

Comments of

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Please enter these comments into the public record of the deliberations of the United States Commission on Ocean Policy, amplifying those already delivered orally by Executive Director Fred Krupp and Ocean Program Manager Doug Hopkins, and augmenting written comments shortly to be delivered by the organization as a whole.

The comments and recommendations provided here are presented from a regional perspective, and based on over twenty-five years spent conducting scientific research and policy work on East Coast, West Coast and Caribbean marine and coastal ecosystems. In addition to my work as an advocate scientist, I also serve as a volunteer state fisheries official (chairing the Permits and Planning Subcommittee of the North Carolina Marine Fisheries Commission's Habitat and Water Quality Standing Advisory Committee), a volunteer federal fishery management official (chairing the South Atlantic Fishery Management Council's Habitat and Environmental Protection Advisory Panel, and serving on its Marine Protected Area Advisory Panel; also serving on the Mid-Atlantic Fishery Management Council's Habitat Advisory Panel), and as an advisor to the National Marine Sanctuary Program (as a member of the Gray's Reef National Marine Sanctuary Advisory Council). I also participate actively in the management activities of the US Caribbean Fishery Management Council, and work on marine ecosystem management in Caribbean Mexico, Cuba, Puerto Rico and the US Virgin Islands.

From that perspective, I make the following observations about the existing governance structure:

1. The coastal and marine ecosystems of the southeastern US and northern Caribbean are critically important, ecologically complex and geographically linked.

The marine environment of the southeastern United States includes stunning shallow-water coral reefs, rocky reefs and sandy shoals where fish aggregate, highly productive marshes and estuaries, and a wide array of other habitats. The region includes nurseries critical to high-biomass cool-temperate fisheries (summer flounder, black sea bass, bluefish, Atlantic menhaden and many others), essential habitats for the reef fishes and migratory fishes of the warm-temperate zone (shrimps, blue crabs, groupers, snappers, mackerel, red drum and many others), and the spawning and nursery grounds of diverse and important tropical ecosystems (snappers, groupers, grunts, and many others). All of these habitats sustain important fisheries, and provide enormous economic benefit to the region.

Many of these habitats are ecologically linked, creating a large – but heterogeneous – marine ecosystem. Adults of some species move great distances. For example, gag grouper tagged off the Carolinas have been recaptured off southwest Florida. In addition, a very high percentage of species use a sequence of habitats as they mature, moving across the continental shelf, and linking shallow-waters to deep-water reefs. Finally, larvae of some species may move long distances from spawning grounds to juvenile and adult habitats. Modeling makes clear that complete rebuilding of some reef fish populations may well require conservation efforts far up-current, in waters of other nations.

2. These critically important ecosystems are increasingly threatened by a combination of water quality degradation, coastal habitat destruction, and overfishing.

Serious threats to the integrity of this ecosystem abound. Rapid development of coastal watersheds has degraded many of the essential near-shore habitats used by these fishes. Marshes, mangroves and other shallow-water habitats are lost to coastal development. Coral reefs and shallow-water rocky reefs are increasingly degraded by beach engineering and related coastal development, by nutrient and other forms of pollution, and by damaging fishing gear.

Intensive fishing has taken a serious toll on reef fishes. Many species are relatively long-lived, aggregating spawners; spawning and pre-spawning aggregations often occur in predictable spots, at predictable times. Some species are sequential hermaphrodites, only becoming male at old age and large size. The largest individuals of most species are also disproportionately important in reproduction. Finally, reef fishes typically have swim bladders (used to control buoyancy), which commonly rupture during the rapid ascents associated with being caught, increasing fishing mortality. Overall fishing impacts have been dramatic: fifteen of the seventeen species of groupers and snappers of known status are classified by the federal government as overfished. The status of the remaining species in the reef-fish complex is largely unknown – though their life histories in many cases make them vulnerable.

Alteration of natural fish community structure also can drive more pervasive and systematic ecological changes. For example, removal of large predatory fishes from reefs can induce population explosions in turf-gardening damselfishes, leading to the overgrowth of corals with turf algae, to the detriment of the entire reef complex.

3. The most serious overall threat to these ecosystems is the fragmentation of management systems.

Coastal management institutions are both fragmented and without adequate resources. Fragmentation exists along both geographical and topical boundaries. These ecosystems extend into foreign waters, where spawning of some species headed towards US waters occurs, and where juveniles of the adults that will spawn are exposed to coastal development and pollution. US federal jurisdiction begins at 200 miles – although US investment in rebuilding efforts could be made even farther afield. State and interstate jurisdictions take over at three (or nine or eight) miles, and extend not only to shore but upstream in coastal watersheds, often with at least some federal oversight. Local units of government typically exert dominant control over land-use in the coastal zone, with varying degrees of state and federal oversight.

Water quality issues are typically managed through state agencies implementing both federal Clean Water Act and related state statutes. Coastal management impacts are typically managed through federal Coastal Zone Management programs and related state legislation. Fisheries management usually includes actions by the Department of Commerce (on advice from federal regional fishery management councils [FMCs]), the interstate commissions, and state fisheries managers.

One example will serve to demonstrate just how complicated this can get. Black sea bass are mid-shelf reef fish as adults, but estuarine as juveniles. Young are directly affected by water pollution (and its management) in inshore nurseries such as Pamlico Sound, as well as coastal development in that area. Fisheries management for black sea bass currently includes management in the Summer Flounder, Black Sea Bass and Scup Fishery Management Plan (FMP) developed by the Mid-Atlantic FMC, management in the Snapper Grouper FMP developed by the South Atlantic FMC, management in the Black Sea Bass Plan adopted by the Atlantic States Marine Fisheries Commission, as well as management by some states individually (e.g., the Federal Species Plan currently being developed by the North Carolina Marine Fisheries Commission). This species is just one member of the guild of reef fishes which frequent the region, and which interact ecologically.

4. Effective restoration of these systems will require the development of a scientifically derived and ecosystem-based management plan.

Efforts to manage this complex ecosystem species by species and sub-system by subsystem are almost certainly destined to fail. The most compelling reason for this is the difference in scale between the management entities and the ecological processes they purport to manage. In addition, extreme variability exists in the political and economic

landscapes upon which decisions are made – and in fact, most decisions remain deeply politicized.

The simple fact remains that – in general – coastal ecosystem management has been a failure: piecemeal changes in landscapes and watersheds threaten overall system integrity, and fishery management failures cascade from species to species.

Examples of fishery management failures are abundant. The current poor status of fish populations as diverse as New England groundfish and South reef fish provides inarguable testimony. Two compelling examples will show similar and continuing (and perhaps catastrophic) failures of management systems for essential fish habitats in the region: Oregon Inlet jetties, and US Caribbean sewers.

The proposed jetties at Oregon Inlet remain a management dinosaur of extreme proportions, yet an unprecedented threat to the most important fish nursery on the East Coast. Simply put, the Corps of Engineers continues to try to obtain clearance to build structures which will do little in the way of safety in whose name they are proposed, but which most scientists feel pose an unacceptable threat to the capacity of fish larvae to pass successfully through Oregon Inlet into the adjacent critical estuarine nurseries. (45 eminent scientists have signed a letter so stating.) Even a minimal read of the EFH provisions of the 1996 Magnuson Stevens Act should have shut this beast down.

EPA just issued waivers against the Clean Water Act's requirement for at least secondary levels of treatment for new and expanded sewer plans in Puerto Rico, which not only threaten shallow-water life history stages of reef fishes, but which will also facilitate new intense coastal development in sensitive areas without adequate controls. While similar waivers were denied for absolutely abysmal plants in the Virgin Islands (largely because they cannot meet even the looser requirements allowed under the waivers), little has been done to eliminate the threats to reef-based fauna from those plants. Simply put: these coral reef-based ecosystems are America's crown jewels. We should be investing our nation's wealth preferentially in solving these problems, and engaging sustainable patterns of coastal development in these places, not treating them as third world locales.

#### 5. Important models exist to help build an integrated coastal and marine ecosystem management system.

It is profoundly ironic that the paradigm being broadly spread through the management arena is that of “integrated coastal zone management.” In almost all cases, the “coastal” aspects of these ecosystems are important, but marginal. A true ecosystem-based management program would trace the fishes from whence they come, and follow them where they go, tying together the various elements into a single unified management system.

While that sounds like a pipe dream (especially given the obvious international entanglements in many parts of the system), the truth is that important management systems are being developed which provide clear models for how to go about this.

One model (at the local scale) is in its early stages in North Carolina, where a watershed restoration plan is being implemented to restore critical spawning habitat for river herring (both a heritage fishery of the region and critical prey for both inshore and oceanic predatory fishes). Phase I of the program was funded to the tune of \$3.28 million by the NC Clean Water Management Trust Fund. (Complementary work has been proposed to protect forever the large floodplain swamps which form the core of the spawning area for this keystone species.)

Another example, at the state scale and also in North Carolina, is the 1997 Marine Fishery Reform Act's requirement to develop and implement a Coastal Habitat Protection Plan, which requires the three pertinent citizen rulemaking commissions to achieve a long-term increase in the value of all coastal habitats to the coastal fishery.

A final and important example is the Essential Fish Habitat protection programs of the SAFMC. The 800-page Habitat Plan, adopted by the SAFMC in October 1998, provides a veritable roadmap for protecting EFH in the region from both fishing and non-fishing based impacts.

Put together and coordinated at the necessary scales, these nested habitat protection initiatives form the basis of a true ecosystem-based restoration and protection model (when combined with the necessary FMPs, also required – at least in theory – by the various fishery management statutes).

Unfortunately, although these efforts are being designed by among the most committed and creative environmental management officials in the country, they remain piecemeal and incomplete, given the array of political boundaries which must be crossed for them to be completely successful.

#### 6. Marine Protected Areas (MPAs) will be an essential component of an effective ecosystem-based network in the Southeast.

The characteristics that increase vulnerability to fishing also enhance the likely value of MPAs. Restoration of reef fish populations requires protection of spawning aggregations in larval source areas, and protection of the full range of juvenile and adult habitats. Eliminating fishing in spawning areas would generate more and larger fish, with greater reproductive capacity, which can then spill over into adjacent fished areas and also re-seed down-current areas. Accidental mortality among species prohibited from capture can also be reduced.

If properly designed and coordinated with more traditional management approaches, MPAs could be the key to restoring the reef-associated fisheries of the Southeast. We believe we have laid the foundation to put in place the first science-based network of MPAs in the world to operate at the large-ecosystem scale for reef-fish populations.

In December 2000, after two years of hard work, the SAFMC adopted a two-phase approach to MPA implementation, and a set of criteria to guide the process. Phase I would focus on the severely overfished deep-water grouper complex (snowy grouper, Warsaw grouper, yellow-edged grouper, speckled hind and three tilefishes); Phase II would address MPA needs of the rest of the complex, across the shelf to shallow water.

After another year of grueling technical and political work, the SAFMC adopted in December 2001 the specific network of deepwater sites to go forward through the public review process as Amendment 14 to the Snapper Grouper Fishery Management Plan. The proposal includes a dozen sites covering more than 700 square nautical miles, located from NC to Florida, on the shelf break, in high value habitats. (Amendment 13 is also going forward, including a proposal for a spawning-season closure to help protect the integrity of the MPAs, once adopted.) The SAFMC has proven itself a leader in the development of tools of this type.

I believe the fishing public is in for a rude shock when the obligations for reducing fishing mortality which currently exist are translated into numeric terms during the development of Amendment 13 to the Snapper Grouper FMP. MPAs provide perhaps the best hope for the reef fish of the region, and among the least painful ways to get to acceptable levels of fishing pressure.

7. True ecosystem-based management will require the development of a new entity charged with its design and implementation.

The current mosaic of coastal and marine resource management has failed. Good people are trying to do good things with inadequate tools – tools which in many cases create incentives for the adoption of measures destined to fail. The best models created by managers should be synthesized and integrated, creating a wholly new management regime based on the best of the current generation.

One obvious solution would be to empower regional interstate ecosystem protection commissions charged with rebuilding and protecting these ecosystems. The fundamentally economic (and sometimes ugly) business of allocating fisheries could still be managed through a regional FMC charged with that job – but the fundamental job of assessing the capacity of systems to produce organisms for harvest or other use should not be determined by resource users.

Although the real world is a crazy mosaic of organisms and their life histories, the fundamental ecological units in the marine world seem to make sense as a place to start: the boreal marine ecosystem (roughly the Gulf of Maine), the cool temperate ecosystem (roughly Cape Cod to Cape Hatteras), the warm temperate ecosystem (roughly Cape Hatteras to Jupiter), the tropical Atlantic ecosystem (south Florida and the US Caribbean, with a place-holder built in for upstream ecosystem components), the Gulf of Mexico, plus West Coast equivalents.

It is obvious that those break points come pretty close to matching the jurisdictions of the current FMCs – not a real surprise. The difference would be the resource-first charge of the commissions. Melding interstate management into the same structure could help obviate the three-mile boundary problem. (Obviously, states would be key players, as they are now – it’s just that the game would be different!)

8. Up-current needs must be addressed.

In the final analysis, success in ecosystem-based management cannot be achieved in US waters alone. While it seems unlikely that any international body could ever be formed to actively manage a wide marine ecosystem, the US is blessed with economic tools not yet deployed (and almost certainly with some not yet even dreamed of) which could help to ensure the long-term health of US marine ecosystems. While the political complexities are great, huge opportunities exist to build alliances with upstream partners for integrated conservation.

9. World class resources require world-class management systems.

The bottom line remains that the US Southeast is blessed with spectacular marine resources, and with great environmental leaders. Nonetheless, increasing population pressure and ever more intense use of terrestrial and aquatic resources make clear that the status quo cannot protect these resources for the long term. Rebuilding this complex and broad ecosystem, and protecting it for our grandchildren’s enjoyment, will require the implementation of a new management system which takes advantage of the strengths inherent in the federalist governance system, but which integrates those strengths into a cohesive and ecosystem-based approach that addresses all three legs of the fisheries “stool” at the same time: coastal water quality, fisheries habitat protection, and sustainable harvest.