Sea Grant New York

SPORT FISHING INDUSTRY NEWS

Newsletter for Angling & Charter Boat Communties *Winter 2001/2002*

MPA Myths & Concepts

Antoinette Clemetson, New York Sea Grant

We participated in the inaugural Invitational Marine Protected Areas Education Workshop sponsored by NOAA National Marine Protected Areas Center (MPAC) in late Fall 2001. Many of our readers may be unfamiliar with the Center, since it was created less than a year ago from Executive Order #13158 under former President Bill Clinton's administration. The MPAC will serve as a clearing house for information and resources for issues related to marine protected areas, and its headquarters is supported by two offices — Institute for MPA Science located in Santa Cruz, CA, which will focus on research and developing tools and strategies for building a national marine protected areas system. The other facility is the Institute for MPA Training and Technical Assistance in Charleston, SC, which will provide training opportunities and technical support for managers, citizens, and others involved in MPAs (i.e., 'training-the trainers'). An extensive information base already exists at the official website (URL http://www.mpa.gov), where users can access the MPA data-

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INSIDE THIS ISSUE

Putting No-Take Marine Reserves in Perspective

Mark Tupper, University of Guam

Many scientists agree that tropical fisheries in developing island nations, such as St. Lucia, stand to gain the most from no-take marine reserves. Many of these island fisheries are seriously overexploited and have little or no management of their reef fish stocks. In such cases, where no-take marine reserves are established they serve as the primary (in some cases sole) controls of catch and effort. It seems obvious that many management regime will produce increased yields over no management at all, and for developing tropical nations with several hundred or more species of reef fish, no-take marine reserves might be much easier to enforce than a complex set of catch limits, size limits, and gear restrictions. However, the St. Lucia example is specific to coral reef fisheries and does not prove the global utility of no-take marine reserves to fisheries.

The Florida Fish & Wildlife Conservation Commission instituted stringent regulations on the recreational fishery for red and black drum and spotted seatrout in the late 1980s. Red drum was declared a protected species in 1985 and black drum was declared a restricted species in 1989. Currently the bag limit for red drum is one fish per person, with slot limit of 18-27 inches long. The Merritt Island NWR is producing trophy-size fish to a small area around Cape Canaveral, but what effect have the existing regulations had on mean sizes of red and black drum along the entire Florida Atlantic coast?

Data collected by the Marine Recreational Fisheries Statistics Survey (MRFSS) show that there was noticeable increase in mean length and weight of red drum and black drum in east Florida over the past 20 years. For black drum, the mean weight was less than 1.0 kg for most of the early 1980s but was 2.0 kg in 2000 and again in 2001. Mean weight of red drum also increased from less than 1.0 kg in the early 1980s to a mean of around 2.0 kg through the late 1990s and 2000, reaching a mean of 2.2 kg in 2001. This

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bases, and download useful information about MPAs. So what do scientists mean when they use the term **marine protected areas**? MPAs come in many sizes and shapes, but the classical definition by the World Conservation Union (IUCN) is "any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical or cultural features, which has been reserved by law, or other effective means, to protect part or all of the enclosed environment". MPA-wide restrictions may include such activities as oil and gas extraction with higher levels of protection on delimited zones, designated as fishery and ecological reserves within the MPA.

Many people consider MPAs as another kind of fishery closure; however, ecologists view them as distinct because they serve different objectives. Most importantly, fishery closures are often considered to be reactionary, and they are typically initiated as a means of temporarily addressing a fishery problem, focusing on one species at a time. Fishery closures are used to address ill symptoms including low catch rates, excessive by-catch, declining size-at-first-capture, etc. MPAs, on the other, are viewed as a proactive means to facilitate the long-term view of maintaining the marine ecosystem's health in future. Typically, MPAs are tools used in multi-species management, placing emphasis on an area and the entire ecosystem contained within (see Box A for examples), and may subsequently be comprised of several entities.

Box A: Examples of Marine Protected Areas

1. National Parks & Seashore
2. National Monuments
3. National Wildlife Refuge (i.e., non-consumptive uses)
4. Restricted Access Zones (e.g., space launch buffer zones)
5. Fishery Management Zones (Area Closures)
6. National Marine Sanctuaries
7. National Estuarine Research Reserves
8. Critical Habitats

This brings our attention to the subject of a **marine reserve**, which is often defined as a zone in which some or all of the biological resources are protected from removal or disturbance. This includes marine reserves established to protect threatened or endangered species and specific categories of fishery and ecological reserves. Marine reserves (along with its many variations) represent one type of MPA.

A **fishery reserve** is a zone that precludes fishing activity on some or all species to protect critical habitat, rebuild stocks (long-term, but not necessarily permanent, closure), provide insurance against overfishing, or enhance fishery yield.

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An example is Closed Areas I and II on Georges Bank, implemented to protect groundfish.

Ecological reserves are zones that protect all living marine resources through prohibitions on fishing and the removal or disturbance of any living or non-living marine resource, except as necessary for monitoring or research to evaluate effectiveness. Access and recreational activities may be restricted to prevent damage to the resources. Other terms that have been used to describe this type of reserve include "no-take" and "fully-protected" areas, The Western Sambos Reserve in the Florida Keys National Marine Sanctuary provides an example of this type of zoning. Many stakeholders often interpret this term to mean 'no-people', but they generally do not limit non-consumptive activities that occur at non-damaging levels. For example, people may be allowed to participate (within acceptable limits) in activities such as swimming, scuba diving, snorkeling, recreational boating, shipping, etc. Fully protected marine reserves are a precautionary, ecosystem-based approach to management.

Another useful term is **marine preserve**, which excludes all human activities, including those of a scientific, commercial, and recreational nature.

Ecologists have stated that there are many benefits to be gained from fully protected marine reserves. In summary, these benefits include:- enhancing the production of offspring which can restock fishing grounds; spillover effects of adults and juveniles into adjacent fishing grounds; providing refuge for vulnerable species; maintain biodiversity by promoting development of natural biological communities that are different from those in fishing grounds; facilitate recovery from adverse human impacts and natural disturbances (e.g. habitat damage).

Spillover Effects and Recruitment

Roberts *et al*., in their *Science* article described the basis for the spillover effect as such:

"Because reserves contain more larger fish, protected populations can potentially produce many times more offspring than can exploited populations. In some case, studies have estimated order-of-magnitude differences in egg production. Increased egg output is predicted to supply adjacent fisheries through export of offspring in ocean currents. In addition, as protected stocks build up, reserves are predicted to supply local fisheries through density-dependent spillover of juveniles and adults into fishing grounds" (Roberts *et al.*, 2001. *Science* 292, 1920-1923). This concept has been debated within the scientific community for many years, because there was doubt as to whether the windfall in adjacent areas was a result of

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enhanced recruitment due to increased production, or, whether it was a case of fish emigrating to new areas. Research results are now available to support positive changes in recruitment levels for protected species.

Network Reserves

Ecologists emphasize the importance of networking reserves. The distribution of living marine resources is governed by environmental parameters (rather than arbitrary boundaries), and populations of organisms interact over distance. Fish larvae and adults need to be exported to other areas (i.e., dispersal), and this is a mean by which geographical areas are connected. The theory is that creating a large number of small reserves will provide greater connectivity (and production) than a few large ones, because the distance between reserves will be less. Often, ecologists recommend creating a network of reserves that serve to address a larger proportion of the pelagic dispersal phase of the fish's lifecycle. Networks are viewed as being useful in situations where the fish stock exhibits open population dynamics, and dispersion occurs over a large distance. Isolated reserves have many benefits, but they are believed to protect a limited fraction of marine biodiversity. They are also useful if the fishery relies on larvae and adults from within the same locality (i.e. self-recruiting), for example on a coral reef.

Fully protected marine reserves may have trade-offs. The most obvious being the socio-economic impacts resulting to displaced stakeholder groups, which might include commercial and recreational users. These adverse impacts demand stakeholder involvement in the process in order to make fully protected marine reserves work. If there is no alternative option (or compromise) available to the users, they will oppose these measures; this is especially applicable in situations where the users have economic dependence on the resources. The most successful reserves are those where benefits of the reserve creation are fed directly back into local communities and help compensate those whose livelihoods have been affected.

The level of success realized in an MPA is related to enforcement, and government agencies have traditionally taken on these responsibilities. However, with dwindling resources to properly implement and maintain protection, and locals' suspicion of top-down control, make this job extremely challenging. Community-based management offers an alternative to traditional enforcement, but it requires strong commitment from the stakeholder groups in order to work.

In conclusion, MPAs should be viewed as being a 'tool in the toolbox' — they are conservation tools that, when used with other management tools, can benefit the marine life within their boundaries, and as a result, also benefit coastal communities.

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Defining the goals and objectives from among the myriad that exist is a prerequisite for determining the appropriate level of protection for an MPA. Decisions regarding size, location, and linkages between MPAs and other components of ecosystems must be considered.

Further Reading:

Callum M. Roberts and Julie P. Hawkins 2000. Fully-protected marine reserves: a guide. WWF Endangered Seas campaign, 1250 24th Street NW, Washington, DC 20037, USA Environment Department, University of York, York YO10 5DD, UK. 131 pp.

Report of the Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, National Research Council. 2001. Marine Protected Areas: tools for sustaining ocean ecosytems. 288 pp.

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shows that, whereas an MPA can provide trophy size fish to a limited area outside its boundaries, traditional fisheries management techniques can result in size increase across the entire fishery.

Although the examples discussed by Roberts *et al*. demonstrate the potential benefits of marine reserves to fisheries, the fact is that the great majority of them have not succeeded in meeting their management objectives, even in tropical coral reef systems. Indeed it is rather surprising that the fairly abysmal performance of MPAs has been the basis for a global movement towards marine reserves for fisheries management. Current estimates place the number of "paper parks" at over 80-90% in some countries, and rich nations have fared no better than poor ones. Rather than charging ahead to cerate hundreds of new MPAs, it makes sense to determine (1) whether or not a no-take marine reserve is the best management strategy for a particular fishery, and (2) how we can better implement and manage current MPAs so that they reach their stated objectives.

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Marine Recreational Fishing Regulations

The following table lists the revised regulations for marine recreational that were posted in the October 4 Edition of the NYS Registry. The changes were necessary to maintain New York State's compliance with Atlantic States Marine Fishery Commission Fishery Management Plans (FMP). Note: The regulations were compiled as a service of New York Sea Grant Extension Program; New York Sea Grant and Cornell Cooperative Extension do not assume any liability associated with the reproduction of the information. Anglers should refer to official DEC documents or contact New York State Department of Environmental Conservation at 1-800-REGS-DEC or visit the website at http://www.dec.state.ny.us/website/dfwmr/swflaws.htm to obtain up-to-date information.

Species	Minimum Size Limit (ins)[a]	Open Season	Daily Bag Limit
American Eel	6	All Year	None
American Shad	None	All Year	6 fish per day
Atlantic Sturgeon		MORATORIUM	
Black Sea Bass	11	May 10 - Feb 28	25
Bluefish	None	All Year	10 fish per day
Cobia	37	All Year	None
King Mackerel	23	All Year	3 fish per day
Monkfish (Goosefish)	17 11 (tail length)[b]	All Year	None
Pollock	19	All Year	None
Red Drum	14	All Year	2 fish (>32 inches) per day
Scup	9	Jul 1 - Nov 17	50 fish per day
Spanish Mackerel	14	All Year	10 fish per day
Striped Bass	28 (marine district) 18 (North of GWB)[c]	May 8-Dec 15	1 fish per day
Summer Flounder	17	May 2-Oct 31	7 fish per day
Tautog	14	All Year	1 fish per day (June 1-Oct 6) 10 fish per day (Oct 7-May 31)
Weakfish	16 10 (fillet)[d] 12 (dressed)[e]	All Year	6 fish per day
Winter Flounder	11	March- June 30 (3rd Saturday) & Sept 15-Nov 30	15 fish per day
Yellowtail Flounder	13	All Year	None

[a]Length refers to Total Length, unless stated otherwise. Total length is determined by squeezing the lobes of the tail together, then measuring the distance between the tip of the snout and the tail.
[b]Tail length is the distance between the tip of the tail and the fourth cephalic dorsal spine (assuming all spines remain intact).
[c]George Washington Bridge.
[d]Fillet length is the distance between the ends of the fleshy portion of the fish, measured lengthwise; fillet must have skin intact.
[e]Dressed length is the distance between the ends of the anterior part of the fish (with its head removed), and the tip of the tail

On the Need for the Study of Indigenous Fishers' Knowledge

Bob Johannes

Indigenous fishers often possess unique and important knowledge about their local marine environments and its inhabitants. In areas where the same cultures have been fishing for generations, this knowledge can be encyclopedic. Fishers often know, for example, the timing and location of important and especially vulnerable life history events such as migratory and spawning aggregations, recruitment and nursery areas, of the locations of rare endangered species.

How can we design effective boundaries for marine protected areas in developing countries in the absence of such knowledge?

For fisheries managers, for whom knowing the history of a fishery is essential for its management, the elders in these communities are often the only repositories of such information, including knowledge of once abundant species. Without such information, the biologists arriving on the scene to help is liable to assume that such species are unimportant locally and ignore them, rather than determine what depleted them and how the process might be reversed. Yet how many biologists have seriously solicited this knowledge?

For social scientists, fishers can provide knowledge of how this information is implemented in organizing their fisheries by means of formal or informal systems of allocation. Fishers can also teach us about human impediments to purely biological solutions to resource management problems. For example, simply passing laws against destructive practices is futile if endemic police, military or political corruption renders them ineffective – a point that has been overlooked on countless occasions by those working to improve coastal resource management in developing countries.

We can also learn from fishers whether their communities possess a basic conservation ethic. Sometimes they do, sometimes they don't. This makes a big difference in how education for conservation should be approached. Where a conservation ethic exists, the relevant concepts need to be studied and used as the foundation for local conservation education. Where they do not exist, conservation education is much harder, for it has to start from scratch. So why has there been so little research emphasis on indigenous fishers' knowledge? Answers include:

1. Most biologists working on such coastal management projects are too busy gathering statistics, their usual stock and trade. They find asking unlettered

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people about their marine biological knowledge too humbling, too unstructured and too unsuitable for statistical analysis.

2. Social scientists working in co-management projects often don't have the biological training necessary for the effective collection and application of indigenous knowledge about natural resources.

As fisheries biologists Frederick Ommaney said almost 40 years ago, the indigenous fisher "has forgotten more about how to catch fish in his waters than we shall ever know". How can we generate enthusiasm in local fishers for collaborating with us, and how can we function as plausible and useful advisors if we don't assimilate this local knowledge, test it where practical, and integrate it with our own? Fishers and outsiders who pursue co-management are both experts. Each group has specialized relevant knowledge that the other does not. Both must be harassed to improve local fisheries management.

The time is thus overdue for the establishment of centers for the study of indigenous knowledge of fishers and other coastal resource users. Their invaluable knowledge is vanishing at accelerating rate as its possessors die and their children no longer show interest in learning it. Of 37 formal institutions established worldwide to study indigenous knowledge, none focuses on marine knowledge.

Institutions are urgently needed to train people to help stem this loss. The demand is there; graduate and post-doctoral students regularly ask me where they should go to get training to do research in this area. (The young seem much more eager to tackle unconventional interdisciplinary projects like this than previous generations). But sadly, I don't know what to tell them.Such a center must be truly interdisciplinary. Social and biological science must play important roles. Traditional ecological knowledge is best understood, and local resource management best pursued, in a cultural context. Biologists need to comprehend the implications of this for their work. Social scientists need some training in marine biology and marine resource management in order to fully appreciate the practical significance of the information they obtain. Ethical issues regarding the use of fishers' ecological knowledge need to be better defined.

For charitable institutions, universities, aid organizations and agencies concerned with environmental issues and looking for an empty niche to fill, here is one to consider.

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Bob Johannes is an Australian-based consultant on marine resource management issues, including the use of traditional ecological knowledge.

Defining Goals & Purpose in Marine Wilderness Areas

David Conover and Malcolm Bowman, Stony Brook University

Marine Wilderness Areas are defined as protected areas where there are minimal disturbances to the natural environment from human activities, while permitting non-consumptive and compatible uses. Their ecological benefits might include increasing biodiversity, raising biomass, protecting important life history functions and guarding endangered species. Areas that have this level of protection could provide for habitat restoration and control areas for scientific research. They can offer educational tourism and wildlife viewing and enjoyment. In simple terms, they can be thought of as national or state parks underwater.

Never before in the history of U.S. resource management has any idea gained momentum as rapidly as than that of marine protected areas. Yet the idea of marine protected areas is not new. Areas closed to certain types of fishing have been part of fishery management for decades. What is different now is the call for creation of "no take" marine reserves — where virtually any harvest or activities harmful to marine life is prohibited. The causes of this outcry for marine reserves are many including overfishing, degraded ecosystems, bycatch of non-targeted species, increased recognition of species vulnerable to extinction, and habitat damage caused by fishing and boating gear. Whether these complaints are valid or not, it is clear that the issue of no-take marine reserves is not going to go away quietly. The purpose of this conference was to begin a debate about the pros and cons of MPAs as a marine resource management tool in NY state waters.

Fishery enhancement is most often marketed as the greatest benefit of marine reserves – in part because it would appear to represent a "win-win" alternative for all stakeholders. Yet for most species, this objective is not likely to be an achievable by NY State acting alone. Modeling studies show that to be effective as a fishery management tool, fishery reserves would have to be very large – i.e., up to 20-50% of a species range. Moreover, for species that are highly dispersive at certain life stages (e.g., egg or larval period) or are highly migratory, at vast network of reserves will likely be required. Because nearly all of New York finfishes undergo extensive seasonal migrations well beyond the boundaries of New York State waters and including much of the U.S. east coast, coordination of reserve implementation with many other states and federal agencies would be necessary. While that may be a worthwhile direction for the future, the focus of this conference is on the use of MWA (s) for purposes of preserving pristine natural conditions in a fraction of New York's state waters. Where reserves have been put into place they appear to lead to rapid increases in abundance and biomass, according to a recent National Research Council Report (NRC, 2001).

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Box 1: Effects of marine reserves
[as cited in NRC (2001) "Marine protected areas….."]

- 69% of studies (n-76) found increases in abundance of residents (avg. 2-fold)
- 88% found an increase average body size of fish (avg. 1/3 increase)
- 92% found increase biomass (avg. 2.5 fold)
- 59% found increase species richness

Caution should be urged in interpreting these results. Some have argued that increases in abundance and biomass alone are sufficient to prove the success of reserves. But the fact that fishes increase when you stop fishing them is not surprising — in fact its exactly what you would expect under a successful fishery management plan which aims to maximize productivity (=yield) over time not the current population biomass.

Even if reserves are successful the costs of creating and maintaining them deserve serious consideration.

Box 2: Costs of marine reserves

- Loss of open access
- Loss of freedom
- Displacement of fishery
- Enforcement
- Management
- Disproportionate economic loss to bordering communities

Many goals can be established for Marine Wilderness Areas, but stakeholders must consider the full extent of its impact and issues related to their development. See Boxes 3-6 for the types of issues that were considered by participants at the meeting. The meeting proceedings are being prepared and readers are encouraged to visit the website at http://www.msrc.sunysb.edu/pages/news&ev.html for further details.

Box 3: Biological Issues

What populations, species, or habitats are mostly likely to benefit from Marine Wilderness Areas? How might a wilderness area assist in the protection/management of, for example:

1. Threatened or endangered species: invertebrates, vertebrates, plants
2. Harvested resources
    a. Finfish
    b. Shellfish
3. Resident vs seasonal migrants
4. Unique habitats
5. Species of special concern or ecological importance
6. Overall biodiversity

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Box 4: Research Issues

1. What research needs to be done to evaluate the potential effectiveness and siting of MWAs?
2. Would the creation of MWAs foster and enable new research of value to the State of New York? If so, how?
3. Could the effect of a MWA on marine living resources be evaluated scientifically, and if so how?
4. Can we use terrestrial wilderness areas (e.g. state and national parks) as role models for MWAs?

Box 5: Political/Legislative Issues

1. What are the existing alternatives for creating protected areas of various forms and how many are already in place?
2. What are the potential legislative avenues for creating MWAs?
3. What are alternatives to creating MWAs (e.g., marine zoning)
4. What are likely to be the main sources of support and opposition to MWAs and, if proposed, how might differences in public opinion about MWAs be resolved?
5. How could issues of overlapping jurisdiction be resolved?
6. How might scientific understanding undergird and inform public policy with respect to MWAs?
7. Can we use terrestrial wilderness areas as an analogy to MWAs?

Box 6: Societal Issues

What are the appropriate uses and long term benefits and drawbacks to society of MWAs?

1. Economic
2. Aesthetic
3. Educational
4. Recreational
5. Can we use terrestrial wilderness areas as an analogy to MWAs?

David Conover and Malcolm Bowman are professors at the Marine Science Research Center at Stony Brook University.

Community News

LIS Lobster Health Symposium

The 2nd Annual LIS Lobster Health Symposium was held last November to discuss the current status of research and causes of the lobster mass mortality that occurred in 1999. The audience was comprised of lobster fishers, resource managers, biologists, environmental advocates and the general public with an interest in LIS. The presentations included estimates of lobster production in 2001 by state regulatory agencies, preliminary findings in paramoeba research, sediment analysis, and the social impacts that resulted from the events. Please contact New York Sea Grant Extension at 631.727.3910 for more information.

ASMFC Recommendations for 2002

Anglers will be pleased to now the ASMFC recommended increase in quotas for three species:- summer flounder, scup and black sea bass. For summer flounders, the new total allowable catch (TAC) is 9.72 M lbs, accompanied by state-specific management measures (i.e. for bag limits, minimum size and seasonal closure). TAC for scups will be 2.71 M lbs, with continued state-specific measures. New TAC for black sea bass is 3.64 M lbs. Please contact the ASFMC at 202.289.6400 or NYSDEC for details.

Marine Reserves

The Marine Sciences Research Center, Stony Brook University, hosted the First regional Marine Wilderness Workshop last November. The purpose of the workshop was to explore the nature of marine wilderness areas, and what role they might have in the management of regional marine resources. Regional is meant to include New York State and nearby coastal states, but with an emphasis on our State's coastal and estuarine waters. Malcom Bowman, Workshop Chairman stated "our goal was not to advocate for or against the creation of marine wilderness areas per se, but rather to objectively and rigorously evaluate their pros and cons as a tool in managing the interaction between humans and the marine environment." Details of the discussions will be presented in the final report (see article in this issue).

Sea Grant
New York

New York Sea Grant is part of a national network of universities meeting the challenging environmental needs of the coastal ocean and Great Lakes region. This program is unique among the 30 nationally funded programs because it includes marine and Great Lakes shorelines. New York Sea Grant engages in research, education and technology transfer to promote understanding on sustainable development, utilization, and conservation of our diverse coastal resources. New York Sea Grant facilitates transfer of research-based information to a great variety of coastal user groups that include businesses, federal, state and local government, decision-makers, resource managers, the media and the interested public. Visit our web site at http://www.nyseagrant.org

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Editor's Note:
Happy New Year! There was such a resurgence of interest in Marine Protected Areas last year, we decided devote this issue to topics that will help our readers understand the terminologies and concepts behind these management entities. The views expressed in the articles do not represent New York Sea Grant's position, and that are meant to convery information to our readers.

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