and observations for improving the sustainability of fisheries in the future.

Find Balance Between Biological, Social, and Economic Objectives

Management decisions should balance biological, social, and economic objectives more effectively. In the late 1970s and early 80s, fishing fleets expanded in the U.S. This caused overcapitalization and overfishing that eventually led to a transition from open access to limited access fisheries. For much of the last 20 years, Councils have focused on rebuilding depleted stocks, often rebuilding multiple stocks at the same time. During this period of simultaneous rebuilding, fishing opportunities were greatly limited. As limits were put in place, it became increasingly difficult for new entrants to join fisheries, and for existing participants to remain in these fisheries. In general, the cumulative effect of these closures resulted in loss of economic resilience for the fleet and coastal communities. This sequence of events forced many fishermen to shift to state-managed fisheries or exit the industry altogether. In the Mid-Atlantic region, for instance, many fishermen who fished for dogfish or summer flounder moved to gillnetting for croaker, or entered the conch fishery, while the “bread and butter” fisheries such as flounder underwent rebuilding. This twenty-year period of rebuilding also destabilized onshore infrastructure and fishing businesses, further reducing

the resilience of fishing communities. In biological terms, these efforts have been largely successful, yet they have come at a cost to commercial and recreational fishermen and the waterfront businesses that support them.

While Councils have been successful at achieving biological objectives, they have been less successful at achieving social or economic sustainability.

This imbalance requires exploration and acknowledgement. Looking towards the future, Councils need to find ways to include social and economic objectives in their decision-making process. Past approaches have focused on how to avoid adverse social and economic outcomes, rather than on how to facilitate more positive outcomes. To do this, more and better socioeconomic data are needed.

However, in the absence of new data collection initiatives, there is also a need to make smarter decisions with existing data. This requires better engagement with stakeholders. Some Councils have been successful in engaging stakeholders to improve management outcomes. Efforts such as industry workshops, listening sessions, real-time and interactive data collection efforts, and visioning processes can all be used to make better-informed decisions. The Mid-Atlantic Council's visioning and strategic planning effort stands out as an example of a meaningful engagement effort. The Council met with industry in small group meetings. These meetings were co-hosted with local liaisons who did peer-to-peer outreach to bring industry stakeholders to the meetings. Council staff sat down and talked with participants about the biggest problems in today's fisheries and what participants wanted to see in the future. This information is being used as the basis for a blueprint for future management fisheries management in the Mid-Atlantic.

Anticipate and Prepare for Major Change

Councils, governments and stakeholders need to streamline management and increase adaptability and efficiency. Fisheries managers and policy-makers in particular need to be prepared for major change in the future. Four major drivers of change need to be acknowledged: population growth and demographic shifts in coastal areas; climate change; increasing demand for seafood; and long-term budget cuts. These drivers will negatively affect fisheries and the nation's ability to manage fisheries as they have been managed to this point. To address these issues, managers and policymakers need to find ways to be nimble, adaptable, and proactive.

Four challenges cited in response to these drivers that require immediate attention were: annual catch limit and species assemblage management, new recreational fisheries management tools, habitat conservation and protection reform, and resource reallocations. The way these issues are dealt with now are ineffective and will be less effective in the future under more uncertain environmental conditions. During the discussion on "Improving Fishery Management Essentials," presenter Dick Brame recommended that recreational fisheries should be managed more like North American waterfowl, adopting a long-term harvest rate, rather than managing fisheries with annual hard quotas.

These new approaches could streamline the current management system and improve conservation outcomes. Issues like these need to be addressed in the short term to unclog the management process and prepare for impending change.

Increase the Use of Economic Valuation in Fisheries Decision-Making

A more prominent role for economic valuations in fisheries decision-making is needed. Economic analyses should be used to help fisheries managers and policymakers make informed decisions about complex and contentious issues such as allocations, optimum yield, and rebuilding timelines. These analyses should focus specifically on assessing the economic tradeoffs of decisions in terms of value, rather than economic impact, to help answer questions like: Do the gains of reduced harvest outweigh the costs? Are lower harvests enough to offset lower revenues? Are profit gains in another fishery enough to offset profit losses?

There is a great deal of confusion about the difference between value and impact. Value is the net contribution of a resource, whereas impact is a measure of gross contribution. These two measures are often correlated. For example, a big impact will also be associated with a large value. However, this is not always the case. This difference was





made apparent by way of an example. The North Carolina shrimp fishery is negatively impacted by hypoxic zones (e.g., areas of low dissolved oxygen). These seasonal zones are caused, in part, by nutrient runoff. During years when large hypoxic zones appear at the confluence of the Neuse River and in the Pamlico Sound, the shrimp fishery decreases by an average of 10-30 percent. This suggests that a hypothetical reduction in hypoxia would increase revenues by \$1.2 million per year. However, reducing hypoxia in the area would only increase the value of the fishery \$0.3 million. Understanding the difference between impact and value is useful because it can help managers make empirically-based management decisions. By incorporating economic valuations into bioeconomic models, fisheries managers and policy-makers can optimize the value of fisheries and more effectively manage towards optimum yield.

Recurring Themes from the Discussion

Following the formal presentations, participants weighed in on a range of topics. The discussion revealed several best practices, gaps in socioeconomic data and modeling, and opportunities for improvement. These are summarized below as a series of short points. The observations do not necessarily reflect consensus or level of priority.

Utilize Legislative Authorities and Policy Tools Outside the Magnuson-Stevens Act

The Magnuson-Stevens Act (MSA) is the primary legislative framework by which Federal fisheries are managed. However, many other legislative authorities positively and negatively affect fisheries. For example, the Endangered Species Act (ESA) has played a critical role in fisheries conservation and management, particularly in the Northwest, where ESA is often lauded for its role in helping to preserve salmon and other economically important stocks. Legislative authorities and policy tools like the ESA need to be more effectively used to address the future fisheries challenges.

Climate change, globalization, population growth and coastal development threats, in particular, need to be addressed through legislative authorities and policy tools outside the MSA. All of these issues pose a major threat to the long-term sustainability of fish stocks and their associated fisheries, but they fall outside the current realm of the MSA.

Establish Mechanisms for New Entrants to Enter Catch Share Fisheries

Catch shares are often used to reduce excess capacity in fisheries. These programs have been largely successful in achieving this goal. However, they have also created new challenges. In particular, unless designed for in advance, catch shares can create an economic barrier to new entrants because the value of quota rapidly increases after privileges have been allocated. To resolve this issue, mechanisms should be put in place to limit consolidation and to help new and small-scale participants gain access to these fisheries. There are many ways to do this. For example, privileges could be allocated to groups of fishermen through Regional Fishing Associations or Fishing Communities as defined in the MSA, or they could be allocated directly to municipalities, coastal towns, and local governments.

Manage Recreational Fisheries like Waterfowl

Despite recent efforts to improve data collection and modeling capacity, many still view recreational fisheries data as unreliable and inaccurate. Collecting recreational fishing data is particularly challenging in the Southeast and Gulf states, where anglers can access fishing grounds via innumerable ports, harbors, beaches, and waterways. The lack of high quality data has major implications for science, and it has also exacerbated the tension over allocation of quota between recreational and commercial sectors. Similar issues have arisen in other sectors of wildlife management and conservation. One way to resolve these issues would be to manage fisheries more like waterfowl, as waterfowl management in the U.S. has a number of similar attributes.

Incorporate Non-Market and Sociocultural Values into Management Decisions

National Standard 1 often takes precedence over other National Standards in the MSA. In practice, Councils determine how to satisfy the biological and ecological requirements that National Standard 1 embodies, and then they choose the alternatives that cause the least direct economic harm to fishing communities. This process tends to ignore non-market and sociocultural values because these qualitative data are difficult to compare to quantitative economic and biological data. To address this issue, emphasis should be placed on incorporating a broader range of data types, including non-market and sociocultural data, into the decision-making process. These forms of data should be described in new guidance on National Standards 2 and 8 (or by creating a new national standard). These data could also be quantified in economic terms and incorporated into bioeconomic models to calculate OY.

Establish a Process to Evaluate Allocation Between and Within Recreational and Commercial Fishing Sectors

Allocations of quota between sectors are typically made to historical users based on past catch history. This approach does not accommodate new entrants, nor does it account for changing social or economic objectives for the fishery or in the broader community. Furthermore, initial allocations tend to be permanent. Rarely are allocation decisions reexamined or quota redistributed between or within fishing sectors, even if strong socioeconomic arguments can be made in favor of change. Part of the reluctance to periodically evaluate allocation decisions is that they tend to be difficult and contentious. To resolve this issue, standard practices should be established to facilitate the review of allocations. These reviews should occur at regular intervals, through an MSA mandate if necessary, and take into account the social and economic benefits of these fisheries.

Strengthen Local Government Involvement

Changes in fisheries regulations and abundance impact marine-dependent businesses, affect economic activity, and alter the marine-dependent infrastructure in coastal communities. These changes affect local governments in a myriad of ways. For example, regulations that reduce fleet capacity may alter a community's tax base or change working waterfront infrastructure. Despite these ties, few local government representatives participate in the fisheries management process. National Marine Fisheries Service and the Councils should work to strengthen ties to local governments. These entities can play a key role in implementing local stewardship and area-based management, translating policy ideas into on-the-ground execution.



Establish a Federal Sustainable Seafood Certification Program

Federal fisheries operate under some of the most stringent management measures that exist anywhere in the world. Regulations are in place to set catch limits, protect habitat, reduce bycatch, and rebuild stocks, yet U.S. fishermen do not get credit for maintaining the world's most sustainable and best-managed fisheries. This perspective has social and economic consequences for the industry. Not only does it implicate fishermen, discounting the burden fishing communities have endured to end overfishing and rebuild fisheries, it has also undercut the value of domestic seafood in some cases. To mitigate these effects, industry has turned to third-party certifiers such as the Marine Stewardship Council, but these sustainability programs can be costly. To demonstrate support for the commercial fishing industry and stand behind the sustainability of current MSA management practices, there should be a government seafood certification program.

Invest in Visioning Exercises to Cultivate Shared Goals

Management actions should be driven by clearly-defined objectives. Fishery management plan objectives are not always explicit or clearly articulated up front, making it difficult to know how to prepare socioeconomic information in a way that is useful to decision-makers faced with making trade-offs. Visioning processes, such as the one conducted by the Mid-Atlantic Council, can be an effective way for Councils to clearly articulate their management objectives.



These exercises also provide an opportunity to engage with stakeholders outside the formal Council meeting process. This can be valuable because it allows Councils to interact with stakeholders in a non-confrontational and non-threatening setting in a familiar locale. Having developed clear Council objectives, social scientists and economists can focus their research and analyses to provide better and more informative research and analyses to the Councils. This will help Councils evaluate their management choices and make the most appropriate decisions.

Capacity Building for Social Science Data and Expertise is Needed

Additional capacity in the social sciences is needed in management, including more anthropologists, sociologists, and economists at Councils, regional offices and states. This will improve support for such processes as allocation reviews, mitigation plans to reduce impacts on fishing communities, scoping of management alternatives with different stakeholder groups, and specifying optimum yield. Collecting appropriate data to support socioeconomic analyses needs to advance beyond the planning stage. Any impediments to collecting social and economic data concerning public trust resources may require evaluation or reform of MSA confidentiality provisions, allowing collection and controlled access to data from public trust resource users while protecting sensitive sources.