

**RECREATIONAL FISHERMEN'S PERCEPTIONS
OF MARINE PROTECTED AREAS**

**by
TONI KERNS**

Date: _____

Approved:

Dr. Dan Rittschof, Advisor

Dr. William H. Schlesinger, Dean

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ABSTRACT

Apparent failure of traditional management approaches to stall declines of economically important fish populations has led to new management approaches including marine protected areas (MPAs). Recreational organizations and associations are not pleased with management's proposed use of MPAs. A pilot study was conducted to address the perception of recreational fishermen including the level of awareness of MPAs among recreational fishermen and their attitudes and concerns towards MPAs. My findings show the majority of recreational fishermen are in support of MPAs but have reservations with no-take areas. The respondents were knowledgeable in the benefits of MPAs but incompletely understood the designation process. I recommend that managers devise an outreach plan to educate recreational fishermen about MPAs and help to open a dialog with this user group and conservation groups on how to best employ MPAs to address both conservation and recreational fishing needs.

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INTRODUCTION

What is a Marine Protected Area?

Marine protected areas (MPAs), marine reserves, ocean wilderness...what does it all mean? The concept of marine protected areas is not a new topic; it has been around for centuries. MPAs have come to mean different things to different people, depending on the use of the area. Some view MPAs as restricted areas where little, if any, use or human disturbance should be permitted. While others see them as managed areas constructed to improve sustainable ocean use. All terms refer to limiting access to specific areas of the ocean – a type of ocean zoning.

MPAs are areas of the ocean that have been reserved by laws or regulations to provide lasting protection of part or all of the natural and cultural resources therein. Marine protected areas define a zone of ocean with any level of restricted access. MPAs can range widely in size, location, and level of protection. Some areas are small, such as the 14-acre Farnsworth Bank Ecological Reserve in California, while other larger, the Monterey Bay National Marine Sanctuary in California covers 5,300 square miles (NOAA MPA Center, 2002). Federal agencies manage MPAs found exclusively in federal waters (including waters 3miles from the coast out to 200 miles, with the exception on Florida's west coast and Texas which include waters 9 miles from the coast out to 200). While both state and federal laws can apply to MPAs found only in state waters (including waters from the mean high tide of the shore to 3miles out, with the exception on Florida's west coast and Texas which include waters from the mean high tide of the shore to 9 miles out). MPAs can also overlap, such as Channel Islands National Marine Sanctuary and Channel Islands National Park share jurisdiction over some ocean waters (NOAA MPA Center, 2002). Lastly, MPAs can include both marine and land components as such as the Cape Cod National Seashore in Massachusetts. MPAs range from areas closed to public access, such as Crocodile Lake National Wildlife Refuge in Key Largo; to sites that permit access but prohibit consumptive uses, like Edmonds Underwater Park in Washington; to areas where specific types of fishing gear use is restricted as in Florida Keys National Marine Sanctuary (NOAA MPA Center, 2002).

Purpose

The consideration of MPAs as a fisheries management tool has created much tension between managers and recreational fishermen. Recreational fishermen have led the fight to conserve America's marine fisheries. The combined conservation efforts of recreational fishermen, conservation advocates, and managers have led to the recovery of striped bass, weakfish, redfish, and Atlantic shad. Recreational anglers have worked alongside, and inside, the existing State and Federal fishery management systems using all of the traditional fishery management tools - size limits, quotas, seasons, and, where appropriate, area closures - to recover our fishery resources from past periods of overexploitation. Science currently shows that traditional management tools may not be enough to help recover some of our fish stocks (Botsford et al, 1997, Jackson, et al, 2001). Recently, managers have proposed to create a network of no-take MPAs to manage failing fish stocks. The recreational fishing organizations, such as the Coastal Conservation Association, do not agree that there is a scientific consensus to support MPAs and thus question management's use of MPAs (Freedom to Fish, 2003).

To address the conflicts between managers and stakeholders and to advise the fisheries decision makers, this paper will assess the level of awareness of MPAs among recreational fishermen and the attitudes among recreational fishermen towards MPAs. I will also explore the user group's perceptions of the effectiveness of MPAs. The results will provide guidance in devising an outreach plan to educate recreational fishermen about MPAs and help to open a dialog among recreational fishermen, conservation groups and management on how to best employ MPAs to address both conservation and recreational fishing needs.

Background of Recreational Fishermen

Historically, commercial fishers have received the brunt of the blame for overfishing problems in the US. This is due in no small part to recreational fishers arguing quite successfully that the total recreational fishing take is so small it does not matter compared to that of the commercial fishing. According to the National Marine Fisheries Service, NMFS, Recreational anglers land only 2 percent of all marine fish taken from US waters (Freedom to Fish, 2002). However, a closer look at some species

stocks statistics published by NMFS suggests that recreational take is at least as important factor in stock health as the commercial take for a number of stocks (Coleman and Crowder, 2002). Gag grouper and red drum are examples of a species for which recreational take is at least or the most important factor on the species stock health.

This initial 2 percent analysis by NMFS ignores the fact that most of the recreational catch concentrates on top level predators rather than foraging species. While the commercial fishery is almost solely responsible for the intense fishing effort expended on the lower levels of the trophic web and ecological problems that coincide with that, the recreation sector has considerable impact on a suite of species at the top and thus may play a significant role in stock depletion and/or the success of rebuilding plans, as well as contribute to possible ecological problems relating to cascading trophic events (Coleman and Crowder, 2002). By showing that a species is being harvested significantly by recreational anglers, it is possible that management programs and other public policy initiatives will include the impacts of recreational anglers in their management plans and policy decisions.

Economics of Recreational Fishing

While sport fishing remains among the most popular outdoor sports, practiced by more than 50 million Americans, angler conservationists argue that their impact on the environment far outweighs their economic contribution to the resource. Marine recreational anglers spend in excess of \$20 billion annually pursuing their sport (Freedom to Fish, 2002). In 1996, recreational fishing had an economic impact of over \$108 billion on the US economy. The travel and tourism sector directly gains \$15 billion annually from recreational fishing. Recreational fishing supported over 1.2 million jobs in the US (RF&BF, 2002). Much of this economic impact occurs in rural and coastal communities where there are fewer employment options. These financial impacts drive economic prosperity, as well as help to provide major political lobbying power.

In addition, Recreational anglers and the industry have given back more than \$3 billion through license fees and excise taxes on fishing tackle to improve fisheries habitat and management (RB&FF, 2002). This large contribution to help fisheries only adds to the political pull of recreational fishing lobby groups. In comparison to the National

Rifle Association (NRA), recreational groups give back 6 times that of the NRA, a group that has proven political lobbying power.

Most state governments offer little or no financial support to their fish, and wildlife agencies. Instead, agencies rely on revenue provided by anglers, hunters, and boaters through the purchase of licenses, special federal excise taxes on equipment paid by manufacturers, and motorboat fuel taxes. A combination of fishing license sales and sport fish restoration funds, comprised of a special excise tax on fishing equipment and motorboat fuel taxes, support 83 percent of state fish and wildlife agencies' total fisheries/aquatic resource management budget (RF&BF, 2002). These economic factors behind recreational fishing put conservationists in an awkward position.

Conservationists would like to see more pressure from management on the recreational community to reduce fishing effort on certain species, but they do not want to lose the funding the recreational community gives back towards restoration.

The Freedom to Fish Bill

Why is this all a problem? The immediate problem is that the apparent failure of traditional management approaches to stall declines of economically important fish populations has led to spatially explicit management approaches, MPAs. Some recreational fishing organizations, like the recreational fishing alliance, feels the current management use of MPAs is to lock out the people, close down the oceans and 'throw away the key'. While these organizations are proponents of 'traditional' management measures such as catch and size limits they do not believe MPAs have any scientific consensus for broad, blanket closures (Freedom to Fish, 2002).

The Freedom to Fish bill is an active campaign resulting from the idea that recreational fisheries have little or no impact on fish populations. It asks that Congress only allow a ban on recreational fishing in an area when "there is a clear indication that recreational fishermen are the cause of a specific conservation problem" (Freedom to Fish, 2002). Conservationists (Recreational Fishing Alliance and Coastal Conservation Association members) worked with congressional leaders to draft the Freedom to Fish bill. It was reintroduced in the 107th Congress in the Senate (S.1316) by Breaux a democrat from Louisiana and Hutchison a republican from Texas and in the house (H.R. 3547) by Peterson a democrat from Minnesota (Freedom to Fish, 2002). Both bills have

bi-partisan support and include a specific set of criteria for the proper utilization of MPAs while protecting recreational anglers' freedom to fish. This attempt to exempt recreational fishermen from the inhibition of spatial closures based on NMFS 2% calculation is resulting in enormous political pressure that could result in a uniformed management decision. The bill as it stands does not have support from the NOAA offices but it has been supported by recreational fishing organizations which combined are a very powerful force (Kassinger, 2002).

Status of Fish Populations Today

Currently 45 percent of marine fish stocks whose status are known are "overfished" or approaching an overfished condition" (NMFS, 1999). The majority of these species are being taken from the sea faster than they can reproduce. Graphs of population size over time are frighteningly similar for many marine fish: exponential declines from historic levels to comparatively insignificant numbers. This is true for important recreational fish stocks as well. The 2002 stock assessment of important coastal recreation fish species in North Carolina shows that 56 percent of stocks are reported as "overfished" or "concerned" (NCDMF, 2003).

In addition to targeted catch, fishing also takes devastating levels of bycatch, unintentional catch of fish as well as sea turtles, marine mammals, and seabirds. This bycatch composes 25% of the world catch (FAO, World Resources 2000-2001). Commercial fishermen are not alone in the use of non-target gear types, recreational fishermen can use gear such as gill nets or trawls that collect unintentional catch.

So are the oceans just a free for all? Not in the US. The National Marine Fisheries Service is charged with managing and conserving our fishery resources. Through size limits, catch limits, gear requirements, and quota shares, NMFS regulates US fisheries. Despite all these regulations, we still have the overfishing problem described above. NMFS proposes to uses MPAs as an additional management tool to reduce overfishing.

MPA Designation

Several natural resource agencies are responsible for managing marine waters. Each agency has different responsibilities and management abilities, but all have the ability to establish MPAs. Under the federal government the United States Fish and

Wildlife Service, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, and the National Parks Service have the power to establish an MPA. On the State level MPAs can be established by the Department of Fish and Wildlife or the Department of Natural Resources. Within the state, counties and municipalities can serve a number of important roles in marine protection. Marine protection can be in the form of zoning, landuse planning and permitting, or volunteer "no take" reserves.

There are several acts of legislation that have an effect on MPAs. Each act assists in the establishment of MPAs through different parameters.

- National Park Service Organic Act (1916) sets up the National Park Service to manage the various parks and monuments to protect the natural and cultural resources of the U.S.
- The National Wildlife Refuge System Administration Act (1966) formally established the refuge system in the U.S. for the conservation, management, and/or restoration of wildlife resources, including fish. The Act encourages recreational fishing within refuges, provided that the effects of such activity are consistent with the conservation mission of the refuge.
- The National Marine Sanctuaries Act (1972) allows the Secretary of Commerce to designate an area as a National Marine Sanctuary on the basis of its conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities. The Secretary has the authority to prohibit any federal activities likely to damage the sanctuary resource. Executive Order 13158 was established in 2000 to strengthen and expand the national MPA system in order to increase protection of U.S. natural and cultural resources for current and future generations. The Executive Order laid out a National System of MPAs, under the joint jurisdiction of the Department of Commerce and the Department of the Interior, and provided guidelines for identification, monitoring, and evaluation of MPAs in U.S. waters.
- The Marine Life Protection Act (MLPA) of California (1999) was the first state legislation to address MPAs. The MLPA mandates the state to evaluate

and improve its system of MPAs. The final goal is to have a network of protected areas off the California coast, including some fully protected marine reserves. A “Master Plan Team” is responsible for determining location, size, and level of restriction of MPAs based on science, economics, and public input. The MPAs are to protect a wide variety of habitats, including intertidal zones, kelp forests, and sandy ocean bottoms.

MPAs can be established several ways. There is not one template for establishment because of the different types of MPAs and areas they designate, meaning federal or state waters. In general, MPAs can be established through top-down or bottom-up processes.

Generally, in a top-down process, a federal administration chooses a site to designate an MPA then publishes a notice of intent in the Federal Register. Management plans are drafted and released for public comment. A review is sent to legislative bodies where hearings on the issue can be held. Final regulations are published in the Federal Register. After a review period designation of the MPA takes place. The Florida Keys National Marine Sanctuary Tortugas reserve designation process proved to be the most successful to date where managers, scientists, and the public are pleased with the outcome. This is because they the process included public participation through a working group made up of commercial and recreational fishermen, divers, scientists, conservationists, citizens-at-large, and resource managers.

In a bottom-up process, grass-roots organizations or local community members identify an MPA. Participation at the beginning of a project enables local communities to acknowledge the benefits of a protected area, take credit for the designation, and enforce the regulations they establish. Such an approach also allows decision makers to more easily incorporate local ecological knowledge into the planning phases which can facilitate the protection and management of marine resources. For these reasons, a "bottom-up" approach that addresses the needs of the surrounding community can be viewed as a desirable model to adopt when establishing MPAs. Orca Pass Stewardship Area in Washington represents the culmination of an outstanding community-driven process which saw citizen groups and fisheries managers working collaboratively to achieve a common vision.

MPAs as a Management Tool

At the 2001 meeting of the American Association for the Advancement of the Sciences, 162 preeminent scientists signed a Scientific Consensus Statement on Marine Protected Areas. These scientists professed that marine reserves result in long-lasting increases in the abundance, diversity, and productivity of marine organisms. They claimed that marine reserves represent a more ecosystem based approach to resource management rather than looking at single components of the marine environment as in past management. These scientists are not the only ones supporting MPAs and finding them to be a more effective management tools (Roberts 1997, Pauly et al. 1998; Halpern 2002).

However, not everyone has jumped on the MPA bandwagon. While some of the benefits of MPAs are well documented in scientific literature studies such as an increase in marine life, some scientists question whether these benefits are universal. For example, Dr. Robert Shipp (2002) states that spillover effects of MPAs do not exist. He says that the benefit gained from fish immigrating from an MPA will be less than the benefit gained from a fishery managed by traditional measures, such as size and catch limits, or gear restrictions.

Benefits of MPAs

Marine protected areas can have positive impacts for individual marine species and entire ecosystems (Pauly et al. 1998). These benefits can be seen both within and outside reserve boundaries. Most notably, MPAs often lead to increases in the abundance, size, and diversity of marine species, due to less direct removal and decreased human encroachment on habitat (Halpern, 2002). These increases can also be seen outside MPAs, in a phenomenon called “the spillover effect” (Bohnsack 1998; Crowder *et al.* 2000). Spillover is where fish emigrate from protected areas to surrounding waters. Furthermore, the beneficial effects of larval dispersal from protected spawning areas can be seen vast distances from MPAs. As a result of this spillover and larval dispersal, fishermen, while prevented from fishing within reserve boundaries, can still benefit by increased catch around reserves. When no fishing occurs, they protect traditionally targeted species, as well as victims of bycatch and ghost fishing (taken by lost or abandoned fishing gear). Habitat damage by fishing gear is also stopped.

MPAs also play the critical role of establishing a rough scientific baseline for comparison to fished areas (Murray *et al.* 1999). While the areas are still altered by past fishing as well as present pollution, and human traffic, they provide a view of naturally functioning ecosystems as significant time has passed since fishing ceases. The absence of selective fishing techniques maintains the genetic quality of populations and normal sex ratios and provides a view of natural population structure (Murray *et al.* 1999).

MPAs also grant protection for historic and cultural resources in the marine environment. Thunder Bay in Michigan preserves cultural artifacts such as sunken ships and airplanes. Maintaining these resources decreases the risk that modern activities will damage or remove these important artifacts and ensure that history will be conserved for future generations.

Many social and economic benefits are derived from MPAs. These can include: enhancing non-consumptive use (tourism), maintaining fisheries, and providing opportunities for research and education. Dobrzynski and Nicholson (2001) found the establishment of the Florida Keys National Marine Sanctuary yielded economic benefits to many tourism operators who used the reserve to lure customers. Non-extractive uses of the marine environment like scuba-diving, surfing, and wildlife watching, all rely on a healthy environment. MPAs can help to ensure that marine resources thrive and draw recreational users that are important to coastal economies.

Drawbacks of MPAs

While MPAs yield many benefits, they may not be the answer to every management need. There are potential adverse socioeconomic and ecological effects.

MPAs can not adequately address all marine resource management issues. By limiting access or extractions, MPAs by themselves can not protect water quality. Water quality is still affected by pollution from point and non-points sources. A net work of land-based regulations plus an MPA would be needed to maintain water quality. Also, there is much debate about the utility of MPAs for highly migratory species (HMS) like tunas, sharks, and billfish (Bohnsack *et al.* 2000). Because these fish are not associated with one particular habitat, there is the “tragedy of the commons” view that if the fish is not taken inside the MPA, it will just be taken elsewhere along its migratory path. Some

scientists argue that by protecting the known spawning areas of these species provides essential benefits to the stocks need to thrive (Roberts, 2000).

If a reserve is placed with out consideration of physical and biological features like currents and spawning aggregations, enhanced effects of resource depletion can occur. Crowder *et al.* (2000) finds that MPAs placed in “sinks” (areas where mortality is higher than birth rates and immigration of species is higher than emigration) instead of a “source” (areas reverse that of a sink), can be unfavorable to consumptive resources. When MPAs do not decrease fishing effort within the “source” area larval fish will not be able to distribute out to the sink areas; therefore eliminating possible benefits to fish stocks from the MPA. Also, concentrations of fishermen can occur along the edge of the reserve expecting more and bigger fish, this is called the “edge effect”. The “edge effect” possibly increases concentration and fishing pressure in vulnerable areas and disrupt the potential benefits of the reserve.

MPAs can cause adverse socioeconomic impacts when they displace fishermen or other consumptive users. Dobrzynski and Nicholson (2001) found minimal negative economic impact on the consumptive users of the Florida Keys National Marine Sanctuary in Key West. Most of the cost incurred related to increased time on the water to go around reserve areas and time to find new fishing grounds. They also found increased crowding in the areas where they conducted business. Lastly, their results showed that consumptive users experience a negative psychological impact because of MPA placement.

MPAs should take into consideration people, economics, species, habitat, and ecosystem interactions, if they are to be important and innovative tools for managers. However, they are not the answer for every marine resource problem and must be designed and implemented with caution. Poor design and placement of MPAs could cause more harm than benefit. MPAs must use as suite of management tools, such as bag and size limits or pollution regulations to regulate marine resources for optimal ecological benefits and minimal losses both ecological and economical.

METHODS

Approach

I conducted a pilot survey using open-ended and direct survey interview guides. The goal was to develop a picture of the marine recreational fishermen's perceptions of marine protected areas. The interview sample includes marine recreational fishermen, charter boater, and headboat fishermen in the east coast regions of New York, New Jersey, North Carolina, and Florida. The data collection phase occurred over a four month time span from June to September of 2002. My development of the survey occurred in three phases: 1) focus group for developing the survey, 2) drafting and testing the survey, 3) developing an interview style.

Focus Group

I posed questions to fifteen marine recreational fishing areas users in New York to determine how to access fishers (time of day and general approach). I asked for recommendations on what language was most important when referring to marine protected areas and how to phrase questions to ensure cooperation and honesty in responses. These suggestions were used during the survey instrument development phase of my study.

Drafting and Pre-testing Survey Instruments

I drafted a survey instrument directed at recreational fishermen, incorporating the information gathered from the focus group. The survey instrument drew on six main topics.

1. Demographics. Aimed at gathering basic demographics for each user group such as age, area of residence, and occupation.
2. Fishing trends and type of fishermen (fishing such as fishing length, frequency, method of fishing, respondent's level of activity in fishing community such as belonging to a fishing club or choosing fishing vacations)
3. Position on MPA. (respondent's opinion of MPAs)
4. Knowledge and practical experience with MPAs. (respondent's opinions of the concept and practical application of MPAs)
5. Attitude of effectiveness. (respondents opinion of the benefits of MPAs)
6. MPA development (respondent's opinion on how MPAs should be selected and placed)

After drafting the survey instrument, I pre-tested it by conducting site-intercept interviews at local recreational fishing sites in Long Island. The survey pre-test helped me to evaluate the questionnaire length, comprehensiveness, clarity, and contentiousness of issues covered. I also used this time to ask respondents to comment on the optimal time of day and location to be interviewed. Survey revisions and finalization of methodologies followed the pre-testing of the survey. The final survey is included in appendix A.

Survey Instrument Coding

In order to ensure confidentiality of user group responses, each survey was accompanied by a code sheet, which assigned to it a unique code number corresponding to a confidential master list of all codes, affiliated respondents names and when possible contact information for data gathering uses. All respondents were informed of this confidentiality system prior to participation.

Sampling Methods

In surveying marine recreational fishermen, I employed site-intercept sampling and direct cold calls. Site-intercept involves sampling a population in a location that they routinely frequent and interviewing individuals as they arrive on site. It is important to note that this type of non-probability sampling is not statistically representative of the total population of recreational fishermen.

I interviewed 25 recreational fishermen from New York, New Jersey, and North Carolina using the site-intercept method of sampling. To find locations of recreational fishermen I used the sites from the Marine Recreation Fisheries Service Survey (MRFSS) for each state (NOAA Fisheries A, 1999). I choose ten sites from each state. Because I was limited by location and funds I only used sites from the northern half of New Jersey. Because I was limited by location I only interview respondents from the Beaufort/Moorhead City area of North Carolina. The sites were from the MRFSS survey in North Carolina.

I attempted to obtain a list of all licensed marine recreational fishermen in all east coast states. Due to confidentiality regulations or lack of a database, I only obtained a list of license holders from Florida, one of the four east coast states that required licenses. Carl Wethington of the Florida Fish and Wildlife Conservation Commission sent me a

random list of 5,000 out of 618,966 residential marine recreation Florida license holders of 2001. I interview 25 of these fishermen. A random number generator picked the names and contact information of fishermen I called. If a person was not home or wished not to participate, I called the next fishermen produced by the program. I found the optimal time to speak with respondents was between 6:30 and 8:30 P.M. on weekdays and from 3:00 to 6:00 P.M. on Sundays.

At each site I aimed to interview at least 3 fishermen but no more than 5. I would approach every 7th person fishing or on a boat. If someone declined an interview, I would approach the next person I saw fishing. In each state, I tried to sample 5 charter boat captains or head/party boat captains since their catch is counted in the total recreational fishing catch by MRFS (NOAA Fisheries B, 1999).

Interview Style

Due to the controversy surrounding MPAs within the recreational fishing community, I used an interview style designed to produce high response rates and provide an environment where respondents felt comfortable to speak freely (Janowich, 2001). The main elements of my interview style were:

1. I conducted interviews face to face, to create a comfortable and trusting setting.
2. I conducted interviews on the respondents turf to increase the level of relaxation among interviewees.
3. I introduced myself as an independent neutral researcher from Duke University. This was a very important part of the interview style; several respondents stated they would not have talked with me if I had been with another organization.
4. I was very tuned to listening to what the interviewee had to say about the issues.
5. I encouraged respondents to share any thoughts through open-ended questions.
6. I asked questions that would empower the respondents to critically think about the issue of MPA and give very thought out answers.
7. I offered to send the results to the respondents to help show that I appreciated their time and responses.

In summary, I used the knowledge gained by a focus group and a survey pre-test to design the survey. I created a pilot study that addresses major issues of MPAs among

recreational fishermen. My sampling methods do not allow for extrapolation of the results to the total population of marine recreational fishermen.

On-line Survey

In order to find out if west coast and gulf marine recreational fishermen had similar issues and concerns as east coast fishers, I placed my survey on the National Audubon's Living Ocean's web site. I placed a link to my survey in ten fishing chat rooms and on the Gulf States Marine Fisheries Commission with an explanation of why I was doing my project in hopes to create a neutral and comfortable environment. By placing the link in fishing chatrooms, I limited the response to only those fishermen who went into the chatrooms. It is important to note that this sampling method is only representative of the population sampled.

RESULTS

The results from my survey of recreational fishermen include data from in-person, phone, and web-based surveys. Please note that percentages have been rounded.

Table 1. Response rate for each survey method.

Survey Type	Number of Individuals Approached	Number of Respondents	Response Rate	Response Ratio
In-Person	88	75	85%	17 out 20
Phone	112	25	22%	4.4 out 20
Web-Based	Unknown	105	Unknown	< 4.4 out 20

Table 1 depicts the response rate received from each survey method. Out of the 88 marine fishermen approached, 75 were willing to participate in my study. The thirteen who declined, did so because they did not have enough time to finish the survey, yielding an 85 percent response rate. Out of the 112 individual licensed marine fishermen called over the phone, 87 refused to participate in the survey for different reasons varying from no time to no interest. It was not possible to determine the number hits on the web-based survey; therefore it is not possible to determine a response rate.

Demographics

I collected basic demographic data for each respondent surveyed for the purpose of characterizing my sample of marine recreational fishermen (table 2.a-2.d).

Table 2a. Age of respondent

<30 years	30-50 years	>50 years
17%	43%	40%

Table 2.b Respondent's occupation.

In Fishing Industry	Other
15%	84%

Table 2.c Respondent's place of residence.

FL	NC	NJ	NY	CA	MA	VA	Other
20%	13%	12%	18%	9%	5%	3%	20%

The majority of the respondents were over 30 years of age, while the split was almost equally for those 30 to 50 years and 50 years and older (43% and 40 % respectively). Of all fishermen interviewed, 15% worked in the fishing industry. There was a wide range of residence of the respondents (28 states) while most came from Florida, New York, New Jersey, North Carolina, California, and Massachusetts (20%, 18%, 13%, 12%, 9%, and 5% respectively) (table 2.c).

Fishing Trends and Type of Fishermen

In order to gauge an understanding of the respondent's involvement in fishing table 3.a-3.c), I asked them to comment on their frequency of fishing and their mode of fishing. Additionally I wanted to understand the importance (table 4.a-4.c) of fishing; I inquired about memberships to clubs, fishing vacations and type of fishing.

Table 3.a Time period respondent has been fishing.

< 1 year	1-5 years	6-10 years	11-20 years	>20 years
3%	10%	11%	20%	56%

Table 3.b How often respondent fishes.

Daily	Weekly	Monthly	Few Times a Year	No Answer
9%	45%	20%	12%	12%

Table 3.c Mode of fishing.

From Shore	From Own Boat	From Other's Private Boat	From Charter Boat	From Party or Head Boat
30%	43%	14%	6%	4%

The majority of the respondents had been fishing for more than twenty years (56%) (table 3.a). Fishing is a weekly activity for 45 percent of the respondents, while 20

percent fished monthly (table 3.b). Of those respondents that fished daily, 47 percent worked in the fishing industry. Fishing from one’s personal boat and from shore are the most common modes of fishing (43% and 30 % respectively) (table 3.c).

Table 4.Characteristics of respondents.

	Yes	No	Depends
Membership to fishing club	40%	58%	0%
Choose vacation destinations for their fishing value	66%	34%	0%
Practiced catch and release fishing	93%	5%	1%

The Majority of respondents were not members of fishing clubs or organizations (58%); while 40 percent were members (table 4). Of those in clubs, the most common were the National Association of Charter Boat Operators (25%), Trout Unlimited (9%), and the Recreational Fishing Alliance (7%). The majority of the respondents choose vacations based on their fishing values (66%) (table 4). Almost all of the respondents practiced catch and release fishing (93%) (table 4).

Position on MPAs

In order to gather the respondent’s position on MPAs I first read them a general definition of what an MPA: *Marine Protected Areas or MPAs are areas of the ocean that have been reserved by laws or regulations to provide lasting protection of part or all of the natural and cultural resources therein. MPAs can range widely in size, location, and level of protection.* I asked the respondent if they supported or did not support MPAs based on their knowledge of MPAs and the definition I had read them.

Table 5. Position on MPAs.

Support	Against	Depends
53%	14%	33%

The majority of fishermen are in support of MPAs, while 14 percent were against. The 33 percent of those that responded depends gave varying reasons from types of closure, who was excluded, to reason for closing an area.

Knowledge and Practical Experience with MPAs

To have an understanding of respondent's knowledge of MPAs, I asked them to state their own definition of MPAs. I also asked where their major source of information on MPAs came from. Additionally, I asked questions using a six-point Likert scale. A Likert scale measures the strength of agreement towards a set of clear statements to gauge respondent attitudes or reactions to a topic. Respondents chose from a five point scale ranging from strongly agree to neutral to strongly disagree. I also gave them the option of responding, "don't know" to either question. These questions included if MPAs close the best fishing locations, if recreational fishermen have a say in where MPAs are to be placed, and how much impact commercial and recreational fishermen have on fish populations.

Table 6.a Fishermen's previous knowledge of an MPA.

Yes	No	No Answer
81%	14%	5%

Table 6.b Recreational fishermen’s experience with MPAs.

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don’t Know	Depends
MPAs close the best fishing sites.	11%	19%	22%	21%	10%	15%	2%
Fishermen have a say in where MPAs should be located	9%	12%	10%	22%	33%	12%	1%
Recreational fishing has little impact on fish populations.	17%	21%	15%	27%	18%	1%	1%
Commercial fishing has little impact on fish populations.	1%	0%	0.5%	8%	88%	0.5%	1%

The majority of the respondents have previous knowledge of MPAs (81%) (table 6.a). Respondents did not lean toward agreement or disagreement with respect to MPAs closing the best fishing sites (table 6.b). Since the results were varied, I tested if there was a significant difference between supporters and opposers of MPAs. There was no significant difference using a chi squared comparison test ($\chi^2 = 35.657$, $df = 4$, $p\text{-value} = 0$). The respondents tended to disagree with the statement that recreational fishermen have a say in where MPAs should be located, 33 percent strongly disagreed and 27 percent disagreed (table 6.c). The results varied to the statement recreational fishing has little impact on fish populations (table 6.d). A chi squared test was preformed to see if there is a significant difference between supporters and opposers of MPAs. A significant difference was found between supporters and opposers belief of recreational fishermen’s impact on fish populations ($\chi^2 = 10.0125$, $df = 4$, $p\text{-value} = 0.0402$). The majority of MPA supporters (56%) believe recreational fishermen have an impact on fish populations,

while the bulk of the opposers (53%) perceive recreational fishermen to not have an impact on fish populations. The majority of the respondents (88%) strongly disagreed with the statement that commercial fishermen have little impact on fish populations.

Attitude About MPA Effectiveness

To investigate the perceived effectiveness of MPAs, I asked recreational users if they believed MPAs would lead to bigger, more and more types of fish. I also inquired if MPAs would be effective in protecting highly migratory species.

Table 7.a MPAs are effective in protecting highly migratory species.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Depends
20%	24%	10%	12%	26%	15%	2%

A table7.b Recreational fisherman's perceived effectiveness for fish species.

MPAs will lead to:	Yes	No	Depends	Don't Know	No Answer
Bigger Fish	57%	25%	3%	<1%	14%
More Fish	76%	6%	2%	<1%	14%
More Types of Fish	47%	31%	5%	1%	14%

Responses leaned slightly to agreeing with the statement that MPAs are effective in protecting highly migratory species, 44 percent agreed verses 38 percent disagreed. The majority of respondents perceived MPAs will lead to more fish and bigger fish (57% and 76% respectively) (table 7.b). However, responses were evenly spread among positions to the statement MPAs will lead to more types of fish (table 7.b). A chi squared test showed that there is significant difference between proponents and opponents of MPAs position on the statement: MPAs will lead to more types of fish ($\chi^2=9.0539$, $df = 1$, $p\text{-value} = 0.0026$). The majority of MPA proponents (70%) believe MPAs will lead to more types of fish, while the bulk of the opponents (73%) perceive MPAs could not lead to more types of fish.

MPA Development

To find out what types of areas MPAs should include, I asked respondents to report on types of closures and types of habitats that could be considered effective MPA placements.

Table 8.a Areas to be considered MPAs.

Area Type	Agree	Disagree	Depends	Don't Know
Areas closed for parts of the year should be considered an MPA.	56%	38%	1%	5%
Areas closed to one gear type should be considered an MPA.	58%	36%	0%	5%
Areas closed to commercial fishermen should be considered an MPA.	67%	26%	1%	5%
Areas that only allow catch and release fishing should be considered an MPA.	58%	37%	4%	0%
Areas that are closed to all fishing should be considered an MPA.	55%	45%	3%	4%
Areas that are closed to all activities should be considered an MPA.	48%	45%	2%	5%

Table 8.b Some MPAs should be permanent closures.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Depends
19%	25%	5%	15%	27%	6%	1%

The greater part of the respondents believed MPAs should include areas that are closed to fishing for part of the year (56%) (table 8.a). Areas closed to a single fishing gear type were thought to be an MPA by 58 percent of the respondents. Areas closed to

commercial fishermen were perceived to be MPAs by 67 percent of the interviewees. The majority of the respondents thought that MPAs should be areas that allow catch and release fishing (58%). Areas that are closed to all fishing were considered MPAs by 55 percent of the respondents. Lastly, Respondents had about equal support and opposition for the statement that Areas closed to all activities should be considered MPAs (48% and 45% respectively) (table 8.a). The response to some MPAs should be permanent closures had equal opposition and support (table 8.b); therefore chi squared test was perform to determine if there was a significant difference of position between proponents and opponents of MPAs. A significant difference was found with respect to the respondents position on MPAs and their position on MPA permanent closures ($\chi^2 = 52.6668$, $df = 4$, $p\text{-value} = 0.000001$). The majority of the supporters of MPAs agreed that some MPAs should be permanently closed (68%), while the majority of the opposers did not want MPAs to close permanently (84%).

Table 9. Potential areas to establish MPAs

Potential Areas for MPA Establishment	Yes	No	Depends	Don't Know
Spawning Areas	76%	19%	2%	3%
Feeding Areas	31%	63%	2%	2%
Coral Reefs	58%	36%	2%	2%
Areas of High Species Diversity	40%	52%	3%	2%
Nursery Areas	69%	25%	2%	2%
Migration Corridors	39%	51%	2%	3%

The majority of respondents thought spawning sites, nurseries, and coral reefs are good places for establishing MPAs (76%, 69%, and 58% respectively) (table 9). The bulk of the respondents thought feeding sites, places of high fish species diversity, and

migration corridors were not good places for establishing MPAs (63%, 52%, and 51% respectively) (table 9).

Table 10.a Most important criteria for establishing an MPA location.

Conservation	Enforcement	Fishermen's Concerns	Other	No Answer
60%	12%	10%	11%	7%

Table 10.b Principal problem in establishing an MPA location.

Lack of Science	Lack of fishermen Input	Unclear Rules	Other	No Answer
25%	32%	22%	16%	5%

The majority of the respondents found conservation to be the most important criteria for establishing MPAs (60%) (table 10.a). The categories of enforcement, fishermen's concerns and other were evenly distributed (12%, 10%, and 11% respectively). The frequency of responses was fairly equal in the principal problems in creating MPA locations (table 10.b). A chi-squared test showed no significant difference among supporters and opposers of MPAs position on the principal problems of MPA establishment ($\chi^2 = 2.7858$, $df = 3$, $p\text{-value} = 0.4258$).

Further Education

Table 11. Interviewees desire for more information

	Yes	No
Respondents wanting survey results	57%	43%
Respondents Participating in further studies	58%	42%

Over half of the interviewees wanted to learn more information on MPAs by receiving the results of this study and by participating in further studies (table 11). Just more than half of the MPA supporters (52%) and 39 percent of MPA opposers wanted to receive the results of this survey. Exactly half of the supporters and non-supporters of MPA wanted to participate in further studies.

DISCUSSION

Due to various characteristics of my data, such as small sample size and the nonrandom strategy with which some of my data were collected, the inferences that I draw upon only regard the sample population of recreational fishermen, and make no assumptions about the population of recreational fishermen at large.

The in-person site-intercept interview method proved most effective. Respondents felt comfortable that my objectives were not affiliated with any resource management structure and their responses would be kept in confidence. The face-to-face interview provided a good comfort level that helped the respondents open up – seen in their long comments to the open-ended questions. The web-based survey provided the least comfort for the interviewee. Respondents questioned my affiliation with the Living Oceans Program and my use of the data gathered from the survey (Appendix B). I received several surveys from the web with false responses (i.e. multiple choice questions were left blank and open-ended questions were derogatory and fantastical).

Characteristics of Fishermen

Generally, the fishermen I interviewed were thirty years of age and older and lived on the East coast. More than half of the respondents fish at least once a week. Of those frequent fishermen, almost three quarters fished from their boat or a friend's private boat. Most viewed fishing as an important factor in their lives and choose vacation destinations because of the fishing value. The fishermen also portrayed a conservation ethic, three quarters of those practicing catch and release fishing did so to enhance conservation.

Position on MPAs

Due to the opposition to and questioning of MPAs I found from recreational fishing organizations when conducting research on the web prior to this study, I expected to find the majority of the interviewees to be opponents of or at least cautious to MPAs. The results partially contradicted this theory with half of the respondents firmly supporting MPAs as presented with a quarter of those respondents as fishing club members. Not surprisingly, a third of the respondents were unsure of their position on MPAs. Much of their decision depended on what type of closure the MPA established

and if sound science backed the MPA. From continued conversations on this issue, few respondents stated that if a reserve prevented them from fishing they would not support it.

Knowledge and Practical Experience with MPA

My expected findings of the majority of interviewees to have some prior knowledge of a marine protected areas proved true. Also not surprising, due to the recent media hype of the freedom to fish bill, fishermen's largest source of information on MPAs came from the media, including print, radio, and television as well as fishing clubs and associations. Interestingly, a quarter of those fishermen belonging to fishing clubs had no previous knowledge of MPAs.

Managers aim to include input from all users groups when establishing MPAs by collecting public comments and including stakeholders planning meetings. More than half of the respondents feel their input is being ignored. A third of the respondents felt MPAs closed the best fishing sites. These results imply that fishermen either feel their comments are ignored or that they are not involved in the management process.

Respondents almost unanimously agree (96%) that commercial fishermen have an impact on fish populations, while the opinions of their own impact on fish populations is split down the middle. There was a difference between the opinions of proponents and opponents of MPAs knowledge of recreational angler's impact on fish populations. MPA supporters evenly spread their decisions across the board, while surprisingly most of those against MPAs strongly feel that recreational fishermen have an impact on fish populations. While some of the population interviewed was well informed, the split results indicate a need for more education and scientific information on how recreational fishermen impact fish populations.

Attitude of MPA Effectiveness

Scientists have many measures for MPA effectiveness. Most commonly the literature boasts that marine protected areas produce more fish, bigger fish, and more types of fish (Halpern, 2002). I choose these three factors to determine the respondent's perceived effectiveness. Over three quarters of the fishermen agreed that MPAs could lead to bigger fish (76%), as well as just over half agreed MPAs could lead to more fish. Interestingly about a quarter of those who supported MPAs did not think bigger fish came

out of MPAs and half of those not in favor of MPAs found bigger fish a reality. About 60 percent of those against MPAs perceived more fish came out of MPA establishment. Positions varied on MPAs leading to more types of fish. Respondents expressed to me that they did not understand how closing an area would create new ecological circumstances to encourage new species. Almost one third of those in favor of MPAs did not believe MPAs will bring more types of fish. Over all the general consensus of respondents found an MPA to be effective in bringing more and bigger fish but had some hesitations that MPAs would lead to more types of fish. These results reveal that recreational fishermen are well informed of the most common scientific benefits of marine protected areas but could use further education on how more types of fish can be a benefit of an MPA. It is not surprising that respondent's support of more types of fish varied due to the increased complexity of the science behind this concept.

The notion that MPAs are effective in conserving highly migratory species is one of the more controversial benefits of MPAs. Positions on this issue varied, but almost half thought them to be effective. Respondents expressed they had heard conflicting science backing this issue and expressed interest in further information. Several interviewees found it hard to understand how a species that does not stay in one spot could benefit from an MPA. Protecting highly migratory species is a touchy subject for many recreational fishermen since highly migratory species are the target of many fishing tournaments and charter boat operations. The results indicate that recreational fishermen think that an MPA could help highly migratory species but they do not know how it would work.

MPA Development

Several of the fishermen I interviewed in the focus group stated that the position on MPAs depended on the placement and reason for establishment. I asked a series of questions to find out areas fishermen found appropriate for MPAs. The majority of the interviewees agreed that spawning sites, coral reefs, and nurseries best fit the ideal habitat for MPAs (76%, 58%, and 69% respectively). The respondents agreed that MPAs should cover several types of closures and restrictions, including seasonal and gear closures as well as user group exclusions (both commercial and recreational). There was not an overwhelming agreement of the types of closures MPAs should employ (table 6.b). This

shows that there is a need for better communication on the types of MPA closures and the benefits and drawbacks of each.

The majority found conservation as the most important criteria in setting up an MPA. However respondents did express that they did not always believe conservation to be the reason for establishing a reserve or that the science clearly indicated a best spot for the reserve. This indicates some fishermen are aware of a disconnect between managers and scientists in the designation process. Not having a voice with the people who designate the science behind the MPA is a clear concern for many fishermen. They expressed that the scientific evidence behind the MPA does not include essential bits of information on the area. These fishermen feel that their long history of fishing in the same waters has given them extensive knowledge of the ecological dynamics of their fishing grounds. They would like to contribute this data to the development of MPAs with scientists and managers. These results indicate that recreational fishermen have misconceptions of the establishment process of MPAs. While science publishes documents about biological and ecological dynamics of the area, the managers ultimately choose what information to use to develop MPAs. More education on the processes of MPA establishment is clearly needed.

I gave fishermen several opportunities to express in their own words how MPAs could be made better and what their biggest concern or fear was about MPAs. Continually, they expressed the need for government to include the recreational fishermen's voice in potential management decisions and to make sure the science backing the MPA undoubtedly showed potential benefits for the area.

MANAGEMENT RECOMMENDATIONS

In this section I provide recommendations to marine resource managers carrying out MPA initiatives and recreational fishing policies. My recommendations address changes in the management system to better include the recreational fishermen's voice with managers. They also address recreational fishermen's misunderstanding of marine protected areas purpose and designation by managers and policy makers, based on the insight gathered from my survey.

1) Marine recreational fishing licenses should be mandatory in all coastal states. A license enables managers to establish the number of marine recreational fishermen. Only 12 out of the 23 coastal states currently have a license and only 9 keep a query friendly database of those license holders. By establishing query friendly databases, managers can produce relevant statistics on topics such as fishing effort and fishermen demographics. A recreational license for saltwater anglers enhances the quality of data collected for the recreational harvest of coastal resources. Resident and nonresident recreational fishermen harvesting fish should contribute to the conservation and enhancement fish resources through license revenues. Revenue generated by the sale of a recreational license should be used to improve fishing opportunities. Funds could also be used to improve enforcement and increase education about the process of conserving fisheries resources.

2) While the majority of respondents of this pilot study claim to have previous knowledge of MPAs, most do not have a full understanding of MPAs or their purpose. Managers should attempt to create more educational media to reach a greater number of fishermen. Having a license would make this process more attainable. Pamphlets showing the location and explaining the purpose and process of establishing each MPA within state waters should be handed out with the sale of a license. Making the pamphlets available at places fishermen frequent such as tackle and bait shops, increases the chances of reaching more fishermen. Large maps with brief explanations of MPAs displayed at public boat access sites, piers, and marinas additionally educates more users, as well as displaying information on each coastal state's division of marine fisheries web-sites.

3) To enhance the recreational fishing database, managers could implement a survey when fishermen purchase a license. By completing a short survey managers could offer a discount to the license as some states offer discounts on driver's licenses of organ donors. As many states move to electronic licensing, this process would be very simple and cost effective method of collecting data.

4) The process of marine reserve establishment should involve local recreational fishermen's input at each stage of the planning process to ensure cooperation and compliance of new regulations. These representatives should then have an effective media in which to communicate to the largest number local recreational fishermen. The information on the process management used to set up the MPA and why the regulations came about should be included in this communication.

5) Establishing an ambassador program with representatives of fishing organizations could help to reduce the conflicts between managers and stakeholders. An ambassador program would include representatives from stakeholder groups (such as a fishing club), policy makers, and scientists. Meetings and workshops designed to bring the groups together to help educate each other on issues surrounding proposed and established MPAs would be discussed. Managers could give details on placement and rationale for MPAs in the area with scientists to go into ecological data. Stakeholders could explore concerns surrounding MPAs and relay their knowledge of local areas to scientists. The group as a whole could explore the best process to establish an MPA to include the interest of all stakeholders. The ambassador program could achieve the goal of establishing a trust between managers, stakeholders, and scientists.

CONCLUSION

This pilot study represents an important start to understanding how recreational fishermen view marine protected areas. Efficient and effective MPA designation and implementation relies on buy-in from a diverse array of stakeholders, including recreational fishermen, local residents, marine outdoor enthusiasts, local business, and more. The outcry against managements use of MPAs by organizations such as the Coastal Conservation Association or the Recreational Fishing Alliance through the Freedom to Fish Bill has lead the public to perceive recreational fishermen do not want managers to use MPAs as a fisheries management tool. Contrary to this belief, 53 percent of the sample population in my study supported the use of MPAs of those a quarter were in fishing clubs

While it is positive to find most fishermen found MPAs to have effective benefits such as bigger and more fish, the recreational fishermen generally lacked a basic knowledge of the concept and establishment of marine protected areas and the services they can provide. These facts suggest that managers should better target the educational campaigns on MPAs to recreational fishermen. In addition, although most of the charter boat and head boat captains in this study know about MPAs, about a quarter adamantly disagree with them and their benefits, almost half have some reservations with MPAs and a third support them. Therefore, unless managers make and effort to reach out to this user group, conflict with managers and user groups will continue to flourish.

The respondents agreed that MPAs should cover several types of closures and restrictions, including seasonal and gear closures as well as user group exclusions (both commercial and recreational). Overall the interviews opinions on types of closures comply with the type's manager already put to use, but the respondents have little knowledge of these different types of restrictions that can occur with in an MPA, such as an MPA that closes an area to all fishermen during spawning season of Red Drum. They also showed virtually no knowledge of the MPA establishment process, which is not surprising since there many different methods to set up an MPA. While it is positive that most fishermen found conservation to be the most import basis for the establishment for MPAs, there was a common theme among interviewees that recreational fishermen

should have some input into the science of an area, such as spawning times and places. The respondents do not feel that their voice is being heard in respect to their knowledge of fishing areas and would like managers to incorporate their voice.

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APPENDIX A

SURVEY INSTRUMENT

Code: _____

Date: _____

Time: _____

Location: _____

Name: _____

Phone

In-person

Code: _____

Hello my name is _____

I am conducting a survey for a Masters project in conjunction with Duke University to identify recreational fishermen's perceptions of Marine Protected Areas or MPAs to improve the MPA designation and implementation process to specifically address recreational stakeholder concerns. Would you mind spending about 15 minutes to complete this survey?

IF YES... CONTINUE WITH THE FOLLOWING

IF NO....Thank you for your time, goodbye.

The information you give will be used for my master's project at Duke University. The results will be presented to National Audubon's Living Oceans Program to help improve their approach to the MPA designation and implementation process to specifically address recreational fishermen's concerns. There are no correct or incorrect responses, so please feel free to express your opinions. Please answer as many questions as you can. I can guarantee that the answers you give me will be confidential- in no way will the information you provide me be connected with your name.

Please give only one answer unless otherwise noted.

If you have any questions about your rights as a research participant at Duke University, please contact the chair of the Human Subjects Committee at (919) 684-3030.

1. Are you a marine recreational fisherman?
 - a. Yes
 - b. No (if no then thank them for their time and stop the survey)

2. Are you?
 - a. Under 30
 - b. 30-50
 - c. Over 50

3. How long have you been marine recreational fishing?
 - a. <1 year
 - b. 1-5 years
 - c. 6-10 years
 - d. 11-20
 - e. >20 years

4. What state do you currently reside in? _____

5. Do you work in the fishing industry?
 - a. Yes, if so, recreational or commercial and what aspect _____
 - b. No

6. In the past few years, how often do you marine recreationally fish?
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. A few times a year

7. Are you a member of a recreational fishing organization/club?
 - a. Yes , if so, what organization _____
And what city and state is it located in? _____
 - b. No

8. What top three types of marine species/fish do you primarily target?

9. What is your most common mode of fishing?
 - a. From shore (includes beach, jetty, etc.)
 - b. From your own boat
 - c. From other's private boat
 - d. From charter boat
 - e. From partyboat/headboat

10. Have you ever chosen a vacation destination primarily for its fishing value?
 - a. Yes
 - b. No

11. Do you practice catch and release fishing?
 - a. Yes
 - b. No if no skip to question 13
12. Which of the following reasons leads you to release your catch? (you may check multiple answers)
 - a. Due to fishing regulations
 - b. Do not want the fish
 - c. Conservation ethic
 - d. Other (please specify) _____

13. Have you ever heard of the term marine protected area (MPA) or marine reserve?

- a. Yes
 - b. No If no, skip to Now Read just before question 15.
14. From your perspective, what is an MPA?

15. Where have you heard about Marine Protected Areas? (you may check multiple answers)

- a. Fishing organization/club
- b. Media (print, radio, television)
- c. Internet
- d. Scientists (personal communication or scientific journal)
- e. Friends/relatives
- f. Other (please specify)_____

Now read: Marine Protected Areas are areas of the ocean that has been reserved by laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein. Marine Protected Areas range widely in size, location, purpose, and level of protection.

16. Do you support MPAs?

- a. Yes
- b. No

17. From your perspective, which of the following should be considered a marine protected area? (you may check multiple answers) (read one at a time and have them say yes or no)

- a. Area closed to fishing for part of the year Yes No
- b. Areas closed to a single commercial gear type, such as longlines or gill nets
Yes No
- c. Areas closed to all commercial fishing Yes No
- d. Areas allowing catch and release fishing only Yes No
- e. Areas closed to all fishing, recreational and commercial Yes No
- f. Areas closed to all entry, i.e., no fishing, diving, swimming, etc. Yes No

18. For the next question I would like you to tell me how strongly you agree or disagree with the statement I read. Your answer should range from 1 to 5, with strongly agreeing being 1 and strongly disagreeing being 5. If you don't know how to respond, please let me know.

	Strongly Agree	Neutral	Strongly Disagree	Don't Know		
a.MPAs are useful for protecting highly migratory species.	1	2	3	4	5	6

b.MPAs close the best fishing sites.	1	2	3	4	5	6
c.Recreational fishermen have a say in where MPAs are to be located.	1	2	3	4	5	6
d.Recreational fishing has little impact on fish populations	1	2	3	4	5	6
e.Commercial fishing has little impact on fish populations	1	2	3	4	5	6
f.Some MPAs should be permanently closed to all recreational and commercial fishermen.	1	2	3	4	5	6

19. What do you see as the greatest benefit from MPAs?

20. What is your greatest concern about MPAs?

21. Do you believe MPAs will lead to:
- | | | | |
|----|--------------------|-----|----|
| a. | Bigger fish | Yes | No |
| b. | More fish | Yes | No |
| c. | More types of fish | Yes | No |

22. Which of the following do you think are good target sites for MPAs? (you may have more than one answer) (read one at time have them say yes or no)

- Spawning sites
- Feeding sites
- Coral reefs
- Areas of high species diversity (place where you find many different types of fish)
- Nursery grounds (place where juvenile fish live while growing bigger and stronger)
- Migration corridors (an area where it is know that a fish species travels example.. to go from a feeding area to a spawning area)
- Other please specify_____

23. Which would you say is the most important criteria for choosing the location of an MPA?

- a. Conservation needs
- b. Enforceability
- c. Fishermen's concerns
- d. other please specify _____

24. Which of the following causes the most problems when selecting a MPA site:

- a. Lack of fishermen input
- b. Lack of science backing reserve location
- c. Unclear rule and regulations of the MPA
- d. Other (please specify) _____

25. What is the single most important thing the government can do to properly address the needs of recreational fisherman concerning MPAs?

26. Would you be willing to participate in a follow-up questionnaire? If so please provide us with your contact information below:

You have now completed the survey. Thank you for your time. If you would like to receive the results of the survey, which should be available in Spring 2003, please give me your mailing and/or e-mail address. results will not be available until spring, 2003.

? Yes, please send the results of the survey to:

APPENIX B

DIALOG WITH RECREATIONAL ANGLERS IN A FISHING CHATROOM

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----- transcript follows -----

This is topic Rec Marine Fishing survey--from www.ifish.net, Fishing The Coast, Oregon and Washington.

Posted by MastersStudent (Member # 3047) on 08-26-2002, 03:56 PM:

Hi I am a master's student at Duke University. I am doing my thesis on marine recreational angler's perceptions and concerns for marine protected areas. I have a survey that will take about 15 minutes on-line. I am having trouble reaching out to west coast fishermen so please fill out my survey. I want to get all types of angler's opinions.

http://www.audubon.org/forms/updated/lo_survey.html

Thank you for your time!

Kind regards,

Toni

Posted by black magic) on 08-26-2002, 04:07 PM:

Notice to IFISH people,

Be careful of this one. This is the Audubon Society and they have already taken a position that they would like to close portions of the oceans to all fishing for the foreseeable future. Their rhetoric does not match their position. This data could be used against you. I have no doubt that any information that you give can be "restructured" to fit the real agenda. They claim that they are only trying to help fisherman. Perhaps in the same way Bill Clinton was only trying to help Monica.

Posted by skein on 08-26-2002, 04:22 PM:

ABSOLUTELY watch this one! Go to their main site, www.audubon.org, and check out the link to Audubon's Living Ocean Campaign, then look down far enough to find the link to "Conservationists call for strong standards to protect Pacific fish populations."

These people are not on our side and will use Bad Science (BS) to further their goals.

We (us and them) lose when emotional rhetoric is substituted for management and science. How many spotted owls do you suppose died in the Biscuit Fire? Who do you suppose got our forests in that predicament (hint, hint - knee-jerk environmental groups).

Who do you suppose supported those groups, especially the owl-huggers? Yep - the bird loving Audubon Society. And now they're after our fish!

Jennie, I don't want to start a war, and sincerely hope I don't get kicked off the board for the above tirade, but these people need to prove to me I'm wrong in what I say.

Damn!

Skein

Posted by GutshotApe on 08-26-2002, 04:32 PM:

Black Magic is right, you can't trust the Auduboners . They call themselves "conservationists" (which means being in favor of wise use) but really they are "preservationists" (they want no use - by us at least). Beware!

GutshotApe

Posted by Mojo on 08-26-2002, 06:35 PM:

I am a conservationist, and I see a place for some areas that are set aside (preservationist). I read that survey, and immediately thought, "hmmmm...leave out a few questions (and their answers)and you could make anyone believe all us ifishers want to shut down the oceans to recreational fishing. I suggest that no one answers the request for this survey.

Posted by MADWIZERD on 08-26-2002, 11:03 PM:

i had a chick from the Audubon Society come to my door a couple months ago asking for money..i told her i dont like the group and go away.she saw my duck unlimited t-shirt and had the gaul to say"we are just like them".i told her to get off my porch.what these people will say to get what they want..

Posted by 08-27-2002, 06:50 AM:

Toni has posted this on at least one other board and has defended that her only affiliation is to Duke university. I have no reason to doubt her on that but it is still on Audubons website and I am sure they could have access to the data. Go ahead and answer the survey if you want, but I would be carefull with your responce.

Here is some text from our "enviornmental extremists alert" website:

A Tool Or The Cure?

The term sounds innocuous enough - marine protected area. The simple fact is there are a significant number of marine protected areas already in existence that have been established by federal fishery management councils. However most current MPA's are "limited use" or "seasonal" designations aimed at protecting specific places or species of fish from damaging activities and are not blanket closures that prohibit all use. Some areas are protected through the exclusion of specific types of commercial fishing gear to halt damage to habitat or reduce the pressure on overfished species. Others are simply short, seasonal closures to protect spawning aggregations of certain species of fish that are particularly vulnerable when congregated. In the form of seasonal closures and gear-restricted areas, MPA's can be a useful tool. This is especially true when they are incorporated into a comprehensive fishery management plan that includes other management tools like harvest quotas or limited entry provisions on commercial participation.

The RFA has been supportive of such efforts if they are 1) supported by peer-review scientific data; 2) tightly structured to address specific issues; 3) and do not unduly regulate recreational fishing when recreational fishing activity is not the problem. Recreational fishing is already managed and, for some species is highly restricted, through the use of seasons, size and bag limits. Recreational fishing, with few exceptions, is habitat friendly and economically beneficial regionally and nationally while placing the

least amount of pressure on fish stocks. It is considered a personal liberty and a wholesome outdoor activity by millions of Americans. In almost all cases it has been excesses in the commercial harvest of marine resources and the use of damaging commercial fishing gear that have been responsible for stock depletions and habitat loss or destruction. Painting recreational fishermen with the same broad brush is simply wrong, but it is happening more frequently, especially in the MPA debate.

The agenda being pushed by a growing coalition of environmental groups goes much further than using MPA's as a tool. The claims being made are that a network of large "No-take" zones closed to all fishing activities that encompass thousands of square miles each and are interconnected up and down the coasts are the remedy for all that ails the oceans and fisheries. It is a scheme that many highly regarded marine scientists and forward thinking fishery managers do not subscribe to and the long-term economic effects of such a system would be devastating while simply circumventing the application of sound fishery management principles.

Junk Science?

The manner in which the debate on "No-Take" zones is being conducted would be interesting if it wasn't so scary. The major promoters of the concept and driving force behind the agenda are the Pew Charitable Trust and the Packard Foundation, which fund a loosely knit group of environmental groups. The list, at any given moment, can include Environmental Defense (formerly Environmental Defense Fund); the Natural Resources Defense Council (NRDC), The Ocean Conservancy (formerly the Center for Marine Conservation); Conservation International; National Audubon Society; American Oceans Campaign; Earth Justice and others. Most of these organizations receive the majority, if not all, of their funding from the two foundations. The foundations frame the agenda through the funding of marine scientists throughout North America. A large number of academics in the field hold Pew Fellowships, which come with significant grants for their work on issues of interest to the foundation. Pew then picks scientists to conduct studies aimed at developing justification for their specific agenda and provides funding. That has been coming to light recently when investigation into the manner in which a good deal of the scientific support has been generated in the MPA debate. When Pew has the study results they want, they are then presented to the media and peddled to politicians as unbiased evidence. Unfortunately, such studies end up presenting a one-sided argument.

It's All Politics

The problems we deal with today have been caused by decades of poorly conceived and written legislation that refused to deal with the reality of commercial overfishing. These laws did not allow and even prevented the agencies charged with managing marine resources from making the hard decisions and putting them into action. The weak legislation of the past has environmentalists looking for a panacea to fix the ocean and they believe they have found that panacea in "no-take" zones. Now they have to sell it to the politicians so it can be written into law.

The groups pushing the "no-take" zone agenda is not only well funded, it is politically astute. Their efforts include a variety of battlefields all aimed at putting pressure on the political process that is currently grappling with years of failure in the management of marine resources. The environmentalists are active in the media creating ties to their causes in a variety of ways. Pew has spent close to \$100 million in donations to media centers, public broadcasting and at schools of journalism and telecommunications in the

past ten years. It has created a more "friendly" media to promote their positions. The environmental groups have media centers, advertising agencies and public relations coordinators that pump out press releases promoting questionable studies to gain public support for their positions. They conduct and publish simplistic polls that infer broad public support for their positions that gets published in willing media outlets all over the United States with the goal of putting increased public pressure on politicians and the political process. This is all very well orchestrated and highly effective when it goes unchallenged.

Support the Freedom To Fish Act, www.freedomtofish.com

Posted by MastersStudent (Member # 3047) on 08-27-2002, 11:57 AM:

Hi...I would like you all to know that my survey is on the Audubon web site because they agreed to pay to have it interactive on the web. I did not have the funding to do this (I am a master's student at Duke University as I said before). I am the one that will be analyzing and collecting the data. If you are going to fill out my survey, which I hope you will, please give me your honest opinions. I am trying to find out what recreational fishermen know about MPAs and what their biggest concerns are in-order to come up with ways to have constructive collaboration between recreational anglers and policy makers. If you have any questions please feel free to email me at tmk3@duke.edu.
Thank you for your time,

Toni

Posted by black magic on 08-27-2002, 12:13 PM:

Toni,

I am not convinced. I know that the Audubon Society is campaigning against the Freedom To Fish Act so I know what their agenda is, and I must assume yours is the same or they would be unlikely to support you in this instance.

I would suggest that you contact the Recreational Fishing Alliance and see if they will contribute to your project as well. If they do I may be willing to listen.

Posted by Pilar's Mate on 08-27-2002, 01:42 PM:

I'm probably going to get slaughtered for this, but how about a different view... We struggle with giving sportfishers a voice, then we bash someone who not only recognizes us, but wants to gather our opinions. What is the harm in that. I read through the questions and answered what I was comfortable with. There were some questions for which I felt there was no good answer. I declined to answer those. Others had multi-choice answers along with OTHER and a place to add an explanation. I didn't like any of the blanket answers and selected Other and stated something to the effect of "a blanket answer would be inappropriate".

I encourage you to read through the survey, answer what you feel comfortable with, make comments. Be heard. What's the harm in that? If you answer that you don't support MPA's or that MPA's may be appropriate in some areas, but not others or that MPAs can be avoided by managing our resources, what's the harm in that?

My \$.02

Posted by black magic on 08-27-2002, 01:56 PM:

Jen,

There is no proof that Toni is a student anywhere or that there is a Toni at all. I do know that Audubon Society actively campaigns against recreational fishing agendas. I also know that it is common practice to "cherry pick" legitimate data to possibly present that sport fishers are in favor of marine protected areas when in fact it was because of clever survey management.

Posted by Pilar's Mate on 08-27-2002, 01:59 PM:

The goal of the survey is clearly stated and if you are concerned about whether Toni is a student of Duke or this is a legit survey, there is phone number to verify...

"If you have any questions about your rights as a research participant at Duke University, please contact the chair of the Human Subjects Committee at (919) 684-3030."

Posted by ampersat on 08-27-2002, 02:09 PM:

as a sociology major, i was taught about statistics and questionnaires. one of the common things going on behind the scenes on questionnaires is a "misdirect" of sorts. in some cases, phrasing the question in a straightforward way reveals the answer you're testing for (good or bad) in the study, so you try to reword the question to avoid this. a bit of sleight of hand with the information, in a way. it's not necessarily a bad thing in and of itself. without doing this, you immediately jeopardize the validity of the survey.

in the end, we really don't know what the premise of this survey is, and i think this is what is causing everyone discomfort. if we did understand what the premise of the survey is, that would, in effect, serve to skew the results of the survey in a certain way, thus putting its validity at risk.

the fact that it is being hosted by the audubon society is immediately raising red flags for people who dislike some of audubon's goals. i'm almost certain that in return for allowing the student access to their servers to post the survey, they get some information from it. and i quote:

"I am the one that will be analyzing and collecting the data."

what she isn't saying is what access audubon will have to the data once it has been collected and analyzed. i'm fairly certain the student isn't getting something (the use of audubon's web servers) for nothing.

Posted by xxxxx on 08-27-2002, 02:23 PM:

Hmmm....more baloney from the extremists and elite. Sorry Toni, I don't buy it for a minute. I am willing to listen to debate and effect but this one "seems" like a trap.

Seems every time a survey is taken regarding wildlife we the humans end up losing our "rights" "freedoms" or "privillages" (pick one to define your feelings). I personally feel they are "Privillages" to fish, hunt, hike, boat and so on.....

Maybe you could do as suggested and have DUKE sponser your survey. That and clean up the blanket questions and get to the point.

Sorry, no dice here. Pilars Mate.....BANG!!!!!!! No slaughter here, just a shot across your bow. wink wink (this was a joke for those of you without a sense of humor)

On 08-27-2002, 03:16 PM:

i decided to spend a little more time poking around on the audubon website to get more info on the living oceans program that will be receiving data from this survey (it says this right on the survey page, by the way). i'm clicking around on the site when i encounter this link: Living Oceans News: A "Taste" of the Overfished Species List . Guess what are included on this list: "coho salmon and chinook (or king) salmon, many races". perhaps we are right to be suspicious of this survey and its sponsoring organization. yes, anglers need to have their voice heard regarding MPA's. however, i'm not sure that this organization will best represent the interests of recreational fishers.

Posted by MastersStudent (Member # 3047) on 08-28-2002, 08:37 AM:

Thank you all for all your time and thoughts on this. For those of you who question my status as a student you can go to the Duke web site and see that I am one. Yes Duke will provide me with web space for a survey but they will not provide me with the funding to put it interactive on the web and that is what Audubon gave me. In return I will submit to them a copy of my results and thesis paper the same information I will provide you if you fill out my survey. If you read the intro to my survey you will have a better idea of what I am doing. By having my survey on the Audubon web page they also have more traffic on their web site so yes that is another advantage to them.

Thanks for you thoughts,

Toni