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Proceedings of the Workshop on the Management of Protected Species/Fisheries Interactions in State Waters

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Proceedings of the Workshop on the Management of Fisheries/Protected Species Interactions in State Waters

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edited by
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Preface

The majority of papers contained in this report have been written specifically for the report. Some of the papers, however, have been edited from verbatim transcripts taken at the time of the workshop. The "Participant Dicussion and Q&A" sections of the report, which appear after many, but not all of the papers, are also edited from verbatim transcripts.

Acknowledgements

This report is the result of a Workshop on the Management of Fisheries/Protected Species Interactions in State Waters held on July 17 & 18, 1995, in Richmond, Virginia. The workshop was convened and organized by a subcommittee of the Atlantic States Marine Fisheries Commission's Management and Science Committee. As such, a special thank you goes to the members of that subcommittee -- namely, Lew Flagg, Jim Music, Bruce Halgren, and Tina Berger. Invaluable assistance was also provided by National Marine Fisheries Service staff, particularly Michael Payne, Therese Conant, Kathy Wang, Colleen Coogan, and Laurie Silva.

We would also like to extend our appreciation to the session chairs, speakers, work group leaders, and participants of the workshop whose commitment of valuable time and effort helped make the workshop a success.

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Executive Summary

Introduction

The Management & Science Committee (MSC) of the Atlantic States Marine Fisheries Commission convened a workshop on *The Management of Protected Species/Fisheries Interactions in State Waters* in Richmond, Virginia on July 17 & 18, 1995. For the purposes of this report, protected species are threatened or endangered species under the Endangered Species Act (ESA) and marine mammals under the Marine Mammal Protection Act (MMPA). Participants included members of the MSC, representatives of state, federal and academic organizations involved in protected species research and regulation, and representatives of the commercial fishing industry. Objectives of the workshop were to: (1) disseminate current information on the status of federal and state laws; (2) identify and quantify problems relative to protected species; (3) provide information on current status of protected species; (4) identify data gaps; and (5) develop recommendations regarding the role that the Commission can play in the management of protected species in state waters.

Background

The ESA and MMPA mandate that the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) implement measures to manage protected species throughout their range in U.S. waters. Such species are taken as bycatch in most Atlantic coast fisheries, including those which occur in state waters. While not all fisheries interact with protected species, such species have been shown to be present, at least seasonally, in the waters of all Atlantic coastal states. Further, protected species are known to interact with one or more fisheries in almost all jurisdictions participating in the Commission's Interstate Fisheries Management Program (ISFMP).

Statement of Problems

- High levels of fishing effort and high densities of protected species overlap in state waters.
- Mortalities of protected species have been documented with many fishing gears used in state waters.
- The best available data indicate that several protected species cannot sustain current levels of fisheries-related mortality.
- Effective protected species management in state waters by NMFS and USFWS cannot be achieved without expanding cooperation among the federal agencies, the Commission and the jurisdictions that participate in its ISFMP.

- The Commission has not established policies relative to protected species interactions with managed coastal fisheries.

Findings

- Fishing is one of a number of activities that adversely impact protected species.
- Protected species/fishery interactions result in mortalities across many gear types and fisheries.
- Improved communication between protected species managers, state and federal fishery managers and fishery users is essential.
- State and federal fishery monitoring programs for bycatch of protected species are inadequate.
- Gear technology and selectivity research needs to address protected species interactions.
- The migratory nature of protected species and coastal fishery resources necessitates regional coordination to address interactions.
- The Commission's fishery management planning process needs to address protected species impacts.

Recommendations

The Commission should establish policies and programs to address the bycatch of protected species by taking the following actions:

- Amend the ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management planning process;
- Develop a coastwide state/federal cooperative bycatch monitoring program to include protected species;
- Re-activate the Commission's Conservation Engineering Committee to provide guidance regarding gear modifications to minimize protected species/fishery interactions;
- Obtain stable funding to support coastwide state/federal cooperative bycatch monitoring and conservation engineering research in partnership with the fishing industry as appropriate;

- Expand the Commission's education & outreach program to include developments in ESA and MMPA and Commission fishery management plans as they relate to protected species issues;

- Include NMFS and USFWS protected species representatives on species technical committees, and plan development and review teams;

- Charge the MSC with overall responsibility for coordination of Commission activities regarding protected species;

- Coordinate protected species activities, as appropriate, with the Regional Fishery Management Councils;

- Increase Commission involvement in the re-authorization of ESA and MMPAwith respect to fisheries/protected species issues; and

- Address protected species issues on a plan-by-plan basis, using the Shad and River Herring Fishery Management Plan as a model.

Conclusion

On November 2, 1995, the findings and recommendations of this report were presented to the Commission's Executive Committee and ISFMP Policy Board for consideration. All of the above recommendations were adopted, although some recommendations were given greater attention than others. Specifically, the ISFMP Policy Board placed greater emphasis on those recommendations that would most immediately assist the Commission in addressing protected species issues in its fishery management planning process. Those recommendations were to: (1) amend the ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management planning process; (2) include NMFS and USFWS protected species representatives on species technical committees, and plan development and review teams; (3) coordinate protected species activities, as appropriate, with the Regional Fishery Management Councils; and (4) address protected species issues on a plan-by-plan basis, using the American Shad and River Herring Fishery Management Plan as a model.

In adopting the above recommendations, the Commission through its ISFMP Policy Board, composed of a representative from each of the 15 Atlantic coastal states, the Potomac River Fisheries Commission, the District of Columbia, NMFS and USFWS, fully recognized the importance and growing urgency (due to MMPA deadlines) of addressing protected species issues as they apply to state and interstate fisheries management.

Since November 1995, the Commission has amended its ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management

planning process (see revised and approved Charter in Appendix B). It is intended that protected species issues would be addressed much the same way as habitat issues are currently addressed in the Commission's fishery management plans. This means that each fishery management plan would contain a section which describes protected species issues relevant to the fishery in question. This section would most likely include: a list of protected species (both marine mammal and sea turtles) that may interact with the fishery, the type of interaction (by gear, region, season), a review of the population status of relevant protected species, a list of existing and proposed federal regulations and actions pertaining to the relevant protected species, potential impacts to Atlantic coastal state and interstate fisheries, and an identification of current data gaps and research needs. None of the items addressed in the protected species section would require mandatory compliance under the Commission's fishery management planning process.

The Commission has also begun to develop a standard outline and format for inclusion of protected species issues in Commission fishery management plans beginning with the American Shad & River Herring Fishery Management Plan, which is currently under amendment. Additionally, NMFS and USFWS representatives with protected species expertise have been incorporated into the Commission's species technical committees, and plan development and review teams. The Commission will continue to implement the remaining workshop recommendations as resources become available.

Introduction & Opening Remarks

by
Lewis Flagg
Maine Department of Marine Resources

Good afternoon. My name is Lew Flagg. During the past 28 years, I have worked for the State of Maine, Department of Marine Resources, as an anadromous fish biologist. Since most of my work is confined to rivers and estuaries, I have had little contact with protected species outside of the endangered shortnose sturgeon, a species which seems to be abundant and doing quite well in certain Maine rivers.

Last October at its Annual Meeting in Rehoboth Beach, Delaware, the Atlantic States Marine Fisheries Commission (Commission) was approached by the National Marine Fisheries Service (NMFS) to hold this workshop on Protected Species & Fisheries Interactions in State Waters. This task was delegated by the Commission to its Management & Science Committee (MSC), composed of a senior fishery scientist from each of the Atlantic coast states, as well as, a representative from the U.S. Fish and Wildlife Service (USFWS) and NMFS. Mike Street, the Chair of our MSC, was doling out numerous assignments to committee members and I was selected to chair the Protected Species Subcommittee, with assistance from Bruce Halgren of New Jersey and Jim Music from Georgia. After a couple of meetings with the Subcommittee, NMFS, and Commission staff, we have arrived at this meeting and agenda.

Having had little previous contact with protected species issues, I figured I'd better get a little exposure to the issues before this workshop commenced. This past spring my agency was contacted by NMFS to provide a state agency representative to serve on an Aquaculture/Pinniped Task Force. This Task Force was created by Congress to look into problems associated with salmon aquaculture and seal interactions in eastern Maine. I offered my services for this assignment, which turned out to be quite enlightening.

Salmon aquaculture is the second most valuable marine fishery in the State of Maine. Harbor seal populations, which prey on Atlantic salmon in sea cages, have grown dramatically in Maine over the past 20 years. To make matters even worse, the concurrent growth of seal populations and Atlantic salmon culture have been accompanied by a dramatic decline in wild salmon populations in eastern Maine. NMFS/USFWS are in the process of proposing to list Maine wild salmon populations as either threatened or endangered, under the Endangered Species Act (ESA). Since aquaculture escapees are considered a potential threat to the genetic integrity of wild salmon populations and the aquaculture industry would like to be allowed lethal take of selected seals to preclude losses from seal attacks, this industry is faced with serious problems. More on this subject will be presented later in this workshop by Jeff Kaelin.

In working with the Aquaculture/Pinniped Task Force, I have gained a lot of knowledge about salmon aquaculture, marine mammals, and implications of the ESA. I've also gained a great appreciation for the various interest groups, including the fishing industry, marine mammal protection advocates, and particularly the state and federal resource agencies which are caught between these divergent interest groups.

The specific objectives of this workshop are to: (1) disseminate current information on the status of state and federal laws; (2) identify and quantify problems relative to protected species; (3) provide information on the current status of protected species; (4) identify data groups; and (5) develop recommendations on the role the Commission can play in the management of protected species in state waters. A proceedings of this workshop will be developed to include an identification of the key issues and concerns, and recommendations for state and Commission action. These findings will be presented to the Commission's Interstate Fishery Management Program Policy Board and Executive Committee for review and discussion at the Commission's 54th Annual Meeting in Charleston, South Carolina.

I hope this workshop will shed more light on the issues, allow us to better understand the challenges before us, and work towards making more efficient use of scarce resources to address and resolve these important issues. The workshop is divided into three sessions: Session I will be an overview of protected species, federal and state legislation, a summary of Atlantic coastal programs, and a presentation on the Commission's views on protected species management. Session II, beginning tomorrow morning, will cover Protected Species/Fishery Interactions and commercial fishing industry concerns. Session III, tomorrow afternoon, will cover ongoing monitoring and management programs. At the end of Session III, the real work begins for me. I will moderate an open discussion on developing a cooperative state/federal protected species monitoring and management program. I hope you will all assist me in developing thoughtful and sound recommendations on how we can work together to meet the needs of protected resources and the fishing industry.

Again, welcome to this Protected Species Workshop. I look forward to working with you on this important issue.

SESSION I: PROTECTED SPECIES OVERVIEW

Legislative Overview: The Marine Mammal Protection Act (Section 118)*

by
P. Michael Payne
National Marine Fisheries Service
Office of Protected Species

I would like to thank the members of the Atlantic States Marine Fisheries Commission (Commission) and the Management and Science Committee for convening this workshop. Before I begin, I want to make a few other announcements.

One thing that Lew stated, that became obvious to me at that October meeting in Rehoboth, is that members of this particular committee and this Commission have not dealt with protected species issues a great deal in the past. So, if you have any questions or comments please feel free to interrupt me during the presentation at that time

I will address recent changes in the Marine Mammal Protection Act (MMPA) that occurred in 1994; some of them had very significant consequences to the states. My colleague, Kathy Wang, from the Southeast Region, will address the Endangered Species Act.

The section of the MMPA that deals primarily with state issues is Section 118. When I presented this information at the workshop back in October -- we did not really know what to expect. What I tried to do there was bring the issues of protected species management under the Endangered Species Act (ESA) and the MMPA to the attention of the Commission's state members. I also wanted to discuss recent changes in both the ESA and MMPA which will effect the Atlantic coastal states. My interest in coming to the Commission was to create a process which would ensure the protection of marine mammals and sea turtles taken incidental to state fisheries. My objectives were twofold: (1) to develop a relationship between state and federal agencies to develop fishery management principles that address protected species issues in state waters; and (2) incorporate protected species standards into the Commission's fisheries management planning process, as established by the Interstate Fisheries Management Program Charter.

The MMPA, through Section 118 and the recent changes, set up a system whereby the National Marine Fisheries Service (NMFS) is mandated to develop, with the cooperation of many parties, including states, a plan to reduce bycatch in those commercial fisheries that take protected species at unsustainable levels. Most immediately, we need to begin to collect information on those fisheries where we either know or believe the bycatch of protected species is occurring, but do not know the extent of the bycatch. This is either because state and federal agencies have not

* text edited from verbatim transcripts

implement the team's plan. This plan will be submitted to NMFS as a consensus recommendation that NMFS has to implement.

Take reduction teams themselves are spelled out fairly clearly in the MMPA. They have to consist of the following groups: federal agencies (in this case, NMFS and the U.S. Fish and Wildlife Service (USFWS), in some cases, any other federal agency that is involved in either regulating commercial fisheries or a fishery-related activity. Additionally, the take reduction teams should have a representative from each coastal state that has a fisheries interaction with a strategic stock. If the state does not want to participate on the team as an individual state, they can choose to represented by a number of sources like the Commission. Other team members can include representatives from regional fishery management councils, environmental groups, scientific academicians, and commercial and recreational fishermen; and in the case of Alaska only, Alaskan native groups. By and large, there will probably be between 15 and 20 people on a team to try to reach consensus on how to reduce bycatch.

These teams will get together and develop take reduction plans for those stocks which interact with Category 1 fisheries under the MMPA and commercial fisheries that have a high level of mortality across several marine mammal stocks. For example, the offshore driftnet fishery for pelagics, which takes about seven to eight different stocks of marine mammals. The alternative is either to have a plan for each one of those stocks or to develop a plan for the fishery that takes those stocks. In this case we are opting for the fishery.

Here are some definitions. I think most of you are familiar with this, but I will go over it briefly. **Strategic stock:** These are the stocks that we are concerned about primarily under the MMPA. A strategic stock of a marine mammal under the MMPA is a stock where the human cause mortality exceeds a value called **"potential biologic removal,"** a calculated number based primarily on the abundance of the stock, the level of mortality, and a recovery factor.

In the coastal waters of the mid-Atlantic there are two stocks of immediate concern -- harbor porpoise and coastal bottlenose dolphin. There has also been an increase in the number of strandings, at least, some of them tied to fisheries, of large whales in coastal mid-Atlantic waters.

Another strategic stock is one where the stock is declining and is likely to be listed as threatened under the ESA. Certainly this pertains to porpoise. It is being proposed as threatened and it may be; it is still being discussed. Any population listed under the ESA is a strategic stock by definition. Large whales such as coastal bottlenose dolphin, for example, are designated as depleted under the MMPA.

In terms of the take reduction team, what kind of schedule are we looking at? There are six teams proposed at this time. These teams have been selected based on known level of takes, and that level of take is indicated by observer data, by stranding data, or by direct logbook data.

Harbor porpoise is the species of greatest concern at the moment, because the potential biological removal is exceeded by three or four times. The best estimate of bycatch in the Gulf of Maine gillnet fishery is about 1300 harbor porpoise. The Gulf of Maine population of harbor porpoise extends down to North Carolina, even though it is referred to as the Gulf of Maine population. In the winter, the distribution is not known nearly as well as it is in the summer. We do know, however, that along the coastal waters of the mid-Atlantic harbor porpoise are taken and stranded as far south as North Carolina. So this is an animal that should be of immediate concern, certainly, to the states, and, hopefully, to the Commission.

The other group of concern is large whales. We know they are taken to some extent by inshore fisheries (out to three miles from shore). There have been some gillnets found on some of the stranded animals in the mid-Atlantic.

This is the schedule that we are looking at, and this is important to the subcommittee on protected species. NMFS just completed (Friday) receiving proposals to develop these teams. We conducted a pilot project last spring and NMFS has contracted with Resolve -- who may have already contacted many of you -- to set up these different take reduction teams and determine what should be discussed by these teams.

Resolve received input from a lot of people on the committee and, based on that small-scale project, we went out with a much larger one to address teams for both the east and west coasts. Almost everyone who spoke with Resolve supported the use of an outside facilitator to mediate these teams. Most of the team members for the east coast teams. The teams will have to be in place by October.

Once the teams are in place, they have four to five months to develop a plan. There is then a period of about two months where the plan is reviewed and open for public comment. The final plan would then be developed and implemented in place about eight or nine months, and then we have a year to see whether or not it actually works, kind of an implementation period.

After the plan is developed, the team will meet on several occasions to review the plan and recommend any changes. It is actually an overambitious schedule for everybody involved. It is very likely that during that four-month period when the team meets -- for example, if Mike Street sat on a team, or two teams, maybe, you would probably meet at least six times during that four-month period for one or two days of meeting. That is the type of thing that we are looking at.

We would like the teams to reach consensus. There will NMFS representatives on all the teams. If something is reached by consensus on a team it will be forwarded to the administrator for Fisheries for his approval. If, however, no consensus is reached, NMFS will still have to develop a plan. We will probably go back to the minutes of those meetings and look for majority and minority type opinions to try to do it.

This is a very open discussion. In dealing with trying to understand state fishery interactions, I realized that I do not know very many of the state fisheries. Also, I do not know how the state fisheries work, and I did not really understand how the state fisheries work both individually and within the Commission process, but I am slowly learning.

If you have any questions throughout this workshop, please ask. The worst thing anyone can do is to leave this workshop with questions unanswered. For the next day and a half there will be considerable discussion, and then the final day will be for the MSC discussion. In that regard you are free to go home tomorrow night. If people stay, the Commission meetings are public -- at that point I will be considered part of the public (I will be in the background, listening, unless they address questions to me specifically) -- so you are all welcomed and encouraged to stay on Wednesday.

Participant Q&A and Discussion

MR. KAELIN: What gear interacts with the large whales in the Gulf of Maine?

MR. PAYNE: I believe that the main gear is coastal gillnet, which primarily targets dogfish.

PARTICIPANT: How many of the six species of concern are east coast species?

MR. PAYNE: Four out of the six, three of which directly affect the states.

MR. STREET: I have a question about the take-reduction teams? Who sits on them and how are they composed?

MR. PAYNE: For the two teams that already being developed, Resolve, a contracted facilitator, provided a list of fisheries people that they thought would be good candidates for the teams. Each list consists of about 30 people, which may be too many for a team. What we would like to do is contact those individuals to see who would be interested in participating on a team. For example, if there are four or five fishermen who believe that one or two can address their issues, we would prefer to work with the selected individuals. The scientific people may be brought in as advisers rather than actually sitting on the team. In some ways, this is actually more desirable, since they would be separate from developing the actual management regime.

MR. STREET: But you are not looking at a whale team on the east coast yet?

MR. PAYNE: Not yet. We will be in about two months. You will be contacted. Actually, it is something that will be addressed later.

MR. ZAWACKI: Are all strandings assumed to be the result of commercial fishing gear interactions?

MR. PAYNE: No, very few. As a matter of fact, depending on whether you believe they all are or not is independent of what would go on. In the last two years the National Marine Fisheries Service and a lot of other groups -- a number of whom are here today -- have gone out of their way to try to find ways to determine whether a stranding is a fishery-related mortality or not. The majority of strandings go categorized as undeterminable, especially for marine mammals.

When people come up tomorrow and talk about some of their data, you should ask that question, again. However, it is assumed that if animals have gear on them when they come up, that the gear is the cause of injury or death.

Endangered Species Act

by
Kathy Wang
National Marine Fisheries Service
Southeast Regional Office

For this presentation I am going to try to explain Sections 6 and 10 of the Endangered Species Act (ESA) for you and try to demonstrate what it can do for your states' endangered species programs. I am going to give a brief overview, so if you have questions on details, be sure to stop me and ask anything you want.

Section 6

Section 6 is all about cooperation with the states. In the language of the Act, it says, "In carrying out the program authorized by this Act, the Secretary" (and that is the National Marine Fisheries Service or NMFS) "shall cooperate to the maximum extent practical with the states." So Congress told us we have to cooperate with you.

Section (b) of the Act is something we have not really done, to my knowledge. It sets out language for management agreements. It says, "The Secretary can enter into agreements with any state for the administration and management of any area established for the conservation of endangered or threatened species." Probably the best example where this would work would be in a critical habitat area, such as for right whales in Georgia and Florida. We do have cooperative agreements with Georgia and, hopefully, soon, Florida. We actually work with them through a cooperative agreement, though, and they do a lot in that critical habitat area for us in terms of managing it. Another possibility would be, say, a state marine sanctuary.

Section 6(c) is the main part of the Act, the cooperative agreements, and the purpose of this section is to assist the state in implementing its endangered species programs. We should have cooperative agreements between the federal agencies and the states. Just briefly, there are five major requirements that a state needs to demonstrate to us in order to form this cooperative agreement. Sounds easy, right?

> The first is the state needs to demonstrate that the authority resides in the state through state statutes or some other mechanism, that they have the authority to conserve the resident species of fish and wildlife, species that are determined by the state agency or the feds to be endangered or threatened.
>
> The second requirement: The state agency needs to determine that they have established acceptable conservation programs for all resident species of fish and wildlife in the state

that are deemed to be endangered or threatened. Also, the agency needs to furnish to us a detailed copy of their endangered species plans and their program to conserve endangered species.

The third requirement: The state agency must be authorized to conduct investigations to determine the status and requirements for the survival of resident species that are endangered or threatened.

The fourth requirement: The state agency must be authorized to establish programs for the conservation of resident endangered or threatened species.

Finally, the state needs to make provision for public participation in designation of resident species on their endangered species lists.

So these are the five requirements necessary in order for NMFS to be able to determine that a state has what we call an adequate and active conservation program. We need to reaffirm this finding annually in order to maintain a cooperative agreement, once it is established. Establishment of a cooperative agreement allows a state exemption from prohibitions under Section 9 of the ESA under special conditions that would be stipulated in the agreement. The major incentive here is that it makes for funding; through a cooperative agreement we can fund certain endangered species programs to a state.

This funding can be for a number of things: research, monitoring, management programs, educational programs, education, just about anything that is identified in a recovery plan. If it is an action item that we think needs doing, we can fund it through one of these agreements. The federal share of the funds, once the state agency submits to us an application, their grant proposal, we can fund up to 75 percent of the estimated cost of that program. If two or more states cooperate in management of a particular species, such as Georgia and Florida in the right whale critical habitat in the south, the federal agency can fund up to 90 percent of those programs. So this is good. It engenders not only cooperation between the states and the feds but among the states. But it is all advantageous to be cooperative.

Section 10

Section 10 allows for authorization of incidental take permits in things such as a fishery, so it is not necessarily a research program but it is when you are fishing and you accidentally take a turtle or something. This can be authorized. These Section 10 permits can be either individual or general. An individual permit can be issued either to an individual or to a regulatory authority such as a state agency or a fisheries commission. The state or regulatory authority must demonstrate that their fishing regulations will comply with terms and conditions of the permit, if issued. If that is accomplished, then the state can assume management of their own industries that impact endangered or threatened species.

General permits, on the other hand, can be issued to an organization that does not have regulatory authority, such as a sports fishermen's group or something. Then individuals will fall under this general permit through certificates of inclusion.

There are certain conditions under which we could issue a Section 10 permit. NMFS would need to make a determination that the take will be incidental to an otherwise lawful activity. The application needs to be submitted with certain necessary information. The first and foremost requirement in this is the development of an acceptable conservation plan, and I will explain that in a minute. Also, NMFS would need to make a determination that the level of take will not jeopardize the continued existence of endangered or threatened species in reviewing the application.

Just briefly, the application procedure: Just so that you know in the beginning, if you are putting together an application, you can call us at the regional office, either me in the southeast, or Laurie Silva in the northeast, and we can help you out in putting together your application before it is submitted. Your application, of course, has to include the name, address, and telephone number of the applicant, and also try to identify a contact person. You need to specify the type of application, whether it is individual or general, list the species to be taken, including the common and scientific names. Then along with this you should provide information about the species status, the distribution, habits, habitat requirements, that type of thing, and then include a detailed description of the lawful activity that would be authorized, and then present a conservation plan.

The conservation plan needs to describe the anticipated impact on the species or the stocks to be taken. It should identify steps that will be taken to monitor, minimize, and mitigate take. It should describe funding that is available for implementation of the monitoring programs or enforcement, and should give a thorough discussion of alternatives that were considered and why they were not used, and then include a list of all sources of data used to put together the plan.

The criteria, then, that we would use to determine whether or not to issue it: We would look at what the present status of the species or stocks to be taken is. We would look at what the likely impact of the activity would be, and not just direct impacts, but indirect and cumulative. We would examine what the availability and effectiveness of the monitoring program that is proposed would be. We would try to determine whether the best available technologies to minimize and mitigate impacts are being used or proposed to be used.

Then we would also look at what the public comments are, because when you submit an application and it is deemed to be complete, then we would submit it to the Federal Register for a 30-day comment period.

Lastly, when you get your permit, it will have certain conditions attached. It will include reporting and inspection requirements. It will specify the species that you are authorized to

take, and the number. It will specify the authorized methods for this take, such as the particular fishing method. The permit will also set forth procedures for disposition of the animals taken, whether they are to be given to the stranding network or buried or some other thing. We may impose fees, but we have not done that so far. Finally, the permit will have some type of time limit to it.

Participant Q&A and Discussion

MR. THEILING: Could you give us some examples of incidental take permits that have been issued under Section 10, and indicate whether they are effective for public and private lands and waters?

MS. WANG: Our agency so far has given permits mainly to the western states, like Idaho and Washington, for fish hatcheries, because the hatchery salmon are considered to be competing with the wild salmon. We have not really issued very many of them yet. I believe that first one was issued in 1992.

MS. MURPHY: Permitted takes are not necessarily lethal in nature. For example, the Marine Resources Monitoring Assessment and Prediction Program (MARMAP) and the Southeast Area Monitoring and Assessment Program (SEAMAP) have to apply for these same permits in the likelihood they take turtles or marine mammals offshore during their surveying operations.

MR. STREET: One of the things that is listed here is mitigation. In the context of protected species, what is mitigation?

MS. WANG: If you can develop an alternative type of gear technology that would be taking fewer animals.

MS. COOGAN: What they are planning on doing in New England with the groundfish gillnet fishery is sort of mitigation. One of the things they are considering is closing some areas to that type of gear. You might still be taking them in other areas, but you are mitigating that by reducing take in the higher occurrence areas.

MR. PAYNE: I perceive that as a reduction of take. Mitigation, whether it be through technology, gear development, closures, is still something to reduce take.

MS. WANG: It is not quite the same as if you dig up this mango forest, you can replant one here.

MR. LAPOINTE: That was suggested by the Gulf states for turtles through the headstart program. That is a good clarification to make, because the idea there was kill a thousand, produce a thousand. I do not know if that ever got off the ground or not, but it certainly was suggested.

MS. WANG: If we could find something like that that could work, then we would be all for it, but so far we found that does not work.

MR. STREET: You are talking about permits for states to essentially assume management of a program. This is not the same as the permits that are received by various groups for research purposes, like the aquaria for handling dead carcasses or salvaging, that sort of thing, because you have not mentioned that at all.

MS. WANG: Right, those are research permits.

MR. STREET: Which section of the Act are they under?

MS. WANG: Ten, but it is a different section of 10.

DR. MUSICK: We had a problem with NMFS a few years ago in that the state of Virginia's management and regulatory authorities for marine resources are seated in two different agencies. The Virginia Institute of Marine Science (VIMS) is the agency that has been mandated to do research and monitoring and the Virginia Marine Resources Commission (VMRC) sets regulations and has the law enforcement officers in the marine environment. I applied for a Section 6, using Ms. Murphy's Section 6 agreement from South Carolina as a model. There is a section in there about law enforcement and VIMS could not do that, because we are not mandated to do that, and I just never heard from NMFS; they never even bothered to answer me.

MS. WANG: I do not know if it ever got out of general counsel.

MS. SILVA: You actually have three groups, because you also have a third wildlife group that handles ESA issues, so there were three levels of confusion, and I do not think the lawyers ever got beyond whether or not there was a qualification under No. 1, which means that the authority resides in the applicant state agency to conserve resident species of fish and wildlife.

DR. MUSICK: Well, the authority is pretty clearly identified within the state itself, that the Division of Game and Inland Fisheries has no jurisdiction in the marine environment, period.

MS. SILVA: I know, it was the fact that there were three, so then it was between the other two and --

DR. MUSICK: The question is, we just finished putting together a conservation plan for marine mammals and endangered sea turtles, and that is a cooperative plan that is put together by the three major state agencies with a lot of input from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. We had input from the Science Museum and several other independent universities and organizations in the state. That management plan is being stonewalled at the Secretary of Natural Resources office here in Virginia. It pretty well outlines quite clearly the different roles that each of the state agencies plays in the state, and it is just defining what was there, because that was already on the books. In essence, VIMS has been doing the turtle monitoring and sending in reports to the stranding network since 1979. VMRC

has yet to really become involved and enforce the conservation plan. We would like to reapply for Section 6 with two state agencies, or perhaps three, listed in the agreement. Can we do that?

MS. SILVA: I have something to say on that. We have just sort of resurrected the whole Section 6 issue. The poor state of Massachusetts has been working with us over the last year or so to try and get their application through. This is one of the main things that has come up, is that in the different states the marine and fresh water fisheries, there are two or three agencies that handle all the different critters, and that is how you run into these problems. Headquarters has tried to direct certain people in certain positions to get some guidelines together so that the regions could do more of the work on their own. What we have been trying to do in the northeast is to use this Massachusetts application as kind of template for what is to come. So it is improving and we are going to really start pursuing it within the next year, and I am your contact. I hope we will be able to move a number of these through. We see this as really important. These are tough fiscal times and there are not enough people to do the work; the states could certainly help in that area.

The southeast region has had some great success with South Carolina. The whole process is being resurrected and I really encourage you to try -- if you submitted anything before -- and work with us again.

MS. WANG: Yes, I meant to point out earlier that it really is an opportune time at the moment, because it is a big thing in Congress right now, downsizing the federal government and trying to delegate things to the states, so this is the time to make your move.

MR. LAPOINTE: Three observations. My past job was with the International Association of Fish and Wildlife Agencies, and when it gets to a situation like Jack talked about, where there are more than one state agency, it seems like the process would go a lot smoother if the applying state develop a cooperative agreement between its various agencies as to which agency would take the lead.

Secondly, I have heard a lot about downsizing the federal government. The same thing is happening in state governments, so we should not rely too much on the strength of that argument.

Last, we keep on mentioning funding, and if we are completely honest, I mean that should not be that big a carrot right now, should it? Again, from my experience at the international level, there was a lot of competition for Section 6 funding and there was not enough to go around. The states were clamoring for more. That is just a reality check and should not hold up the discussions of us trying to do things, but it is a fact.

MR. PAYNE: I think he is correct, but maybe not for the reason he thinks he is correct. The funding will probably go down, but I do not think funding should be the carrot to do this. I

mean, that is kind of secondary. Whether there is funding there or not, we are here to work together. We could force things, but it would make it unpleasant for everybody. We do not want to do that, because we do not have money.

MR. LAPOINTE: I concur.

DR. MUSICK: If you think it is bad on the federal level, you ought to come to the state of Virginia right now. I mean, in general, I am not talking about money. The Game and Fish Commission cannot mention the term "endangered species."

MR. FLAGG: I certainly concur with Mr. Payne that the funding should not be the carrot. I think the carrot is that regardless of how we may feel about the issues concerning ESA or protected species, they are going to continue to happen and they can happen with or without input. I think that is where the real carrot comes in, is that the states can have some degree of control over the process.

MS. WANG: By the same token, we admit that we do not have the multi-million dollars that the U.S. Fish and Wildlife has in their appropriations for Section 6, but NMFS is currently pushing for a two million dollar budget for Section 6. I cannot tell you what is going to happen.

MR. LAPOINTE: I think there are a number of avenues that we can explore that make for productive and efficient protected species programs. To go back to Mr. Flagg's comment, we have to do it whether it is funded or not. I think those are things we should really think about separate from the funding question.

MR. PAYNE: I agree with that completely. Another thing is this is not just a protected species issue, but a larger issue of bycatch, which most state fishery agencies have been dealing with. For the past 20 years protected species concerns have had to consider fishery plans and fishermen. I would like to think that we are at a point where it is a two-way street and any improvements in the recovery of protected species will enhance all bycatch issues, whether they be fish, nongame, or protected species.

MR. FLAGG: I think one of the other important points here is that as these federal laws change and evolve, the fishery agencies are required to react to what is being proposed. I think we should try to get more proactive in terms of getting people to understand what the constraints are within the industry and how they can deal with these various issues and make this process a dynamic one.

DR. BLAYLOCK: I just wanted to make the point related to the MMPA amendments. I do not know if Mr. Payne had a reason for not mentioning this or not, but under the MMPA the National Marine Fisheries Service is mandated to reduce fishery-related mortality and serious injury to rates approaching zero mortality within seven years from enactment of the

amendments. That has been defined, at least now, for working purposes, to be 10 percent of potential biological removal. That is a small number for a lot of species, so that is another carrot. NMFS is going to have to do that, whether or not the states work with them.

MR. STREET: It seems to me, just from what we have heard so far, that the National Marine Fisheries Service needs the states' cooperation in order to carry-out many of its programs. And I think the states need some things from the National Marine Fisheries Service as well. This is a good reason to get together.

MR. PAYNE: Colleen (Ms. Coogan), is there any need to discuss anything under Section 7 with this group?

MS. COOGAN: There is funding to the Atlantic States Marine Fisheries Commission and there is probably also other funding sources used by projects under the Commission's observation. Anything that we fund we have to do a Section 7 consultation. There may be effects to listed species. If you are managing fisheries that may affect listed species, technically, we should be consulted formally on the impacts of those fisheries. Also, we could, for endangered species, just manage the fishery ourselves. We can go to the beach under the ESA, which is something that we do with the shrimp fishery. It is currently done with the summer flounder fishery. It is generally not very popular, especially when it is first done, if you do not do it with cooperation from the states. We would actually prefer the states to be involved in the planning rather than us coming in and blindsiding people. So there are ways for these things to be done under ESA, but that is not really our goal.

MR. LAPOINTE: For marine mammals, doesn't Section 7 seem redundant to the incidental take language in the Marine Mammal Protection Act?

MS. WANG: Section 7 only applies to the endangered marine mammals.

MR. LAPOINTE: I understand that. Then just a question, Colleen. What do you mean by summer flounder management to the beach by the federal agencies?

MS. COOGAN: For sea turtle impacts we require south of Cape Charles. The first couple of years we tried to do it with the state managing within three miles. We did not have the mechanism to give them a Section 10 permit at that time, so the takes were not entirely legal.

PARTICIPANT: On the individual permits you had 75 percent funding and the joint permit up to 90 percent. In what sort of situation would the federal government charge fees?

MS. WANG: The fees would be for a Section 10 permit. The funding is for an agreement under Section 6. For a research permit we charge $25.00, just for all the administrative processing. It does not anywhere near cover it.

MS. BERGER: May I get one clarification? It sounds like the similarity between Section 6 and Section 10 is that, one, they both require conservation plans, correct?

MS. WANG: Section 6 does not really require a conservation plan. It is a different kind of thing. A conservation plan is to describe how you are going to mitigate these takes somehow, whereas under Section 6 you are describing your state endangered species research program and what is being done in your state to conserve these species.

MS. BERGER: Where I was coming from with this is that it would make sense, if that were true, that states should apply for Section 6, because then they could still get money to help in their applications for Section 10 and working together.

MS. COOGAN: One will really facilitate the other. If you state's Section 6 agreement clearly has a conservation program in place and you come in with a plan, it would probably get approved faster than if you came with no familiarity with the program and vice versa.

MS. MURPHY: One thing a Section 6 cooperative agreement does is it allows the state to take over some permitting authority, so you can make people agents of the state without their having to apply for a federal permit.

MR. LAPOINTE: Just a thought in talking about Sections 6, 7 and 10 under ESA. My first recommendation for this workshop would be a summary, a short readable summary of the applicable federal laws as they apply to state fisheries protected species programs so people here and my state commissioners and my staff can all better understand the program and it might be something that would fit in well with our newsletter in the future as well. I have talked about it before, you just showed it to me on slides and, frankly, I am in a bit of a fog. That is probably a personal liability, but it would help to have something like that as we continue these discussions. I believe if we could take the information from that, three or four pertinent pages, and really distill it down so that folks who are not going to read this big document could get hold of it, it would be very good.

MR. PAYNE: It is easier said than done. I tried to do a flow chart to do exactly what you said, nice and easy, and I quit. But before the meeting is over, maybe we can do it. We can at least try.

MR. FLAGG: I think, really, the trick to getting the states involved and cooperating in this is if you can demonstrate that there are some real benefits to state fisheries by moving this process into one where decisions can be made at the local level, at the lowest level possible, where people are really familiar with the fisheries and what types of constraints they are working under. I think that is going to be the way to get states interested; show them that there are, in fact, substantial benefits to be gained by the states and by their fishing industry by being partners in the process, even if states have to come up with money to do that. If there are benefits for the

states, I think there will be serious consideration. If they look at this as a bad thing, if there is a real down side to it, if the adverse impacts outweigh any benefits that might be gained, there is no way the states are going to be involved.

New England Regional Overview of State Laws/Programs Related to Protected Species Conservation & Management

by
Lewis Flagg
Maine Department Of Marine Resources

Most of the New England states have very similar state programs related to Protected Species, so I'm going to spend most of my time discussing Maine's program, with which I am somewhat familiar.

The primary agency responsible for the administration of protected species laws and programs in Maine, is the Maine Department of Inland Fisheries & Wildlife (IFW). The Maine IFW has a cooperative agreement with the Maine Department of Marine Resources which states that the Commissioner of IFW will only consider listing or delisting a marine species when the Department of Marine Resources requests that such action be taken.

Maine's nongame and protected species legislation (Title 12 M.R.S.A. § 7751) declares that the Legislature finds various species of fish and wildlife have been and are in danger of being rendered extinct within the State of Maine, and that these species are of aesthetic, ecological, educational, historical, recreational, and scientific value to the people of Maine. It is the policy of the state to conserve, by according such protection as is necessary to maintain and enhance their numbers, all species of fish and wildlife found in the state, as well as the ecosystems upon which they depend.

The Maine IFW, through the Commissioner, is charged with conducting investigations to determine population size, distribution, habitat needs, limiting factors, and other biological/ecological data relating to the status and requirements for the survival of any resident species of fish or wildlife, whether endangered or not. All federally listed threatened or endangered species are considered to be on the state listing.

Programs: The Commissioner may develop programs to enhance or maintain these populations.

Designation of Endangered Species: The Commissioner shall designate a species to be endangered or threatened whenever he finds one of the following exists:

A. Present or threatened destruction, modification, or curtailment of its habitat or range;

B. Over-utilization for commercial, sporting, scientific, educational, or other purposes;

C. Disease or predation;

D. Inadequacy of existing regulatory mechanisms;

E. Other natural or man-made factors affecting its continued existence in the state.

In making a threatened or endangered species designation, the Commissioner must:

1. Use the best scientific, commercial, and other data available;

2. Consult with other state agencies, federal agencies, and other states having common interest in the species; and interested persons/organizations;

3 Maintain a state list. The list may be added to or deleted from only after notice of proposed listing or delisting and a public hearing has taken place.

Conservation of Endangered Species: The Commissioner may establish such programs as are necessary to bring any endangered or threatened species to the point where it is no longer endangered or threatened, including:

1. Land acquisition for habitat

2. Propagation

3. Live trapping

4. Transplantation

5. Regulated taking

Habitat Protection: The Commissioner, by rule, may identify areas essential to the conservation of a species and require special management considerations.

Protection Guidelines: The Commissioner, by rule, may develop guidelines for the protection of species designated as threatened or endangered.

Cooperative Agreement: The Commissioner may enter into cooperative agreements with federal agencies, state agencies, other states, state political subdivisions, or private persons to establish and maintain programs for conservation of endangered or threatened species and may receive federal funds allocated for obligations to the state pursuant to these agreements.

State and Local Cooperation: A state agency or municipal government shall not permit, fund, license, or carry out projects that will:

1. Significantly alter identified essential habitat

2. Violate protection guidelines for a listed, threatened, or endangered species. A variance may be granted to state agencies and municipal governments by the Commissioner if he finds that the proposed action will not pose a significant risk to any endangered/threatened population, and a public hearing must be held on the proposed action.

Prohibited Acts: It is unlawful to:

A. Export any endangered or threatened species from the state;

B. Hunt, trap, or possess any threatened or endangered species within the state;

C. Possess, process, sell, offer for sale, deliver, carry, transport, or ship any endangered or threatened species; or

D. Deliberately feed, bait, or harass any threatened or endangered species.

Exceptions: The Commissioner may permit any act prohibited by this section for educational or scientific purposes or to enhance the propagation or survival of an endangered or threatened species.

The Commissioner may permit the transportation of a threatened or endangered species through the state if it has been obtained from outside the state, and is being transported to a point outside the state in accordance with any federal or state permit.

Maine Endangered and Nongame Wildlife Fund: The fund is established to receive private contributions through the voluntary Maine income tax check off program and other private contributions. In addition, the fund now receives four dollar of every $20 fee from conservation motor vehicle license plate sales. These funds are to be used exclusively for endangered/threatened species and nongame wildlife programs.

During the recent session of the Maine Legislature, a law was passed which now requires legislative oversight of the endangered/threatened species listing process. The procedures in current law remain the same, but all recommended listings will now need to receive final approval by the Maine Legislature.

Table 1: Status of State Protected Species Programs in New England

State	Agency w/Program Responsibility	State List Established	Funding Sources	Program Coordination w/Marine Agency
ME	IFW	Yes	B,C,D	Yes
NH	NHF&G	Yes	A,B	Yes
MA	MADFW	Yes	A,B,C,D	Yes
RI	RIF&G	Yes	B,C,D	Yes
CT	DEP	Yes	A,B,C,D	Yes

Key to Funding Sources:

A=Legislative Appropriations (General Fund)
B=Voluntary Contributions (citizens, corporations, private groups)
C=Income Tax Check Off
D=Other (conservation license plate revenue, wildlife art sales proceeds, etc.)

Overview of Mid-Atlantic Coastal Programs

by
Bruce A. Halgren
New Jersey Division of Fish, Game & Wildlife

Tom Wilcox and I were asked to provide an overview of the protected species programs in the Mid-Atlantic area. I will be giving a brief summary of the state programs for New York, New Jersey, Delaware, and Maryland. Tom will present Virginia's program in a bit more detail.

I found that the protected species programs varied considerably among the states. There were, of course, many similarities as well. All of the states were involved in one way or another with marine mammals, sea turtles, and endangered or threatened marine fish, such as shortnose sturgeon. All of the involved organizations worked under the framework authority of the Marine Mammal Protection and Endangered Species Acts through cooperative agreements, letters of authorization or permits from both the National Marine Fisheries Service and the U.S. Fish & Wildlife Service. States typically had legislative authority over state designated threatened and endangered species. Private organizations normally work under state sanctioned scientific collecting permits. One additional common element was the involvement of private, non-profit organizations in stranding response and live animal rehabilitation.

I will discuss the state programs from north to south, starting with New York.

New York

The New York State Department of Environmental Conservation's Division of Fish and Wildlife operates a marine mammal and sea turtle stranding program in cooperation with the Okeanos Ocean Research Foundation, Inc. The program responds to about 700 calls and handles approximately 350 animals per year. All animals are identified by species, measurements taken, cause of death determined when possible and observations made regarding potential human interaction. Live animals requiring rehabilitation are taken to the Okeanos facility and arrangements are made for proper disposal of deceased animals.

The Division also supports studies on sea turtles and shortnose sturgeon. The sea turtle project, being conducted by researchers from Cornell University and Buffalo State College, is designed to identify fall migratory patterns of sea turtles captured in New York waters. The two year study will monitor a minimum of four turtles per year. The target animals are loggerhead turtles in excess of 50 m carapace length. To each turtle will be attached a satellite-linked time-depth reorder with a transmission duration of approximately 100 days.

Prior studies have shown strong similarities in both temporal and spatial migratory patterns between loggerhead and Kemp's ripley turtles. It is thus anticipated that behavioral information from this study could be used in recommending conservation measures for both species.

The shortnose sturgeon program, conducted by the New York cooperative Fish and Wildlife Research Unit, supports recovery plan goals to assess current population levels and historical trends in abundance.

Incidental catches from other monitoring programs suggest that within the Hudson River system, populations of shortnose sturgeon may be far more abundant than that of the Atlantic sturgeon. The program will conduct a standard mark and recapture study based on sampling from March through November. Effort will be conducted on overwintering and spawning concentrations in the Kingston and Troy Dam areas respectively early in the year and throughout the tidal portion of the river subsequent to the spawning period.

Approximately $40,000 from income tax contributions support the Division's stranding program. The Okeanos Ocean Research Foundation has an annual expenditure of about $60 to $80,000 to support stranding response and rehabilitation activities. The sea turtle project is funded through Endangered Species At grants at an annual level of approximately $30,000 and the shortnose sturgeon program is funded at a level of approximately $100,000 by the State Conservation Fund.

New Jersey

In New Jersey, most of the marine mammal and sea turtle strandings are responded to by the Marine Mammal Stranding enter, a private, non-profit organization enter personnel are on all 24 hours per day, seven days per week. When stranded animals are dead or subsequently die, necropsies are conducted to determine cause of death and all animals are examined for possible human interaction. Arrangements for proper disposal are also made.

Approximately 110 to 120 strandings are investigated annually with a slightly increasing trend. Many more calls are responded to which involve healthy animals requiring no assistance. Pinnepeds, primarily Harbor and Harp seals, represent much of the recent increase in calls involving both healthy and stranded animals. Animals requiring rehabilitation are transported to the center's facility in Brigantine or to larger facilities such as the National Aquarium in Baltimore, if larger cetaceans are involved. Approximately 47 seals have been held for observations and rehabilitation so far in 1995 with an 87 percent recovery and release rate.

The Center has a small full-time staff, approximately 700 volunteers throughout the State and an annual expenditure of about $300,000. Funding comes from private donation, membership, fund-raisers and grants. The increase in the number of seals spending at least a portion of the winter in

New Jersey has also been noted by researchers at Stockton College in Pomona. For the past two winters, they have been monitoring the activities of a growing colony in Great Bay.

The New Jersey Division of Fish, Game & Wildlife's Bureau of Law Enforcement also responds to strandings or other incidents, especially where an animal or the remains of an animal has to be protected from illegal human activities including intentional harm or removal of parts such as turtle shells or cetacean teeth.

The Division's Endangered and Nongame Species Program and Bureau of Marine Fisheries are also involved. The Endangered and Nongame Species Program personnel are primarily involved with the protection of sea turtles through environmental impact assessment reviews and regulatory protection. The Bureau of Marine Fisheries has been involved primarily with activities involving fisheries interactions with marine mammals and sea turtles.

Total funding for all Division activities is approximately $15,000. Funding comes from dedicated license revenues, the income tax check-off program and state appropriations.

Biologists at the Public Service Electric & Gas nuclear generating station at Salem are researching the use of Delaware Bay by sea turtles to address impingement concerns at the plant.

Delaware

The Delaware Division of Fish and Wildlife responds to all strandings of marine mammals and turtles. Live animals are left undisturbed or assisted to deeper waters if they are healthy. If rehabilitation is required, proper arrangements are made, and assistance rendered. This is usually with the National Aquarium in Baltimore or the Marine Mammal Stranding enter in New Jersey.

Dead animals are buried on site or transported to a designated burial area. When possible, necropsies are conducted to determine condition of the animal and cause of death. Stranded animals are examined for indication of human interaction.

Approximately 40 strandings are responded to annually.

The annual expenditure to conduct the protected species stranding program is approximately $10,000. Funding is split between Coastal Zone Management Act grants and state appropriations.

Maryland

The Maryland stranding program is operated through the Department of Natural Resources' cooperative Oxford Laboratory. Laboratory personnel respond to all reported marine mammal and sea turtle strandings. When possible, dead animals are measured, sex determined and

examined for cause of death. Samples are also taken, as appropriate, for toxicology, histology, bacteriology and virology. Toxicology is conducted by the Smithsonian Institute, bacteriology and virology are performed by the Maryland Department of Agriculture, while histological samples are reviewed in-house. Approximately 30-35 strandings are responded to annually.

The Department also assists the National Aquarium in Baltimore with live strandings. Annual expenditures by the Department is approximately $10,000. This represents the partial salary of one staff member funded through a Coastal Zone Management Act grant. Unbudgeted time is also volunteered by other staff members.

The National Aquarium responds to approximately 20 live strandings in Maryland each year. When rehabilitation is required, animals are transported to one of two facilities. One facility is a hospital room with a 98,000 gallon pool at the Baltimore Aquarium, the other is offsite and has a smaller enclosure capable of holding three to four seals and a 1,600 gallon pool for cetaceans. Rehabilitation can include a wide range of activities from recently successful cataract surgery on a seal to a pygmy sperm whale that was successfully rehabilitated and released after an episode involving the ingestion of plastic.

The Aquarium has one full time paid strandings expert, two veterinarians, and two technicians who work part time with protected species and a group of approximately sixty volunteers.

Management of Marine Mammals and Sea Turtles in Virginia

by
Tom Wilcox
Virginia Department of Game and Inland Fisheries

To present an overview of marine mammal and sea turtle management in Virginia, a survey was mailed to state agencies, public/private organizations, and universities requesting: (1) targeted marine species; (2) activities associated with marine mammal and sea turtle management; (3) authority under which the organization operates; and (4) approximate expenditures. Based on information from the survey results, respondents were divided into three tiers depending on the type and degree of involvement in marine mammal and sea turtle management.

Tier I organizations consist of the three state natural resource agencies that are mandated by law to manage marine mammals and sea turtles - Virginia Department of Game and Inland Fisheries (VDGIF), Virginia Marine Resources Commission (VMRC), and Virginia Institute of Marine Science (VIMS). Duties include: VDGIF - implementation of the Virginia Endangered Species Act (§29.563), adoption of the federal and endangered species list (§325.01), and the management of all wildlife and inland fishes (§29.1-109); VMRC - comprehensive management for all marine organisms and habitat (§28.2-101) and prey items (§28.2-100); and VIMS - conservation efforts (§28.1-195) through advising VMRC, conducting research, and providing technical assistance.

Tier II organizations (i.e., those agencies not mandated but involved in management) consist of the Virginia Department of Environmental Quality (VDEQ) and the Virginia Marine Science Museum (VMSM) . The VDEQ oversees the Coastal Resource Management Program of the National Ocean and Atmospheric Administration which funded the development of the Management Plan for Sea Turtles and Marine Mammals in Virginia and other projects related to the Virginia coastal plain physiographic province. In 1989, the VMSM, under a Memorandum of Agreement with VIMS, assumed oversight of the marine mammal stranding network in Virginia. This agreement has enhanced the overall number and quality of response to strandings since most of them occur along the southern coastline and eastern shore of Virginia. Besides its geographic proximity to strandings, the VMSM is also able to provide the proper facilities to maintain live strandings. Presently, the museum responds to cetacean, pinniped, and sirenian strandings, and coastline strandings of sea turtles. The Museum also conducts nearshore research on the abundance and distribution of *Megaptera novaeangliae* and *Tursiops truncatus* in Virginia. The Museum maintains several exhibits pertaining to sea turtles and marine mammals with expansion planned in 1996. Expenses associated with the stranding network and exhibits are $10,000 and $100,000, respectively.

Tier III organizations are primarily involved in research and education and include: James Madison University, National Museum of Natural History, Christopher Newport University,

Virginia Tech, Virginia Bay Team at VIMS, Virginia Living Museum, Resource Education Division - VDGIF, Ocean Encounters, and Center for Marine Conservation. Survey results suggest that several of the above organizations are actively involved in marine mammal and sea turtle research. At the Biology Department of James Madison University, Dr. Ann Pabst, Dr. William A. McLellan, and Susan Barco recently completed a study of *Tursiops truncatus* at Cape Henry, Virginia. The National Museum of Natural History overseas a National Marine Mammal Database and conducts research on cetacean anatomy at costs approximating $145,000. The Resource Education Division at the VDGIF conducts school programs where students construct a lifesize *Megaptera novaeangliae* and learn about physical adaptations. In addition, the Wildlife Information and Enhancement Division of VDGIF is presently developing an on-line computer service with information on all Virginia wildlife, including marine mammals and sea turtles.

From 1993 to May 1995, a committee, consisting of representatives from federal and state agencies, universities, and public/private organizations, began to coordinate the development of a management plan for marine mammals and sea turtles in Virginia. The overall goal of the plan was to direct an interagency coordination to enhance the survival of marine mammals and sea turtles. The plan describes ecological and biological parameters of the four numerically dominant sea turtles (*Caretta caretta, Lepidochelys kempii, Chelonia mydas mydas, Dermochelys coriacea*) and six most commonly observed and stranded marine mammals (*Balaenoptera physalus, Megaptera novaeangliae, Phocoena phocoena, Tursiops truncatus, Phoca vitulina, Trichechus manatus*). The plan also describes regulatory responsibilities of federal and state agencies to facilitate future coordination; a synopsis of existing conservation programs; current public information and education; and a stepdown outline to manage marine mammal and sea turtle populations in Virginia. Future efforts in Virginia will involve reconvening the management plan committee to oversee research and to pursue financial assistance to maintain stranding networks and other related projects.

Participant Q&A and Discussion

MS. SILVA: What database is the stranding information currently in and are all the data compatible?

DR. MUSICK: The sea turtle stranding database for Virginia is maintained at the Virginia Institute of Marine Science (VIMS). We have been the cooperating agency since 1979. The Southeast Center gets all of our data, both raw and summarized. VIMS has been collecting marine mammal data for the NMFS database, which is administered through the Smithsonian since 1979. We did data analysis on that database, which I will talk about it tomorrow. VIMS became more actively involved in 1989 and 1990. They had been part of our stranding network for a couple of years there. They became letterholders as well.

Mark Zirko at VIMS made life a lot easier for us, because most of the marine mammal strandings are on the coast, whereas most of the turtle strandings, except in the fall of the year, are up in the Bay. Because of the geographical location of the two institutions, it makes more sense for VIMS to handle most of the marine mammal strandings, particularly large strandings, since they can reach the animals much faster. We send Mark the mammal data and he sends us the turtle data; we both send data to the National Marine Fisheries Service.

MR. WILCOX: When I was working with John Kineff at VIMS, we received data from him in ASCII format, which we then would load into a powerful database tool like Advanced Revelations. From there we can then bring the data into a geographic information system. In the near future we plan on working with Mark at VIMS to develop a more usable type of database, so he can do cross queries and extract different types of information.

MR. PAYNE: Assuming that the draft plan gets approved at some point, do you know what VMRC's next steps are to address fisheries issues that are actually a very small component of that overall plan, like the pinger experiment you mentioned? .

MR. WILCOX: The pinger experiment was a VMRC proposal and my understanding is that was the first proposal ever received by the Office of Coastal Zone Management from the VMRC.

DR. MUSICK: That proposal was not for management. It was a research proposal. It was kind of funny, because the people at VMRC were very defensive when you mentioned the fact that we were seeing all these harbor porpoises up on the beach and thought they were probably due to the shad intercept fishery or maybe the spiny dogfish fishery, which has exploded in the last couple of years. We said, well, where are the data? We need data. That is another issue. Then all of a sudden this proposal shows up wherein they were trying to scare animals away from nets, without admitting that the nets were catching the animals, to begin with, like putting the

cart before the horse. I do not know if that proposal was funded or not, but it had nothing to do with management. People at VMRC had been receptive and actively participated on the management team who wrote the plan.

As I mentioned previously, what we would like to do, and I believe VMRC would like too, is to apply for a Section 6 from NMFS with VMRC as the principal regulatory agency. They have their own law enforcement officers who are out on the Bay and out in the ocean every day. The people from Game and Inland Fisheries have jurisdiction on the land, as with the Fish and Wildlife Service. The number of nesting turtles in Virginia varies anywhere from two to nine every year.

Protected Species Overview: South Carolina

by
Sally R. Hopkins-Murphy
South Carolina Department of Natural Resources

State Laws

South Carolina Department of Natural Resources (DNR), formerly the Department of Wildlife and Marine Resources, passed the Nongame and Endangered Species Conservation Act in 1976. It affords protection of state listed endangered and threatened species. The penalty for breaking provisions of this act could reach $1,000 or one year in jail or both. The state act is similar to the federal Endangered Species Act (ESA). All federally listed species occurring in South Carolina, appear on the list along with state listed species.

Permits are required by our department to "take" any listed species. Take is authorized only for scientific research and/or education. It should be noted that "incidental take" is not authorized under our state act.

This has been largely ignored with respect to commercial fisheries, but was brought to bear against the U.S. Army Corps of Engineers when a dredging project was begun in Charleston Harbor in August of 1991. The project was stopped at the three-mile state jurisdictional waters and only resumed in December when all sea turtles had left state waters

DNR Programs

Section 6 of the federal ESA provides for funding to the states through Cooperative Agreements. States must show they have an "adequate and active" program for the conservation of endangered and threatened species. Historically these funds have been appropriated and administered by the U.S. Fish and Wildlife Service (USFWS). South Carolina DNR was among the first group of states to sign a Section 6 Cooperative Agreement in 1976 with USFWS. States receive grant-in-aid funding at a ratio of 75 percent federal and 25 percent state match.

Under the ESA, the Department of Commerce, National Marine Fisheries Service (NMFS) has responsibility for 12 threatened or endangered species that may occur in South Carolina waters, six whales, five sea turtles (while they are at sea) and the shortnose sturgeon. However, NMFS received no funding from Congress because no states had signed Cooperative Agreements. And no states would sign because there were no funds available. To short-circuit this "Catch 22", South Carolina DNR signed Section 6 Cooperative Agreement with the NMFS in 1984. We did

this even though there was no money available in hopes of providing the impetus to NMFS and to Congress to appropriate funds.

Although there is still no appropriated money from Congress for NMFS Section 6 funding, in 1992 we began receiving between $40, 000 and $50,000 annually from NMFS program monies. However, using program funds in lieu of real Section 6 funds in inherently unpredictable, subject to changes in NMFS priorities and makes for an unstable program within the state

Species of Concern

There are four species of sea turtles that occur in South Carolina waters: loggerhead, Kemp's ridley, leatherback and green sea turtle. Although hawksbill turtles have stranded in both North Carolina and Georgia, no records have been verified in South Carolina in the past two decades for this species.

Endangered whale species that occur here are: blue, finback, humpback, Northern right, sei and sperm. Approximately 23 species of whales and dolphins have been documented historically in South Carolina.

The only marine endangered fish occurring in South Carolina waters is the shortnose sturgeon.

Activities

Four areas of activity are covered under the DNR program for threatened, endangered and protected marine species. They are: management/technical guidance, monitoring, research and education.

Management/Technical Guidance

Management or technical guidance involves reviewing permit applications for research from the NMFS permit office or development projects, such as dredging or beach nourishment, through the U.S. Army Corps of Engineers. Recommendations are made to mitigate impacts to sea turtles, marine mammals, shortnose sturgeon or their habitats. South Carolina DNR also serves as a clearinghouse for information on TEDs and/or any new or emergency regulations.

Monitoring

Sea Turtle Stranding Network

A volunteer Sea Turtle Stranding and Salvage Network (STSSN) was established in 1980 to determine the temporal and spatial distribution of sea turtle carcasses that strand in South Carolina. South Carolina DNR trains the volunteers in the correct identification of species, methods for measuring carcasses and how to complete the data forms. They are supplied with

data forms field supplies, and permits. In addition, monthly aerial surveys monitor carcasses on beaches which are inaccessible to the volunteers.

A monthly newsletter is sent to volunteers, NMFS and other interested parties. Summaries of weekly stranding totals are faxed to the STSSN National Coordinator as part of the Sea Turtle/Shrimp Fishery Emergency Response Plan.

Marine Mammal Stranding Network

The Marine Mammal Stranding Network was established in 1991 under the authority of the DNR. Prior to this time, there was no organized network and coverage was spotty. Data are sent to the NMFS Regional Coordinator in Orlando and the NMFS Southeast Fisheries Science Center in Miami. Entire carcasses, skulls and/or tissues are provided to the forensics program at the NMFS Charleston Laboratory.

For the past two years, South Carolina DNR and Coastal Carolina University have coordinated a statewide bottlenose dolphin count. These are conducted from New Jersey to Georgia and are intended to be used as an index to the populations of *Tursiops* that are found along the Atlantic coast.

Aerial Surveys for Leatherback Turtles

Beginning in 1989, leatherback turtles began to use nearshore coastal waters during their northward migration. This brought them into contact with the shrimp fishery and resulted in high numbers of stranded animals. To address this problem, NMFS and the affected states wrote a Leatherback Contingency Plan. The plan calls for weekly aerial surveys to document the temporal and spatial distribution of leatherbacks along the southeastern seaboard. Changes in trawling gear or temporary closures would take place if concentrations of leatherbacks reached a certain level. We have conducted these flights over the past three years.

Research

Radio telemetry has been used to determine homing and habitat use of adult female loggerhead turtles. This research is a follow-up to previous studies conducted under USFWS funding.

Genomic and mtDNA is being used to determine the identity of populations of shortnose sturgeon throughout the range of the species. This will also be used to assist law enforcement to identify confiscated products. Mark Collins will have more information on this in the next session.

Education

Printed educational materials are distributed and educational slide presentations are provided to civic groups, conservation organizations and schools. Hatchling loggerhead turtles are provided

to the Riverbanks Zoological Park for display at their facility in Columbia for one year. South Carolina DNR staff has hosted four of the Annual Sea Turtle Symposia and has provided logistical support at five of the others.

Agencies and Organizations

South Carolina DNR is the lead agency for endangered, threatened and protected marine species. We collaborate on many of the activities discussed above with four other entities at the Ft. Johnson Marine Science Center. They are NMFS Charleston Laboratory, the Medical University of South Carolina, the University of Charleston and Sea Grant.

Participant Q&A and Discussion

MR. SIMPSON: I wondered if you had an estimate on the level of take associated with dredging. For example, how many sea turtles would you expect to be taken by a dredging operation of the magnitude Charleston requires?

MS. MURPHY: When the Corps of Engineers first put in for the permit application and asked us to comment on it, it was for a winter dredging project, so the Department offered no objections. They had delays in getting their contracts issued, so when they decided to do it, it was August. They started dredging down in Georgia and took a bunch of sea turtles (approximately 20 animals at Brunswick and 16 at Savannah). When they came up to Charleston, we just said no. They did take two turtles, went into consultation with themselves and decided to up the take level to something like 10. It was at that time that they were going to begin dredging the channel, and our Department had already begun a 16-month study to determine when the turtles were there, at what sea temperatures, and what parts of the channel they utilized. We had that information. So we knew, as they neared that section of the channel where we had documented the turtles, they were going to take turtles and, sure enough, they took two in one day. So they stopped temporarily, upped their take, and that is when they started getting letters from the attorneys.

MR. SIMPSON: How big (in cubic yards) were those two projects where you had 16 and 20 animals taken?

MS. MURPHY: Mike, do you know?

DR. HARRIS: No, I don't. But I would like to add that NMFS performed a Section 7 consultation for all the east coast harbor maintenance and construction, and concluded that they would not dredge in the summer in Georgia.

MS. COOGAN: Dr. Harris is correct. NMFS has now instituted variable seasonal restrictions. Dredging is prohibited in the narrow at all times, where most of the takes occurred and since 1991. Since this has been implemented there have only been 14 takes documented.

MS. BERGER: Sally, I was wondering are the yearlings that you discussed part of a headstart or stocking program?

MS. MURPHY: No, no, no. It is not headstarting, it is not stocking, it is none of those things. In fact, the first year we did a release, the zoo called it headstarting and I said do not ever call it that, again, or they would get no more turtles. It is an educational tool. I am willing to sacrifice 10 hatchlings per year to the zoo for education.

MS. BERGER: And also, educational takes can occur only for threatened species and those are loggerheads?

MS. MURPHY: Right.

Management of Protected Marine Species in Georgia

by
Michael J. Harris
Georgia Department of Natural Resources

Georgia's coast occupies the western-most portion of the South Atlantic Bight, an area partly sheltered from wave action. Consequently, the coastal marine environment is current dominated rather than wave dominated. Average tidal range is about seven feet with spring tidal ranges of up to nine feet. Georgia's coast consists of a series of barrier islands separated from the mainland by an extensive tidal marsh. Only four of Georgia's barrier islands -- Tybee, St. Simons, Sea Island, and Jekyll -- are accessible by automobile and support commercial development. The remaining barriers are protected from development through ownership by State and Federal Resource Agencies or private conservation organizations. Georgia's beaches provide nesting habitat for loggerhead sea turtles. The extensive estuaries and coastal waters provide habitat for juvenile and sub-adult loggerhead and Kemp's ridley turtles. Leatherback sea turtles regularly migrate through Georgia's coastal waters in the spring but green turtles and hawksbill turtles are less common in Georgia's waters. Manatees occur throughout Georgia's estuaries from spring through fall and few animals over-winter at two industrial warm-water outfalls. Georgia's nearshore coastal waters comprise part of the calving grounds for the northern right whale.

Management responsibility for sea turtles and marine mammals in Georgia is located within the Nongame/Endangered Wildlife Program, Wildlife Resources Division of the Department of Natural Resources (DNR). Other Divisions within DNR include Program Support, Environmental Protection, Coastal Resources, Historic Preservation, Parks Recreation and Historic Sites, and Pollution Prevention Assistance. Having all State Agencies (Wildlife Resources, Coastal Resources and Environmental Protection Divisions) that are responsible for issues that may impact protected marine resources within a single agency aids in coordination.

Legislative authority for conservation of wildlife in Georgia, including marine turtles and mammals, is found in Title 27 of the Official Code of Georgia. This title, known as the Game and Fish Code, establishes ownership and custody of wildlife in Georgia, sets forth the powers and duties of the Board of Natural Resources and the Department of Natural Resources, specifies times, seasons and methods for taking wildlife, and provides other regulations. The Endangered Wildlife Act of 1973 (O.C.G.A. 27-3-130 to 27-3-133) provided authority to the Board of Natural Resources to identify any animal species which it determines may be rare, unusual, or in danger of extinction and to designate such species as protected. The Board also may issue rules and regulations to protect listed species. The Nongame Wildlife Conservation and Wildlife Habitat Acquisition Program, established in 1985 (O.C.G.A. 12-3-600 to 12-3-602), seeks to promote conservation, wildlife habitat acquisition, and education to enhance the protection of nongame wildlife and to promote non-consumptive use of nongame wildlife by the people of

Georgia. This legislation created the "Nongame Wildlife Conservation and Wildlife Habitat Acquisition Fund" consisting of monies donated through an income tax checkoff as well as direct donations.

Georgia DNR has pursued cooperative ventures to assist in the management and conservation of wildlife including marine species. In 1977, Georgia entered into a Cooperative Agreement with the U.S. Fish and Wildlife Service (USFWS) under Section 6 of the Endangered Species Act of 1973. Georgia has continued to receive matching funds for conservation of endangered and threatened wildlife through this agreement. In 1989, Georgia became the second state, after South Carolina, to enter a Section 6 Cooperative Agreement with the National Marine Fisheries Service (NMFS) under the Endangered Species Act. Georgia also has established Cooperative Law Enforcement Agreements with USFWS and NMFS.

Georgia's protected marine wildlife, under the state's Endangered Wildlife Act of 1973 include northern right whale (E), humpback whale (E), West Indian manatee (E), loggerhead sea turtle (T), green sea turtle (T), leatherback sea turtle (E), Kemp's ridley sea turtle (E), hawksbill sea turtle (E), and the shortnose sturgeon (E). Conservation programs for protected marine species in Georgia have focused on those activities that have been given high priority in species Recovery Plans.

Conservation of the West Indian manatee in Georgia includes the carcass recovery and salvage network, public sighting database, radio/satellite telemetry, public education and awareness and technical assistance. The recovery and salvage of manatee carcasses provides information on the location, causes, and level of mortality in this species. Georgia coordinates closely with Florida Department of Environmental Protection (DEP) on the manatee carcass recovery program and most carcasses from Georgia are examined by biologists from Florida DEP. Since 1988, Georgia has maintained a toll-free number for reporting sightings of manatees and has encouraged reporting by printing and distributing signs throughout coastal Georgia. Opportunistic sightings obtained from the public have been useful in identifying habitats used by manatees in Georgia and the timing of manatee occurrence in these habitats. However, such information can be biased because no information is available on the effort expended searching for manatees, or on the reporting rates for manatee sightings.

In 1994, the Nongame/Endangered Wildlife Program began a radio and satellite telemetry study, in cooperation with Save the Manatee Club, the Sirenia Project of the National Biological Service, and USFWS. Data obtained from this study will be used in developing a long-term management plan for protection of the manatee in Georgia. Efforts to increase boater awareness of manatees are on-going and serve as the primary method to protect manatees from vessel collisions. Technical assistance is provided to the USFWS, Corps of Engineers, Georgia Department of Transportation, and other agencies involved in carrying out or permitting development activities on the coast.

The coastal waters of Georgia and northeast Florida provide the only calving grounds for the northern right whale, the most endangered of all the large whales. Conservation of the northern right whale has concentrated on protecting whales from collisions with large vessels, the primary cause of human related death in this species. The Nongame Program has been heavily involved with the Southeastern Implementation Team for the Recovery of the Northern Right Whale through organization and hosting of team meetings and distribution of minutes. The primary focus of the team has been in conducting a series of daily aerial surveys of the whale's core calving grounds to locate right whales. This information is then provided to military and commercial harbor pilots at ports within the calving grounds. Our role has been to organize and conduct training sessions for pilots prior to the calving season and to develop and produce brochures, placards, and other educational materials for use by the pilots and others who navigate large vessels through these waters. In cooperation with Florida DEP and the New England Aquarium, Georgia's Nongame Program flies synoptic aerial surveys of the calving grounds to monitor annual calf production by the right whale. In addition, public education and awareness programs are conducted and technical assistance is provided to agencies evaluating permits for development activities in the right whale's calving grounds.

Georgia's DNR Nongame Endangered Wildlife Program coordinates the sea turtle stranding and salvage network in Georgia. Beaches are systematically surveyed for stranded turtles and data are collected in accordance with the STSSN protocol and provided to the NMFS National Stranding Coordinator. Figure 1 illustrates the level of sea turtle strandings in Georgia from 1979 to 1994.. Stranding data have been very important in identifying the interaction between sea turtles and the shrimp fishery and mortality associated with hopper dredging of the Harbor entrance channels (Figure 2). The nongame program also coordinates the index beach nest survey program in Georgia to monitor numbers of loggerhead sea turtle nests as an index to the population of adult females (Figure 3). Nest protection programs also are conducted on state-owned barrier islands where predation has resulted in high losses of eggs. Feral hog control is probably the most important component of these projects and the removal of several thousand hogs from Ossabaw Island was followed by greatly increased nesting success.

In response to high strandings of leatherback sea turtles in 1991 and 1992, Georgia DNR, South Carolina DNR, Florida DEP and the NMFS have cooperated in development of a contingency plan to reduce leatherback sea turtle mortality in shrimp trawls. Each state is responsible for flying aerial surveys to locate concentrations of leatherback turtles during the spring (March-May) when these animals appear to be migrating through southeastern coastal waters. NMFS implemented the plan through a rule which requires special turtle excluder devices (TEDs) with larger escape holes when leatherbacks are abundant. These surveys have been flown each year since 1993.

A major focus of Georgia's program has been implementation of the TED regulations. Data obtained through the stranding network have been used to monitor TED effectiveness and the number and location of strandings are provided to State and Federal Law Enforcement Agencies

Figure 1. Sea Turtle Strandings in Georgia, 1979 - 1994.

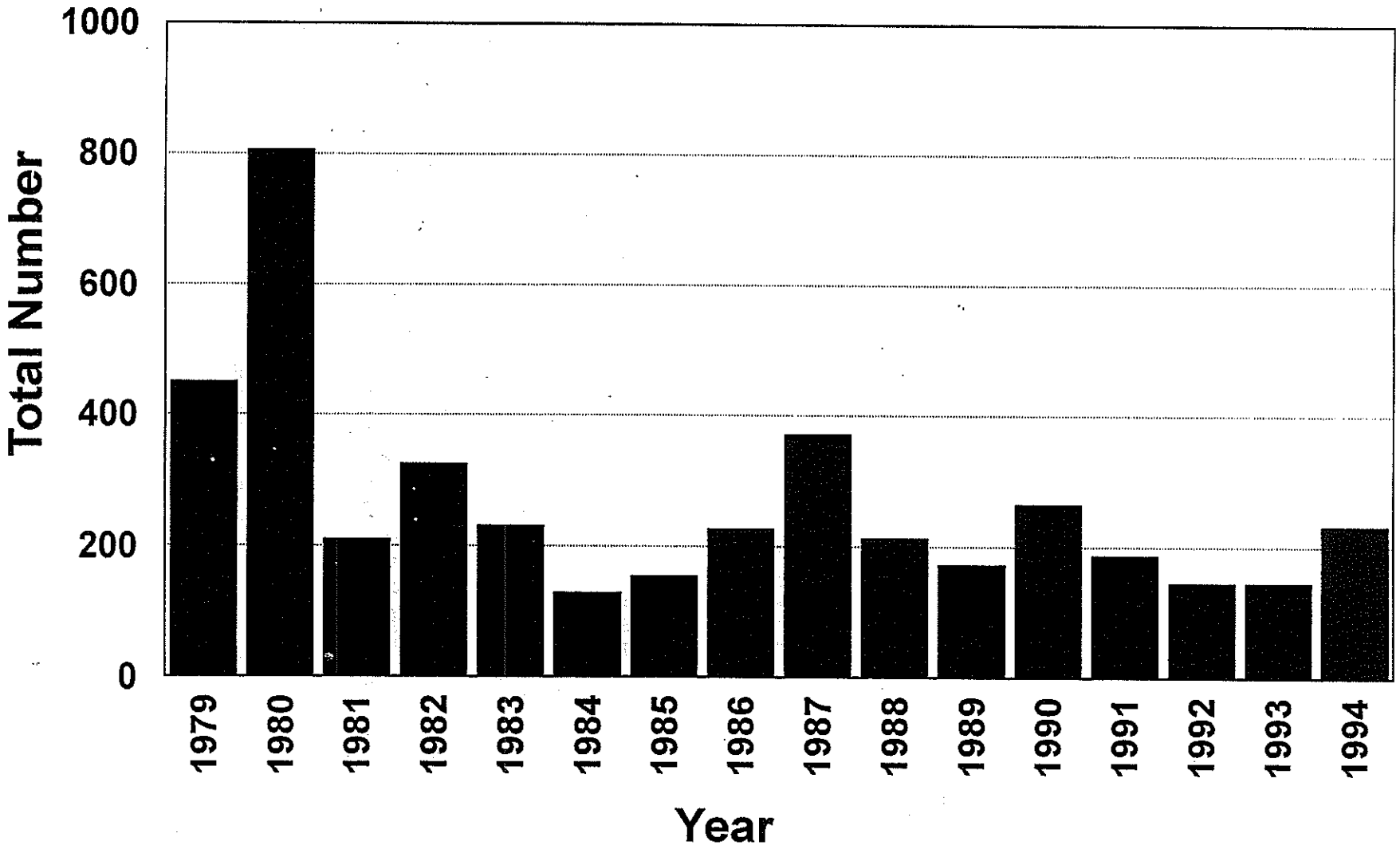
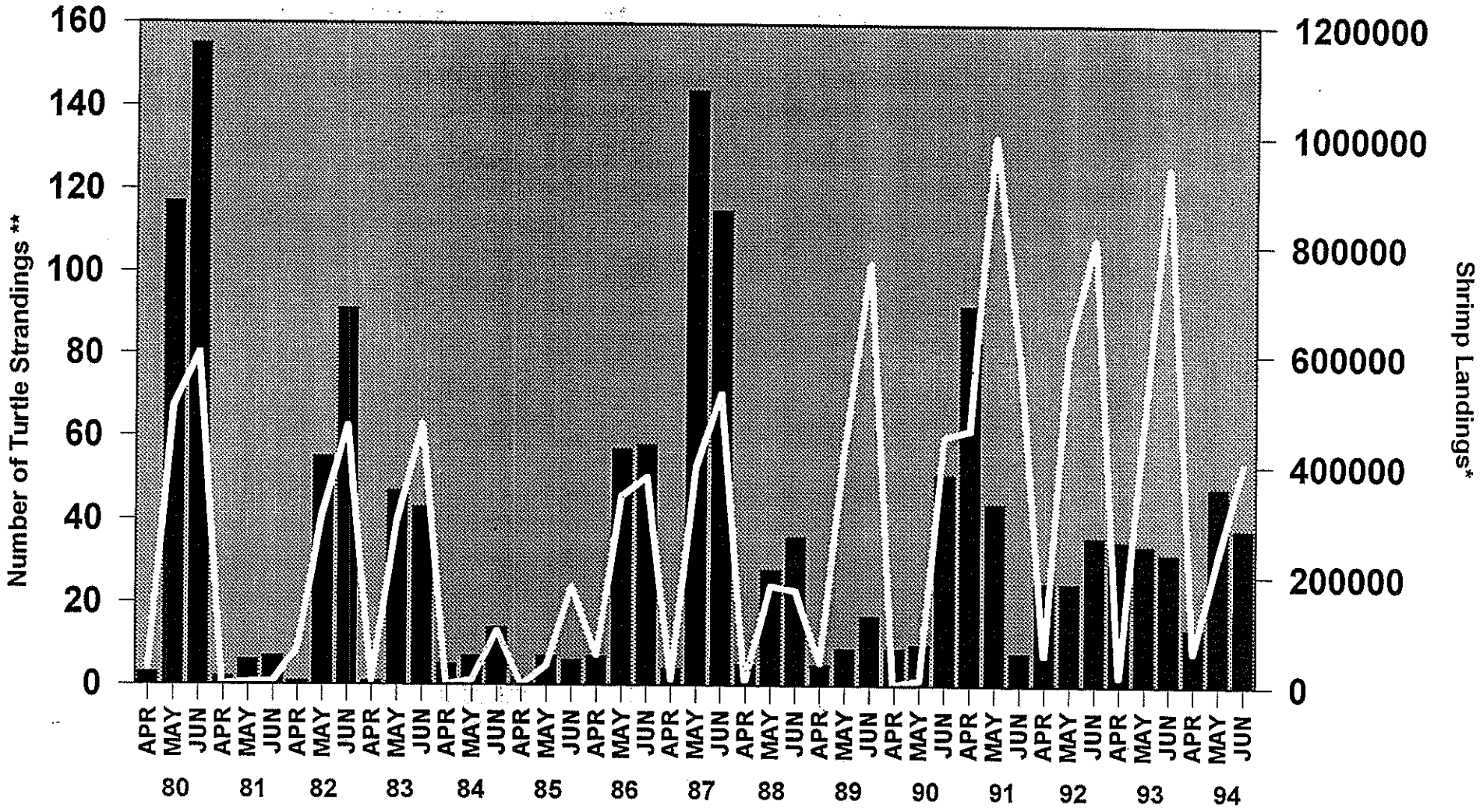


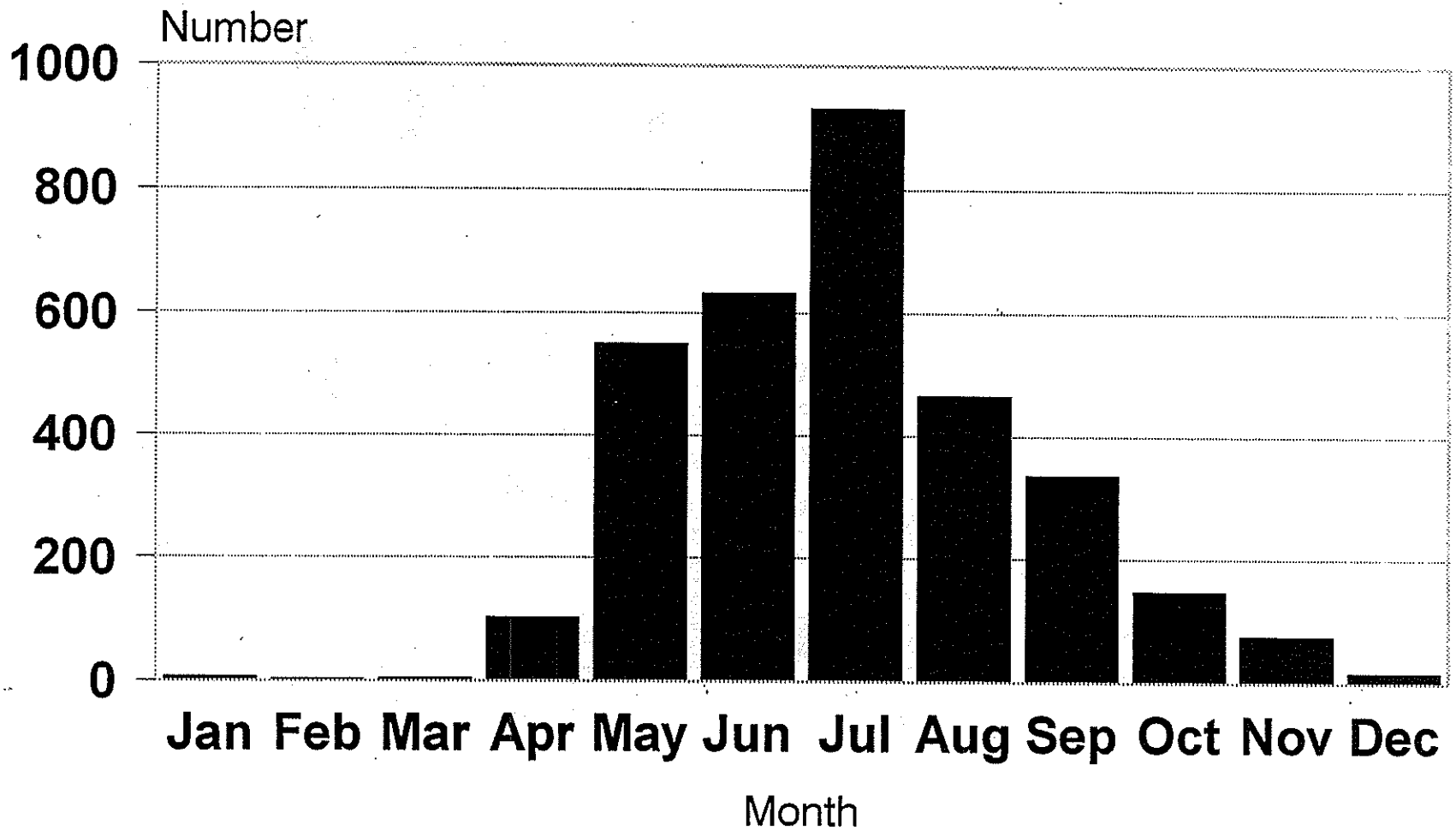
Figure 2. Turtle Strandings Compared to Shrimp Landings in Georgia, 1980 - 1994.



* Brown and White Roe Shrimp In Pounds; represented by line.

** Number of turtles stranding by month, all species; represented by bar.

Figure 3. Loggerhead Strandings in Georgia, 1980 - 1994.



so the TED enforcement details could be focussed where problems were most likely to be occurring. Training sessions for DNR Law Enforcement Agents have been coordinated and conducted to keep them up to date on Federal TED rules. During the 1995 season, Georgia has participated in implementation of the NMFS Emergency Response Plan to address sea turtle mortality resulting from the shrimp fishery. Weekly reports of strandings are provided to the NMFS for comparison with indicated take levels. Considerable time and effort was expended answering calls and complaints from fishermen when the take levels were exceeded and Emergency Rules placing greater restrictions on shrimp fishermen were implemented.

Public education and awareness and technical assistance are also important components of sea turtle conservation in Georgia. Activities include production and distribution of educational materials, presentation of talks and programs, and providing information to the media. Technical assistance includes review and evaluation of development proposals including harbor dredging, beach nourishment, beach stabilization, and other projects. State and federal scientific permits for work on turtles in Georgia are reviewed and conditions are implemented to protect turtles.

Georgia DNR's Nongame/ Endangered Wildlife program coordinates the Marine Mammal Stranding Network for Georgia. This includes maintaining and training network members, reviewing and proofing all stranding forms for Georgia and providing initial response for many of the mammal strandings on Georgia's coast.

The Management of Protected Species in Florida*

by
Barabara Schroeder
Florida Department of Environmental Protection

I have three text slides that I will use to go through, first, an overview of the way our agency is organized and how the responsibilities are divided up for marine protected species in the state of Florida. Second, I will go over the legal accommodation for marine protected species in the state and then just talk a little bit about some recent developments that are going to have some impacts on protection of marine species in Florida, especially what we are here to talk about this week.

In Florida it is the Department of Environmental Protection (DEP). Previously, most of what I am going to talk about today fell under the Department of Natural Resources (DNR), but about a year to a year and a half ago DNR merged with the Department of Environmental Regulation within the state and became a sort of mega-agency, now known as the Department of Environmental Protection.

There are a lot of divisions under DEP now. The one that we are primarily concerned with in terms of marine protected species is the Division of Marine Resources. Under the Division of Marine Resources there are a number of bureaus and offices. The two that have primary responsibility for marine protected species are the Florida Marine Research Institute and the Bureau of Protected Species Management.

Obviously, one is concerned primarily with research on all marine organisms but, in our case, talking here today about marine protected species. The Bureau of Protected Species Management has primary responsibility for management issues, but there is obviously a lot of exchange and cooperation and overlap between the two in trying to effect recovery of listed species.

In Florida we have five species of marine turtles: the loggerhead, green, leatherback, Kemp's ridley, and hawksbill (year-round presence for all of those). We have a number of marine mammals protected under either the Endangered Species Act (ESA) or the Marine Mammal Protection Act (MMPA), primarily bottlenose dolphins, the right whale, and Florida manatee, and short-nose sturgeon as well.

* text edited from verbatim transcripts

I work in the turtle program, so you will find that my presentation is probably geared most heavily on turtles. I have been in contact with our manatee folks and marine mammal issues and so hopefully will be able to shed a little light on activities that the state conducts with them as well.

Just to go outside of the vision of marine resources for a minute, the Florida Marine Patrol, which is in the Division of Law Enforcement, provides, obviously, enforcement support for marine protected species. They also provide a degree of support to the stranding networks. They have an 800 number through which a lot of our stranded animals are reported and, in turn, farmed out from Marine Patrol to folks in the Marine Research Institute, primarily for manatees or marine turtles.

Outside of the state the Coast Guard does provide stranding support to us in bringing animals in, on occasion, when they come across them or are made aware of them, if they have a vessel in the area. The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) also provide enforcement support in the state on our nesting beaches, primarily USFWS, and, in the marine environment, the NMFS. We also get assistance to the stranding networks from local enforcement agencies like country marine police units or local marine police units as well.

Going back into the Division of Marine Resources, within the Marine Research Institute the main laboratory is located in Saint Petersburg and there are a number of field stations located around the state. For turtles a lot of what Sally and Mike have already said holds true for the Florida program as well. We are involved in both research and monitoring efforts that are long-term in nature.

Our research falls basically into four broad categories. We are conducting work on the distribution of abundance and population status of both nesting populations and in-water. Most of the focus on marine turtles over the past 20 to 30 years has been on nesting populations, primarily because that is where they are the most readily accessible. It is a lot more difficult to get information on animals in the water, but it is an equally important component of learning about these animals.

A lot of the work has been spreading out in that direction, and our program is quite similar. We coordinate statewide nesting surveys on almost all of the nesting beaches throughout the state and also have an index nesting beach survey program, which is a standardized survey effort to look at long-term population status of our nesting animals.

We have loggerhead nesting, green turtle nesting, and leatherback nesting in the state. For loggerheads, the whole southeast and, for those of you who do not know, is the most important nesting aggregation in the western hemisphere and second in the world. So between South Carolina, Georgia and Florida we have some very important habitat to protect.

We are looking at habitat requirements for both nesting populations and for turtles in the marine environment, working to try to protect our nesting beaches in terms of coastal development and construction activities, and I will talk a little bit more about that on the protected species management side.

We run the stranding and salvage network for marine turtles in the Institute to monitor mortality, the distribution of it, to identify threats. We permit rehabilitation facilities around the state to help with animals that come in alive. We average throughout the state, Atlantic and Gulf, about 600 to 800 marine turtle strandings a year. That is down from our high of about 1200 in the pre-turtle excluder device (TED) years. So it is a lot of animals we are dealing with on an annual basis.

We are looking at life history and ecology, migratory movements of adults, immature animals, and hatchlings within the Institute. We also have a permitting system through which we permit other research and monitoring activities throughout the state. In the water we are primarily working in the Institute in Tampa Bay and Florida Bay looking at a lot of different life history parameters.

For turtles, on the management side, because a permit is required in the state to work with marine turtles in any capacity and because we have a Section 6 cooperative agreement with the USFWS we issue all permits in the state to do anything with turtles, and we manage about a hundred of those permits around the state. Most of those are issued for nesting beach surveys and for participation in the stranding and salvage network.

For turtles we do not have a large staff. We have a very big coastline and we cannot be everywhere, so we have a series of permit-holders that are trained, many are affiliated with universities or private conservation or research foundations, and some that are just local conservation groups that have an interest in marine turtles.

The Bureau of Protected Species management reviews applications for coastal construction permits that affect nesting beaches and also for activities in the water, such as dredging, disposal of dredge material, renourishment projects, the in-water effects, those sorts of things, for their effects on marine turtles, and may put timing restrictions -- some of the things Mike and Sally have already talked about. Very similar things are going on in the state, so I will not go on too much about that.

The turtle program is funded primarily through the Nongame Wildlife Program of the state. We did receive state funding for the first year that the program was in place, but we have not been able to have that since then; so the nongame program, which comes under the Game and Fresh Water Commission, has been funding our program. We get some funding from USFWS through our Section 6 cooperative agreement and we bring in some outside grant funding.

Our total program for marine turtles is about $400,000 a year. We have six full-time career service employees and four temporary employees in the program, and those are split between the east coast and the west coast in Tallahassee, where most of the staff for the Bureau of Protected Species Management reside.

The other big protected species program in the state is the manatee program. Again, they also fall under research in the Institute and the management activities on the other side. Virtually all of the manatee work is done in-house. It is a very large program, a well-funded program. It has been in place for substantially longer than the turtle program has. We tried to model some of the things we are doing with turtles after what the manatee program has successfully done. They are conducting a lot of work on population status and size, distribution. They are doing a lot of satellite telemetry work with animals, looking at short- and long-term movements. They have a very large and active stranding and salvage program.

The number of animals that they are dealing with is much fewer than we deal with in the turtle program, but they are able to gather a lot more information from each carcass that comes in, about 150 animals per year in recent years. We have a state-of-the-art pathobiology lab in Saint Petersburg that is staffed and funded. All manatee carcasses that are not in very poor shape are thoroughly necropsied at the path lab, and Georgia's animals come down there as well. There is also an active rehabilitation program for manatees that come in alive. There are several permitted rehabilitation centers around the state that take in manatees.

On the management side, very similar things that are done for turtles, permit applications for activities that may affect manatees are reviewed, perhaps modified so that they are less impactive or, in some cases, denied. Speed zones have been set up in many places around the state to protect winter aggregation areas or corridors of regular transit and migrations for these animals.

The manatee program also has a very active geographic information system program for these animals, incorporating their telemetry work, aerial survey work, their carcass recoveries, et cetera. We are trying to tap into some of that for turtles as well, so that we can provide information on turtle distribution and abundance in a more readable or accessible fashion to the public and to other agencies that need that kind of information.

For non-manatee marine mammals, the state does not have a big program compared to manatees and marine turtles. We do participate in the marine mammal stranding network and provide information to the southeast coordinator at Sea World in Orlando and also to the Southeast Fisheries Center, NMFS, and we are involved in right whale work along the northeast coast of Florida. All of the things that Mike was just talking about for Georgia, Florida is doing as well, in cooperation with NMFS and the state of Georgia.

The manatee program, as I said, is quite well funded. It is about a $2.4 million program a year. Most of their funding comes through the sale of specialty license plates for the manatee. That

has been very successful. We have been trying to get a license plate for turtles and just barely failed to do that during this past legislative session, but we are hopeful that we may be able to resurrect that, again, next year. There are also boat stickers that are sold for both manatees and turtles. I am not sure how much the manatee one generates, but the turtles generate about $30,000 a year. The department gets some funding for right whale research through our USFWS Section 6 agreement. It comes from NMFS to USFWS and then they pass it to us, because we do not have a Section 6 agreement yet with NMFS.

The Section 6 agreements really relieve a lot of the burden on NMFS. They are helpful, because they offer a mechanism for funding or to pass funding, even if it is not appropriated Section 6 monies, but in terms of permitting activities within the state, it really relieves a lot of the burden on the federal agency for doing that. If USFWS had to permit all the folks that are doing things with turtles in Florida, it would be a major task for them, and they do not have to do anything but monitor our program and receive a lot of information back because of it.

On the other side here is the Florida Marine Fisheries Commission. They have sole authority for fisheries gear regulation in the state. If it is a fisheries interaction problem, the Department itself cannot make a rule, or the Division cannot make a rule, that would solve a problem or attempt to address a problem. We have to go to the Commission and they take up the issue under their authorities. They have principally interacted with us on two turtle issues, one being TEDs in the shrimp trawl fishery and the other a gillnet issue on the central east coast of Florida.

Also, I have to say something about the fisheries folks in the Institute. We do interact with them in terms of protected species to get information on fishery effort data, to know what kinds of fisheries are operating at certain times of the year and certain places where we may be having stranding problems. They help us with analyzing our stranding data versus fishery effort data, and we have also worked with them on at least one observer program for a gillnet fishery on the east coast.

These are the primary legal accommodations for marine protected species in the state. I am just going to go through these and tell you a little bit about -- just give you a very brief overview of what they say or what they do for marine protected species in the state, the first being the Florida Endangered and Threatened Species Act of 1977. Basically, it just establishes the conservation and wise management of endangered and threatened species to be the policy of the state of Florida.

It confers the responsibility for upland and fresh water species to the Game and Fresh Water Fish Commission and the responsibility for marine endangered and threatened species to DEP. There are no penalties specifically there or prohibitions. Those come under the next one listed, the Endangered and Threatened Species Protection Act.

It prohibits intentional killing or wounding of any species designated as either endangered or threatened or a species of special concern, which is strictly a state listing, and it provides for penalties for those acts. Each one of these has from a small number to a large number of rules that may have been promulgated under them that address specific things. The list of species is designated in rule and that also adopts the federal listings as well.

The next three all fall under Chapter 370 of Florida statutes. They deal with certain marine animals in four parts. The first is the Marine Turtle Protection Act, which defines and prohibits take, a very broad definition of take, including alteration of habitat that significantly impairs breeding or essential behaviors of the animals, established career service positions within the marine turtle program, provides for penalties. (Unfortunately, it does not provide for funding and we have been struggling with our funding every year for the turtle program.).

The second part of Chapter 370 is the Florida Manatee Sanctuary Act. Again, it prohibits take in the broad definition under the ESA. It confers joint law enforcement responsibility to DEP and the Game and Fish Commission for carrying out the provisions of the Act. It provides for penalties, provides for rule adoption of speed zones and other conservation measures.

The third and fourth provisions of Chapter 370 deal with no taking -- and permit provisions -- of dolphins and manta rays.

Then we have the Marine Corals and Sea Fans Protection Act, which prohibits the taking or selling of certain sea fan species and all hard, stony, or fire corals. It provides for penalties for such.

Then the establishment of the Marine Fisheries Commission, which I mentioned before. Again, how they interact on marine protected species issue is that they have the sole authority for gear regulation. I should mention that that authority was challenged over the TED issue and made its way to the state supreme court and was upheld in, I believe, 1990.

The other significant action that occurred last November was the Florida constitutional amendment limiting marine net fishing. This is basically what the amendment says -- it was passed by the voters of the state of Florida in November and took effect on July 1 of this year: "For the purposes of catching or taking any saltwater fin fish, shellfish, or other marine animals in Florida waters, no gillnets or other entangling nets shall be used in any Florida waters and no other type of net containing more than 500 square feet of mesh area shall be used in near-shore and in-shore Florida waters."

On the Atlantic coast, which is what we are concerned about, that is out to one nautical mile. This affects shrimp trawlers, primarily, on the east coast. There is some controversy now about what that 500 square foot of mesh area means. I spoke with the Marine Fisheries Commission folks last week and they have scheduled -- the issue is now in the courts and there are oral

arguments scheduled on the issue for the end of August. So that has yet to be resolved. But it will result, on the Atlantic side, in a reduction in the amount of near-shore fishing for shrimp.

I will talk a little bit more about gillnet problems and how this may help with protected species issues tomorrow when we are getting more into the specifics of it. This was driven primarily, for those of you who are not familiar with it, by the recreational fishing community because of the decrease in abundance of sport fish stocks. Turtles, manatees, and marine mammals were used for getting public support. There are some serious gillnet issues with turtles that will likely be resolved with this ban, but it was driven primarily by the recreational fishing community.

Participant Q&A and Discussion

MR. PAYNE: I have a question for Stu Kennedy. Does the Florida Marine Fisheries Commission have any interaction with the Atlantic States Marine Fisheries Commission?

MR. KENNEDY: Actually, our Division is the representative on the Atlantic States Marine Fisheries Commission, our Division director. The Florida Marine Fisheries Commission, its staff are the representatives on the South Atlantic and Gulf Fishery Management Councils. So it is shared responsibility and a lot of communication, a lot of paper passes hands, but that is how we have broken it up.

MR. HALGREN: Are there any other questions for any of the state program members?

MR. STREET: Yes. Since North Carolina was not covered, I would like to provide you with a quick overview of the state's marine mammal programs.

The primary responsibility for protected species in North Carolina lies with the Wildlife Resources Commission. The Division of Marine Fisheries, which I am with, is a separate agency. The Wildlife Resources Commission is an independent agency under the constitution. The Division of Marine Fisheries is part of the Department of Environment, Health, and Natural Resources and has no directed program relative to protected species. The Division of Marine Fisheries does things with them as it can. For example, its enforcement officers respond to and report strandings. The Division of Marine Fisheries works with the Wildlife Commission, which has a person designated as a sea turtle coordinator. In addition, the Division of Marine Fisheries works with Sheryan and her folks somewhat.

North Carolina's Marine Fisheries Commission has very, very wide, regulatory authority over gear, seasons, et cetera. It has enacted special rules relative to protected species, such as that enacted for shortnose sturgeon in the Cape Fear River in the late 1980s.

The sea turtle stranding network in North Carolina is, as I said, coordinated by the Wildlife Resources Commission. It is an extensive network, a combination of private citizens, groups, the Baldhead Conservancies, such as down at Baldhead Island and Cape Fear, a group on Topsill Island, just below New River. There are two very large federal seashores in North Carolina, Cape Hatteras Seashore and Cape Lookout National Seashore, which together occupy well over one-third of the coast of North Carolina. They do stranding surveys. Camp Lejeune Marine Corps Base has about 14 or 15 miles of ocean beach. They have an active nesting protection program on base. Only one or two manatees a year show up in North Carolina. All funding goes to the Wildlife Resources Commission.

North Carolina also has what is called proclamation authority. This is where our Marine Fisheries Commission, which is our rule-making body, can delegate to the director of the Division

of Marine Fisheries the authority to "close or restrict by proclamation any coastal waters with respect to taking or attempting to take any or all kinds of marine resources when the method (equipment) used is a serious threat to an endangered or threatened species listed pursuant to U.S. Code 1533(c)." This proclamation has only been used once and that was the Hatteras Bight turtle stranding just before Christmas in December, 1990.

North Carolina also has regulations for a sea turtle sanctuary along about 15 miles of beach, just north of Camp Lejeune Marine Base. There is also the only non-TED area, about two by 20 miles in area, off the coast where the shrimp fishery operates by a strategy of catching large volumes of algae on the bottom, bring it on deck, dump it, and sort the shrimp out. TEDs absolutely do not work in this area, because they become clogged. Tows are limited to 15 to 20 minutes; because of the volume of the material. So far it seems to be working. There are about 15 to 20 boats involved in the fishery. I guess, in a nutshell, that is protected species in North Carolina.

PARTICIPANT: The sanctuary you mentioned, what does that entail?

MR. STREET: It is an area along the beach south of Morehead from Boge Inlet down to New River, so it is about 25 or 30 miles of coast out to three miles, which is closed during the nesting season. It is closed to trawling and any commercial equipment from June 1 through August 31, except that the director, by proclamation, may modify the sanctuary, including dates and areas and restrictions.

MR. HALGREN: Thanks, Mike.

The Atlantic States Marine Fisheries Commission's Policy on Protected Species Management

by
George Lapointe
Director, Interstate Fisheries Management Program
Atlantic States Marine Fisheries Commission

The title of my talk is listed as Atlantic States Marine Fisheries Commission Policy on Protected Species Management. Well, here it is. (Shows a blank sheet of paper) But you are here to develop it. I would like to do a couple of things. One is to talk a bit about the Commission, because I think some of you do not know too much about it. I rooted through the Interstate Fisheries Management Program (ISFMP) Charter, which contains the standards and procedures for fishery management plans, and I will go through the language that will help tomorrow's and Wednesday's discussions on developing some policies or procedures for the Commission to deal with protected species issues.

In dealing with these protected species issue, you will find the states and the Commission are kind of schizophrenic in handling the issue. They want to handle the issue head on because they recognize they have to and, on the other hand, when Mr. Hyde or Dr. Jekyll, whoever, comes out, they want to avoid it because of all the "baggage" that it implies.

I am going to mention two kind of war stories to explain, not justify, the schizophrenia. The first one is something I just read, that the director in Massachusetts, Phil Coates, is being sued, along with a number of other people, by a marine mammal protection advocate over the fisheries' interactions with right whales in New England, and the lack of action on the part of the state in handling those issues. So it makes the directors and agency people a little leery in handling the issues.

The other one comes from my adopted state, Louisiana. It was from a couple of years ago when I worked in the state wildlife and fisheries building there. They got a call from the law enforcement people, who had had a call from a shrimper, and apparently the Coast Guard was out near the Chandeloor Islands, a really neat barrier island chain about 20 miles offshore at the mouth of the Mississippi River, and they were dropping some packages into the water and then they were retrieving those, just doing what the Coast Guard does. A local shrimper called up law enforcement people to tell them to tell the Coast Guard to quit dropping sea turtles in front of the shrimp trawlers.

Commission Overview

The sections of the Commission that would be of interest to folks here are, obviously, the Interstate Fisheries Management Program, which quite a few folks are familiar with, Tina Berger works on protected species and outreach for the Commission, Dianne Stephan works on habitat concerns, and Lisa Kline heads up our research and statistics section.

The ISFMP was formed out of our state and federal fisheries management program in 1981 to put together interstate fisheries management plans to coordinate among the states for obvious reasons. We have, currently, 17 plans and, I think, one more on the way for tautog.

Our fishery management plans (FMPs) in the past were advisory, so people did not give us a lot of attention, but two pieces of federal legislation have changed that. First was the Atlantic Striped Bass Conservation Act, passed in 1984, which said, in essence, that if the Commission writes a plan, the states have to follow that plan or be found out of compliance with the Atlantic Striped Bass Conservation Act, in this case. If they are out of compliance, a moratorium is put on the fishery in the state that is out of compliance.

The Atlantic Coastal Fisheries Cooperative Management Act, passed in 1993, does the same thing with all of our fishery management plans. Now when we write plans, they contain compliance criteria by which the states are judged every year. For those states out of compliance with provisions in fishery management plans a moratorium can be placed by the secretary of commerce on those fisheries.

I think that is it in a nutshell. I will include the ISFMP Charter, because it contains some information on how the program works and the contents and the standards and procedures by which fishery management plans are developed.

Protected Species Considerations

I looked through two documents to prepare for today's discussion. One is the Commission's Compact, which was started back in 1942, when the Commission started, and then the ISFMP Charter, which was just recently approved for information on protected species. Our Charter, not surprisingly, has no references and the ISFMP has no direct mention of protected species, except in the definition of bycatch in the back of the book.

First, I will mention the makeup of the ISFMP Policy Board, which deals with approving fishery management plans and giving direction to those of us involved in developing fishery management plans. It includes the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. Those folks have traditionally just gotten us involved with fishery management issues, but I think that would be one way for the federal services to make their views on protected species known under current operating procedures. Again, the charter has some language that I think is

pertinent. One is the definition of bycatch, "That portion of a catch taken in addition to the targeted species because of nonselectivity of gear to either species or size differences; may include nondirected, threatened or endangered and protected species." Try as I might, I could not find the reference to that definition of bycatch in the charter, and I suspect that is due to my rushing through the charter and not the fact that the folks wanted it put in there. The definition alone, however, suggests that the Commission and the people putting the charter together recognized the importance and the relevance of protected species issues and the need to deal with those.

The Charter also contains other language, I think, which will help guide all of our thoughts on protected species. In the section on standards and procedures, which Mike Payne mentioned earlier, it says: "The Atlantic States Marine Fisheries Commission recognizes that an effective fishery management program must be carefully designed in order to fully reflect the varying values and other considerations that are important to the various interest groups involved in coastal fisheries. Social and economic impacts and benefits must be taken into account."

In the contents of a FMP there is a section on supporting information and analyses, and one of those is "a review and status of fish habitat important to the stocks and ecosystem considerations and a review of the social and economic characterizations of the fisheries." I think this provides some guidance to folks in the next couple of days to developing some means for the Commission to handle protected species issues.

I would like to give a couple of suggestions on how I think it should proceed, because I am not going to be here tomorrow. I think you will find the ISFMP a flexible process and it is flexible enough to handle most issues that affect fisheries or that are affected by fisheries. In proceeding, I would like to repeat the words Lew Flagg used earlier today, "to develop thoughtful, sound recommendations for approval and use by the Commission in handling protected species issues."

I have three alternatives here. The first option is to do nothing, a no-action alternative, which we have clearly heard today is not a viable alternative but remains an option. The second option that Tina and I talked about was writing a Commission protected species management plan, a separate plan for handling protected species issues. The third approach is to incorporate protected species concerns into each fishery management plan. I like the last approach the best.

A draft protected species outline could be developed that could be used by Commission staff, our plan development teams, our technical committees, the species management boards, and our ISFMP Policy Board, to give guidance without overwhelming an already burdened fisheries management process. Using this approach I believe that the protected species concerns should be included in each FMP as the FMPs are either implemented or amended. Similar to our Habitat Committee which put together a draft habitat section for FMPs, which we are now incorporating into FMPs as they are implemented or developed.

I don't know how concerns like the impacts of fisheries on bottlenose dolphins in the mid-Atlantic would be handled, given that there is probably a number of fisheries that impact that protected species issue.

I think as we implement and amend FMPs, the sections on dealing with protected species issues could be sent to the National Marine Fisheries Service, the U.S. Fish and Wildlife Service to ensure that we have adequately addressed protected species concerns within individual fishery management plans.

Thank you and I would be happy to answer questions.

Participant Q&A and Discussion

MR. PAYNE: Were those standards and procedures subject to the last spring meeting? Are they finalized?

MR. LAPOINTE: Yes, finalized and published.

MR. PAYNE: Can they be amended or reviewed?

MR. LAPOINTE: Yes, they can be amended by our Commission based on the recommendations of our ISFMP Policy Board. One recommendation that has already been made in the two months that we have had them out is to put the chairs of our advisory committees as voting members on our species management boards. So if there were a recommendation coming out this group and the management and Science Committee recommended that the charter be amended, that could be done.

DR. MUSICK: Do joint plans of the Commission and the Regional Fishery Management Councils contain protected species sections?

MR. LAPOINTE: Joint plans do have protected species sections. We have a number of joint plans with the Mid-Atlantic, New England and South Atlantic Fishery Management Councils. They have to meet all the criteria of Magnuson Act plans and, because of that, have endangered species and protected species sections.

DR. MUSICK: I thought the Commission's FMPs would do the same thing. I am surprised they do not. I always thought they did.

MR. LAPOINTE: I do not think we have in the past, because it is an issue we just have not dealt with yet.

MS. COOGAN: The problem with a lot of the fishery management plans, from a protected species perspective, is that they are managing the fisheries by target species, not by gear type. Protected species are taken by gear type, certain types of gear that are nonselective, so it is probably a general bycatch problem, but it makes it kind of hard to manage when the fishery management process is done by targeted species.

DR. MUSICK: I know, but you can confound matters by not doing that, because very often gear types may stay the same or change slightly, as in mesh sizes for gillnets. The target species change from season to season but so do the bycatch species. So for instance, the spring fisheries for shad and spiny dogfish fishery hammer *Phocoena,* while the summer gillnet fishery does not; it catches sea turtles.

So there may be some utility, rather than banning all fishermen who use one kind of gear, to address these fisheries as species or species group-specific fisheries, because the gear may change slightly and, because of seasonal changes in the vulnerable endangered species

MS. COOGAN: Yes, I think it is more a question of seasons than specific changes in the gear, because *Phocoena* are not taken because they are not there. Turtles are not taken in the winter, because they are not there. When protected species and gillnets occur at the same time and place, protected species are taken, depending on the season.

MR. LAPOINTE: I think folks recognize that and do not know, frankly, how to deal with the issue, so I hope you give us some good suggestions in the next day or two.

MR. STREET: I was in the group that wrote the Charter. In fact, I drafted the initial standards. There are six of them. One of them says measures shall be designed to minimize waste of fishery resources. This committee is our first attempt to deal with the issue of bycatch at all and, as was said, we believe there is a lot of education to do first. I think the Commission is going to deal with it, but it has got to be in an orderly fashion. The Commission is going through a tremendous change now in response to the Atlantic Coastal Act.

MR. PAYNE: I have a couple of questions about the Commission. There are two or three people who act as advisers from the National Marine Fisheries Service who sit on species management boards and technical committees -- do they vote in the final Commission vote?

MR. LAPOINTE: No.

MR. PAYNE: So they make recommendations up through the development of the FMPs and then it is taken to the Commission to approve or disapprove?

MR. FIELD: At the Management Board level, federal representatives from both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service can vote for approval or disapproval of any FMP, so they are in the last step before it goes to the full Commission.

MR. PAYNE: One last comment, if a FMP deals with protected species issues could a state be found out of compliance because of protected species measure?

MR. LAPOINTE: FMPs contain both compliance and non-compliance measures. It depends on how it was incorporated into the FMP. Because of the fear of agencies on how to handle this issue, there is going to be a reluctance on their part to make protected species issues compliance criteria in FMPs. We are all trying to learn how to live with the issue and they do not want to make it something that is going to tip the apple cart right away.

MR. PAYNE: But the alternative is if they do not do it, we do it through some regulation.

MR. LAPOINTE: That is a good point.

MS. BERGER: That does not mean that if it is not a compliance issue that it is not followed. There are many voluntary measures that are presented in the FMPs that are upheld by all of the states. It is the same thing with habitat right now.

DR. MUSICK: It seems to me, though, you do the same thing NMFS does, which is essentially preparing an environmental impact statement that includes statements about the potential impact on endangered species. You prevent the fisheries from being blind-sided all of a sudden by a bunch of regulations. They may have to comply to regulations eventually, but at least you are addressing the problem. Very often, the magnitude of the problem may not be immediately apparent; it is just kind of there somewhere, like the sea turtle/flounder interaction. It took a while for people to realize just how severe that was.

MR. LAPOINTE: Right. I think the other thing is folks would rather, as Lew mentioned earlier, handle it on as local a level as possible. Because I do not know what recommendations you are coming up with but if Maine can handle it in Maine's waters based on recommendations in a Commission plan, that is going to be better in their minds than NMFS regulations. I think the states recognize that if they do not deal with it forthrightly, that they are going to see your regulations anyway.

MR. KAELIN: I think that under the existing laws you are going to see NMFS regulations no matter what the Commission does. I agree with your point that it is valuable to tackle it in the interstate plans for information purposes only. I think, realistically, that is all we can accomplish right now with the Commission plans on this issue, because the states do not have federal authority to take over management of these species. It can be done only in cooperation with the Fisheries Service right now and, frankly, I do not think the Fisheries Service wants to give that authority up.

MR. LAPOINTE: The states' plates are already full and it is a very controversial issue. I could see a number of states not wanting to take it if it were offered.

MR. KAELIN: That may be. I would like to see it develop so that the federal government gives the states that opportunity. In the meantime, I think what you can do with the Commission is simply give the people who are being managed the information so that they do not have to read the Federal Register, for example, to know that these hearings are taking place. Some of us do that, anyway, but from an industry perspective that would be the value of tackling it.

MR. PAYNE: In closing, the issues that we are talking about now will take a while to develop. There are certain immediate issues that will have to be addressed in the next day or two, if we can do it. One of them, which is immediate, is in the next six months, the harbor porpoise issue. We will talk about that, I suppose, tomorrow.

The reason that it is immediate is because there is already established an allowable take level, referred to as a PBR for potential biological removal. Although North Carolina and Virginia and up to New Jersey take a certain level of porpoise, most are taken in the Gulf of Maine. The Gulf of Maine gillnetters do not want to share their PBR; they want it all. They want to be able to have the maximum number possible, which would put the gillnetters in the Mid-Atlantic out of business.

MR. LAPOINTE: Could the groundfish plan do part of that work?

MR. PAYNE: Not in state waters, not in the mid-Atlantic.

MR. LAPOINTE: That is a good point. No, I meant the PBR for the New England region.

MR. PAYNE: The take reduction team will have to take that up. I hope there will be members from the Commission that sit on the team, who will realize that the real hard part will be not to determine what to do, but rather how to allocate the PBR. And that is going to happen fast. It is going to require fishery management measures to be in place fairly fast. But in thinking how to develop this long-term, we have to have short-term problem.

MS. COOGAN: Actually, we have got an even more immediate right now because from south Virginia through mid-North Carolina there are dozens of turtle strandings occurring. We are working under an emergency response plan managing the shrimp fishery and we are being held to manage other fisheries with equal responsibility. We do not have any observers out in these fisheries, we have no data. All we know is there are a lot of gillnet effort occurring in these regions and there is no shrimping and these turtles are coming in. It is a very litigious atmosphere right now; we are being sued on all sides.

MR. PAYNE: My comments were not meant to intimidate or scare, but I think NMFS is in a position right now to really move to working with states in any way possible. We realize there are issues we have overlooked for years and they are not getting smaller; they seem to be growing for some reason. We need to move as quickly as possible.

MR. LAPOINTE: Just a question. How long have the take reduction teams been brewing in the National Marine Fisheries Service? When was the Marine Mammal Protection Act amended to include it? I seem to remember that that was a number of years ago. Was it recent?

MR. PAYNE: Yes and no. The harbor porpoise working group was established in New England in 1989 or 1990. The group was put together to try to come up with plans to take care of bycatch issues before fisheries had to get involved. It did not work completely. It was perceived as such a good idea that that became a template for all these regional take-reduction teams. Some of the teams may not be as needed as they were five years ago, because other things have taken their place, but that is kind of where it got started five years ago.

MR. LAPOINTE: That is ignorance on my part, because I dodged in and out of marine fish issues, and I apologize for that. But because folks do need to know about this -- our newsletter articles are due the first of August -- it would seem like an article on the two issues you mentioned, how to deal with harbor porpoise and how to deal with the turtle strandings issue would be appropriate. Just a short-term thing we could do to get the information out to a whole lot of people.

DR. BLAYLOCK: About your newsletter, have you reviewed the recent amendments to MMPAs that may affect fisheries at all?

MR. LAPOINTE: No. Good suggestion.

SESSION II: ISSUES & CONCERNS

State Fishery Interactions with Protected Species from Maine to Maryland

by
Laurie Allen Silva
Northeast Region, Protected Species Program
National Marine Fisheries Service

Our mission as the Protected Species Program of the National Marine Fisheries Service (NMFS) is not only to protect endangered and threatened marine species, but to promote conservation and recovery of populations. Dealing with protected species and fishery interactions in state waters has always been problematic because of the artificial line drawn between state and federal waters. These species recognize only environmental boundaries and divide their time during various stages of their life cycle and during different seasons in both environments and are more likely to come into conflict with man the closer they get to the heavily populated coastline. The involvement of the Atlantic States Marine Fisheries Commission in an active protected species conservation effort is an important step in providing a missing link in the protection and recovery of these species.

The NMFS Northeast Region (NER) includes the states of Maine through Virginia, although the following discussion covers Maine through Maryland. Within this range, the chelonid sea turtles (loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), and green (*Chelonia mydas*) occupy coastal embayments out to the Gulf Stream in various seasons from Maryland north to Cape Cod Bay, migrating offshore to inshore and north to south during various seasons. Coastal northerly waters provide important developmental habitat for juvenile and subadult loggerhead and Kemp's ridley sea turtles. Leatherbacks (*Dermochelys coriacea*) are found throughout the Gulf of Maine and Atlantic coast in all seasons. They are able to thermoregulate to some degree and are not as susceptible to the cold stunning that sends the chelonid turtles south as the waters cool in the fall. Various species of marine mammals occupy the entire coastline during various seasons, also making some use of shallower coastal areas as foraging and resting opportunities and as part of their migratory routes.

Based on documented takes from NER and Northeast Fisheries Science Center (NEFSC) databases including the Marine Mammal Exemption Program logbooks, fishery observer coverage, entanglement and stranding databases, the primary gear types involved in protected species interactions include bottom trawl, gillnet, longline, lobster pot gear, fish weirs and pound nets.

The following discussion mentions data from the NER entanglement database. In many cases the specific gear type or fishery could not be determined and only the specifically identified gear interactions are included in the examples. Therefore, the numbers given probably underestimate the interactions. In addition, this database should not be confused with the stranding database which includes all stranded animals where the direct cause of death is very often undeterminable.

The disentanglement data represents incidents where efforts were made to disentangle an animal or where entanglement was positively observed.

In addition to looking at takes in specific state areas, this discussion will be concentrating on the gear types and their potential for interactions. The best approach for assessing fishery interactions in state waters may be to relate the number of vessels/participants in the fishery and the probability that a specific gear type will impact protected species.

Bottom Trawl Fisheries

Based on NMFS weigh-out data, the majority of bottom trawl effort occurs offshore south of Cape Cod and east of the New York Bight peaking in winter and early spring before loggerhead, Kemp's ridley, and green turtles have arrived for the summer. These species are known to be taken in bottom trawl fisheries. In the Northeast, they spend a considerable amount of time foraging on the bottom, usually at depths less than 50 feet. Leatherbacks are present in areas with significant fishing effort during peak seasons, but because of the pelagic nature of their prey they are not as susceptible to bottom trawls.

Bottom trawl effort does, however, peak in the nearshore waters of Delaware Bay in late summer when turtles are actively moving from inshore to offshore waters. In the nearshore and offshore waters of North Carolina and Virginia, bottom trawl effort peaks in the fall when turtles are migrating south. Therefore, in addition to the well documented takes in the North Carolina, southern Virginia flounder fishery, it is likely that bottom trawlers incidentally capture turtles as far north as Delaware Bay where the distribution of fishing effort and sea turtles overlap (NMFS, 1994).

While stranding data from the summer through fall seasons are not all directly attributed to fisheries interactions, the Sea Turtle Stranding and Salvage Network (STSSN) database shows a trend of increasing turtle strandings from New York through Virginia, beginning in June and peaking in the months of July through September. This can partially be attributed to their increased presence in the area and the increase in recreational boating during the same season that is responsible for a portion of the strandings. The extent of fishery involvement in this trend is unknown because the cause of death has not been determined in many cases. The majority of the chelonid turtles stranded in Massachusetts for reasons other than cold stunning are loggerheads and occur in late summer and fall; Rhode Island bottom trawl fisheries are also active during the summer and fall and would also be expected to encounter loggerheads. There is a sea turtle/fishery overlap in New York and New Jersey during the period of their migrations up and down the coast. New York's embayments also support a summer foraging group of Kemp's ridleys and loggerheads. As noted above, non-cold stunned strandings in these states peak during summer and fall. In Maryland, loggerheads and Kemp's ridleys are summer residents foraging in the Chesapeake Bay, which the state closes to trawl gear year round. Most stranded turtles in Maryland from May through November are loggerheads. It is unknown whether trawl fisheries,

operating at least a mile outside the coastline because of these closures, play a role in these strandings.

Bottom trawl gear is more of a hazard to turtles than mammals, but interactions do occur. The NER entanglement database documents cetacean entanglements specifically in bottom trawl gear as follows: a humpback whale (*Megaptera novaeangliae*), alive in an otter trawl on Jeffrey's Ledge off Massachusetts, a humpback whale in New Jersey that was initially alive, but died after a failed rescue from trawl net, and a humpback whale entangled alive, carrying part of a bottom trawl net in Massachusetts waters. This data is not always easy to interpret. Identifying what fishery the gear was used in is often a problem and in the case of dead animals, it is not always known if the animal died as a result of the entanglement or was entangled after death from another cause. As a result, many more entanglement reports are in the database where the type of net is not specified. Again, this means that the extent of interactions is underestimated by these figures. Further documentation is necessary to delineate the extent of these interactions specifically in coastal waters. The other major deficiency is the ability to pinpoint the timing of these occurrences with a particular fishery operating in state waters. It is here that a state's knowledge of its fisheries is invaluable to these efforts.

Other marine mammals documented as taken by Gulf of Maine (GOM) and Mid-Atlantic bottom trawl gear include atlantic white-sided dolphins (*Lagenorhynchus acutus*), bottlenose dolphins (*Tursipos truncatus*), pilot whales (*Globicelphala melaena*), and striped dolphins (*Stenella coeruleoalba*). Although not endangered, these mammals are protected under the MMPA.

In summary, bottom trawl gear is capable of taking a wide variety of species including turtles, whales and dolphins. In addition, information on this bycatch is scant for the coastal segments of these fisheries. Many of these protected species follow the same north/south and offshore to inshore movements as the fish and their associated fisheries, so the potential for interactions in state waters during certain seasons at different points along the coast are obvious.

Gillnet

The coastal gillnet fisheries along the Atlantic coast have the highest amount of bycatch, both in numbers and in variety of species including turtles, dolphin, porpoise and large whales.

Based on stranding data from the Virginia Marine Science Museum for 1993, 34 bottlenose dolphin and 24 harbor porpoise (*Phocoena phocoena*) strandings occurred during the time of the winter/spring coastal drift gillnet fishery targeting shad, weakfish and sea trout. The numbers during the same period for 1994 were 22 and 44, respectively. These individuals were necropsied during a session at the NEFSC in 1995 and many showed evidence of entanglement. Of the 68 animals examined, 41 were in good enough condition to be evaluated for human interaction (i.e. net marks). Fifty-one percent showed no signs of human interaction and 46 percent did -- these percentages can be used to provide a minimum estimate of the take in this fishery (60 FR 31666).

The Gulf of Maine-Bay of Fundy bycatch by the U.S. Gulf of Maine sink gillnet fishery was between two and a half and six percent of the estimated population size from 1990 - 1993, considered high by the International Whaling Commission since there is bycatch in other U.S. and Canadian fisheries (NEFSC, 1992). To provide a perspective on how many animals this represents, the estimated numbers of animals taken during 1990 - 1993 were 2900, 2000, 1200, and 1400 respectively.

Sink gillnets are active during the late spring, and from October through February south of Cape Cod, and East of the New York Bight when whales are moving on their migratory routes. They are also active in the nearshore waters from Chesapeake Bay through New Jersey, peaking in May and June when sea turtles are also moving into the area (NMFS, 1994). Gillnetting is a substantial portion of the fishery in Delaware state waters; it is mostly fixed gillnets in Delaware Bay that peak in April and May, also when sea turtles are moving into the area.

The potential for take of marine mammals in gillnet gear is clear, but information on takes in specific coastal fisheries has not been adequately documented. Minke whales (*Balaenoptera acutorostrata*) and humpback whales are the most frequently entangled large whales in gillnets in the northeast; harbor porpoise and bottlenose dolphin are the most common small cetaceans and harbor seals are also taken.

The NER entanglement database has 19 records of endangered whale entanglements specifically attributed to gillnet gear up until 1993. Ten were humpbacks in waters off the Massachusetts coast, two humpbacks in Virginia, and one humpback in New York, one minke whale from Maine and two right whales (*Eubalaena glacialis*), one in Bay of Fundy and one in Massachusetts. It is not known if these entanglements actually occurred in state waters, but the states are given as an indication of the areas where the entanglement occurred. The Marine Mammal Exemption Program logbook database from 1992 shows takes in the Gulf of Maine groundfish sink gillnet fishery of harbor seal (*Phoca vitulina*), harbor porpoise, common dolphin (*Delphinus delphis*), striped dolphin, atlantic white sided dolphin, gray seal (*Halichoerus grypus*), spotted dolphin (*Stenella sp.*), and finback whales (*Baleanoptera physalus*). The highest number was harbor porpoise (102) and Atlantic white-sided dolphin (50) -- all the harbor porpoise were mortalities and 47 of the 50 Atlantic white sided dolphin were mortalities. All of the known entangled finback survived unharmed. Data from 1990 and 1991 showed a similar trend, although common dolphin mortalities were as high as white sided dolphin in those years. The proportion of these attributable to state waters is not known at this time, but these numbers show the potential of this gear to take protected species. As already mentioned, the Mid-Atlantic shad coastal gillnet fishery was implicated in 1993 harbor porpoise strandings in Chesapeake Bay and along the New Jersey coast (NEFSC and SEFSC, 1995).

Shortnose sturgeon (*Acipenser brevirostrum*) are less often figured into the bycatch picture, but are known to be taken in the southern atlantic coast shad gillnet fisheries (Collins et al., in press). Shortnose sturgeon are anadromous, but do occupy saline environments of some rivers and bays

during overwintering and summer foraging periods of their lifecycle. NMFS receives little information on takes by state recreational and commercial fisheries and this is a definite area where state involvement could improve existing information.

In summary, the greatest threat from gillnet fisheries in northern waters is to whales, dolphins and porpoises, although sea turtles are also occasionally drowned in gillnets. The NEFMC has taken a proactive approach in establishing closed areas in the Gulf of Maine during certain seasons to protect harbor porpoise and promote its success before a listing as endangered or threatened is necessary. This is a good example of how the Atlantic States Marine Fisheries Commission and the fishery management councils can work with conservation agencies and the fishermen to both protect these species while allowing the fishery to continue, albeit with some restriction. In addition, many states already limit drift and fixed gillnet gear in coastal areas where sea turtles are most likely to be found. Take reduction teams are also being established to address the incidental take of marine mammals that exceeds what is believed to be allowable for maintenance of an optimum sustainable population. A team for harbor porpoise is currently being developed to specifically reduce the incidental takes of harbor porpoise in gillnets while minimizing the impacts on the fishery.

Longline

These fisheries tend to be concentrated in offshore waters and would not be affected by state management activities so they will only be addressed briefly here. Longline fisheries are known to take loggerhead and leatherback sea turtles. The fisheries are most active in late summer and fall which coincides with migratory activities of loggerheads. Because leatherbacks live primarily a pelagic existence, and the gear is used for large pelagic finfish, the probability of interactions with this type of gear are probably the highest for leatherbacks. While observer data shows large numbers of takes in this fishery, most of these animals are released alive. However, incidents where the hook remains in the turtle after release are considered mortalities because the actual effect on the animal's survivability is unknown. These fisheries do not occur in state waters, but the gear type is used in a fashion similar to a fixed gillnet to capture flounder and other groundfish in coastal areas. Takes of protected species in this coastal fishery are unknown, but would most likely interact with loggerhead sea turtles.

As of 1993, the NER entanglement database shows four humpback whale entanglements specifically attributed to longline gear, all in waters off the Massachusetts coast. Marine Mammal Exemption Program logbook data indicates that harbor porpoise, bottlenose dolphin, Risso's dolphin (*Grampus griseus*), Atlantic white-sided dolphin and pilot whales are taken in these fisheries.

Lobster pot gear

The coastal lobster fishery is one of the predominant gear types interacting with protected species in state waters. Lobster pot gear is one of main causes of leatherback strandings in the Massachusetts (Prescott, 1988). The NER entanglement database shows that interactions with lobster gear since 1975 include: 18 humpback whales (New York, New Jersey, Massachusetts), four minke whales (Maine, Massachusetts, Gulf of Mexico), six finback whales (New York, Massachusetts) and one blue whale (*Baleanoptera musculus*) (Massachusetts) -- this rare visitor to Massachusetts waters was trailing a line and buoy with no apparent problem. Although no right whales have been observed dead in lobster gear or line, Kraus (1990) reported entanglement scars over 50 percent of all identified right whales, suggesting a high rate of unobserved right whale/gear interactions. A definite potential for interactions with this gear occurs in state waters, although mortalities from these interactions are generally low, with the exception of leatherback sea turtles. Opportunistic reporting in this fishery may be the best means to identify trends.

Fish Weirs & Pound Nets

Entanglement records of protected species in fish weirs reflect the areas using that gear -- there are 56 active weirs in Maine (mostly herring) and 180 in the Bay of Fundy. Most entanglements occur in New Brunswick, with one report from New York. These included humpback, right and minke whales and harbor porpoise. The Bay of Fundy fishery take can average 70 harbor porpoise a year. Takes of protected species occur in pound nets and are a problem for Kemp's ridley and loggerhead sea turtles from Rhode Island through Virginia during summer. Musick's (1987) work on incidental take of turtles in the Virginia pound net fisheries in the Chesapeake Bay indicated that they were the cause of death in less than one-third of the strandings. Similar turtles captures have been described in Long Island waters with few mortalities reported. Musick also found that net construction of the leaders was the significant factor in entanglement -- decreasing mesh size in the leaders of these pound nets decreases the threat of entanglement and may be an effective management strategy to prevent these takes. Again, opportunistic reporting in these fisheries where they occur would provide the information necessary to establish trends like those identified by directed research efforts in Virginia.

Conclusions

Coastal trawl, gillnet, pound net and trap fisheries are known to take protected species, but not enough data is available in many cases to assess trends or draw conclusions on management strategies. Opportunistic reporting in some of these fisheries, expanded observer coverage, and assessment of the number of vessels and participants in relation to the gear type will help to identify problem areas. A consolidated analysis of what coastal fisheries operate in what areas during what seasons could be related to species distribution to provide an overall picture of possible interactions. In addition, state assistance in observing or monitoring these fisheries would be beneficial.

More work is definitely needed to reduce cetacean entanglement in coastal gillnets. Restricting use of gillnets through time/area closures, the use of alternative fishing techniques, net modifications, and sometimes total bans can all be considered in evaluating management strategies depending on the region, fishery and species involved. Entanglement varies with the fishery, net type, means and timing of deployment, mesh size, target species, and behavior of the incidentally captured species (Silber et al., 1994). State assistance in implementing appropriate regulations is important.

Another area where states may be effective in reducing entanglement is to participate in efforts to recycle gear so that it doesn't end up as debris in the ocean. Recycled nets and traps can be melted down and marketed abroad to become a variety of products such as autoparts, bike seats or electronic components. This is already being undertaken in many parts of the country.

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Participant Q&A and Discussion

MR. STREET: You pointed out a study in which pound nets with small mesh are better for protected species, but pound nets with large mesh are better for release of bycatch of undersized fish. Is the difference between the leader and bag meshes?

DR. MUSICK: I did the study. If turtles get into the bag end of pound net are in hog heaven, because they get all the free food they want in there and they are quite safe. It is just that in some instances they get tangled up in the leaders.

MR. FIELD: Just out of curiosity, do you have any reports of entanglement of the smaller critters with discarded monofilament fishing line? Has that ever been reported?

MS. SILVA: I do not know, I would have to look into the database for that.

MR. THEILING: Did you indicate that those takes of leatherbacks were all fatal or not?

MS. SILVA: I did not include that, and I did not include a percentage, either, so I cannot answer that. That information is available, though. The majority of them would be mortalities.

MR. PAYNE: I think the observers, when they release a leatherback, if the hook is left inside the turtle or the line is cut and the turtle has ingested the hook, it is considered a mortality, whether it is alive at the time of release or not.

MR. LESSER: Are there any data for the differences between fixed gillnets and drift gillnets?

MS. SILVA: Most of the data are for fixed gillnets. They can be separated in the database.

MR. LESSER: Do you know if there is a difference in the mortality?

MS. SILVA: Are you talking about just in-state waters or overall?

MR. LESSER: Whatever. Because there is continual attendance to a gillnet. Are they readily removed if there is continual attendance at the gillnet?

MS. SILVA: That depends on the species involved, I think.

MR. PAYNE: The data we have available through fisheries are primarily from several small-scale observer programs. The best percentage we have is about seven to eight percent in a year. I do not know of any fisheries where they have continual attendance that we observed.

Interactions of Fisheries with Sea Turtles and Marine Mammals in Virginia

by
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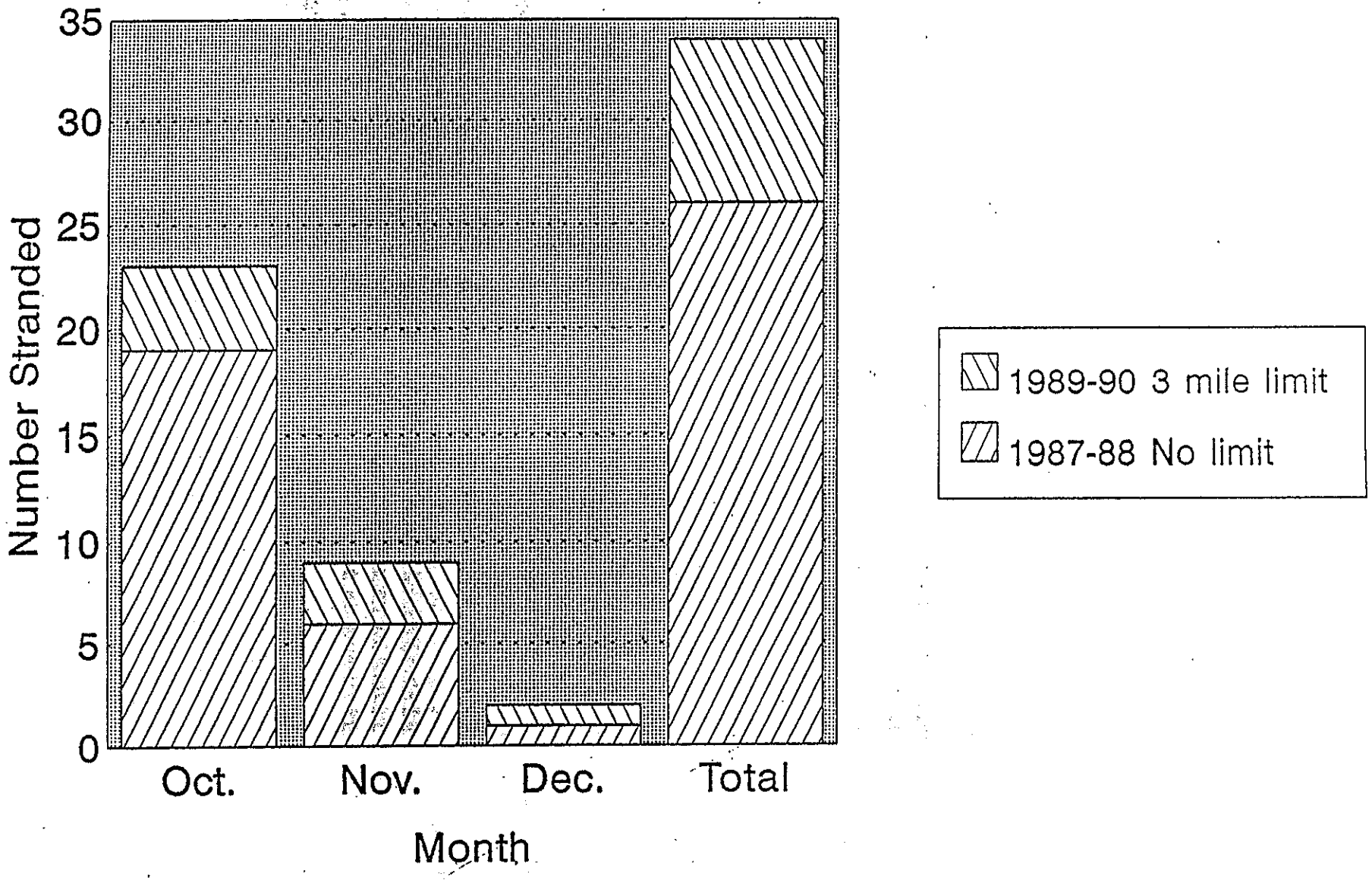
Introduction

The Virginia Institute of Marine Science (VIMS) has served as the National Marine Fisheries Service (NMFS) Sea Turtle Salvage and Stranding Network (STSSN) stranding center for Virginia since 1979 and has been a Marine Mammal letter holder since 1987. As such, the VIMS program has organized a state stranding network comprised of about 100 cooperating individuals and agencies. When possible, dead stranded turtles and mammals are identified, measured, and weighed. In addition, hundreds of sea turtles have been necropsied by VIMS scientists to determine cause of death, sex, and food habits and to study age and growth (Bellmund et al. 1987; Keinath et al. 1987; Klinger 1988; Lutcavage 1981; Lutcavage and Musick 1985; Musick et al 1985). In recent years rapid response to marine mammal strandings has been improved with the cooperation of the Virginia Beach Marine Science Museum, which became a marine mammal co-letter holder with VIMS.

In addition to providing stranding data to the STSSN coordinator at the NMFS laboratory in Miami and the Northeast Region NMFS, the VIMS program has provided real-time monitoring of sea turtle and marine mammal mortalities in order to recognize and determine causes of unusually high stranding events (Keinath et al. 1994; Musick et al. 1990). The VIMS program was the first to recognize the high sea turtle mortality and associated strandings caused by the fall flounder fishery between the mouth of Chesapeake Bay and Cape Hatteras, North Carolina during 1987. An important element of the seaside fall strandings is that Kemp's ridleys make up a much higher proportion of the total than they do in Virginia the rest of the year. Consequently, through VIMS urging, the Virginia Marine Resources Commission closed all Virginia state waters (offshore to a distance of three miles) to otter trawling in 1989. Fall sea turtle strandings dropped considerably after that action (Figure 4). Unfortunately, fall strandings increased again after 1990, probably because trawlers fished illegally within the prohibited three mile zone at night when they could not be detected by VMRC aircraft. Strandings along Virginia's seaside began to increase in autumn 1991 (Anon. 1992). In 1993, 45 turtles stranded along ocean beaches in September, October and November, five of these were Kemp's ridleys. Early turtle mortalities may have been inflicted by gillnets set between the Chesapeake Bay Bridge Tunnel and Cape Henry for spot (*Leiostomus xanthurus*). However, most of the strandings were outside of this area. Existing NMFS regulation mandated that Turtle Excluder Devices (TEDS) be deployed in otter trawlers in flounder fishing as of October 20. Sea turtle strandings continued to occur for about 10 days after that date, but these animals may have taken several days after their capture

Figure 4. Number of Turtles Stranded in Virginia Beach, Virginia in 1987.

During 1987 - 1988 there were no flounder trawling restrictions, however, Virginia enacted a trawling moratorium in 1989 and no trawling was allowed within three miles.



and death to decompose, bloat, and be carried on shore. It is pertinent that North Carolina did not see the high levels of sea turtle stranding in 1993 that Virginia did because the turtles and fishery both migrated into North Carolina waters after TED enforcement was implemented.

Sea turtles that use the Chesapeake Bay as a summer foraging area emigrate with falling water temperatures in September and October and swim south along the coast of North Carolina where they pass Cape Hatteras in November and December (Keinath 1993; Musick et al 1987). Sea turtles have essentially departed the water north of Oregon Inlet, North Carolina by mid-December or early January (Keinath 1993; Musick et al. 1987). Sea turtles usually migrate into Chesapeake Bay in late May and early June (Bellmund et al. 1987; Byles, 1988; Keinath 1993; Keinath et al. 1987; Musick 1988). However, aerial surveys conducted by VIMS in spring 1994 revealed loggerheads in Virginia coastal waters as early as April 20 (Keinath et al. 1994). It is obvious that in order to avoid sea turtle mortalities TEDS should be required inshore (≤20 miles) in otter trawls fishing north of Oregon Inlet from April 1 through December 15.

High sea turtle mortalities during the spring migration in late May and early June have been documented by VIMS for 15 years (Keinath et al. 1987; Lutcavage 1981; Lutcavage and Musick 1985) (Figure 5). Some of these mortalities may be attributed to entanglement in poundnet leaders (Bellmund et al. 1987; Musick et al. 1985). Some nets with large (16-inch) mesh leaders set in the lower Chesapeake Bay where currents are strong may entangle turtles when they first enter the Bay after the spring migration. Many of these turtles are emaciated and weak (Lutcavage 1981; Bellmund 1988). These mortalities drop off substantially by the end of June, and turtles tracked using sonic and radio transmitters seem to be able to forage around the nets with little threat (Musick et al. 1985; Byles 1988). Because of economic factors, (expensive fishing gear, and high labor costs), the poundnet fishery has declined by an order of magnitude over the last 30 years and continues to decline as older poundnetters retire. Yet, the number of sea turtle strandings in spring remains high. Apparently, mortalities induced by the poundnet fishery have been replaced and perhaps surpassed by a rapidly expanding spring gillnet fishery focused on both the seaside and bayside of the Eastern Shore of Virginia. Although support has not been available to study these gillnet mortalities, it is probable that the large, heavy mesh monofilament gillnets used in the black drum fishery pose the most severe threats to sea turtles. In 1994 alone, over 100 dead turtles were reported to the VIMS Sea Turtle Research Program, however, reported strandings decreased substantially after the June 17 closure of the black drum fishery (Figures 6 & 7).

In addition to sea turtle interaction with gillnets, there is growing evidence that a rapidly expanding ocean gillnet fishery for shad (*Alosa sapidissima*) in late winter and early spring is inflicting heavy mortalities on harbor porpoises (*Phocoena phocoena*) and occasional mortalities to juvenile humpback whales (*Megaptera novaeangliae*) that winter along the Virginia coast.

Figure 5. Number of Dead and Live Kemp's Ridley Turtles Observed by VIMS Personnel in 1979 - 1993.

The large number of dead turtles in May and June may be due to gillnet fisheries and the mortalities in the autumn are probably due to trawling activities off the coast.

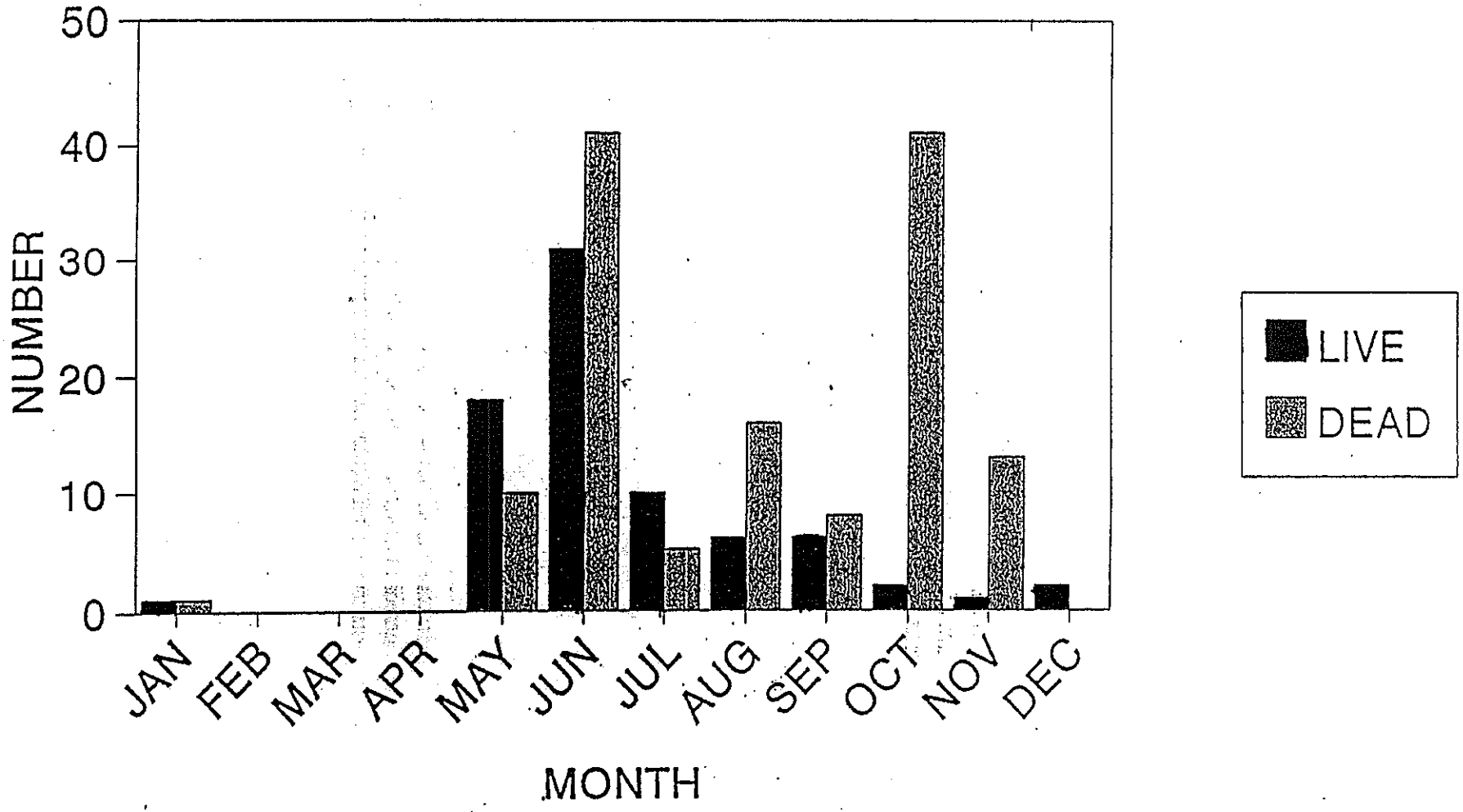


Figure 6. Number of Dead Turtles Reported Stranded to VIMS, May - July 1994.

This figure includes: (a) turtles examined by stranding network volunteers and, (b) turtles reported but not examined due to logistical and budgetary constraints. The black drum fishery closed on June 17.

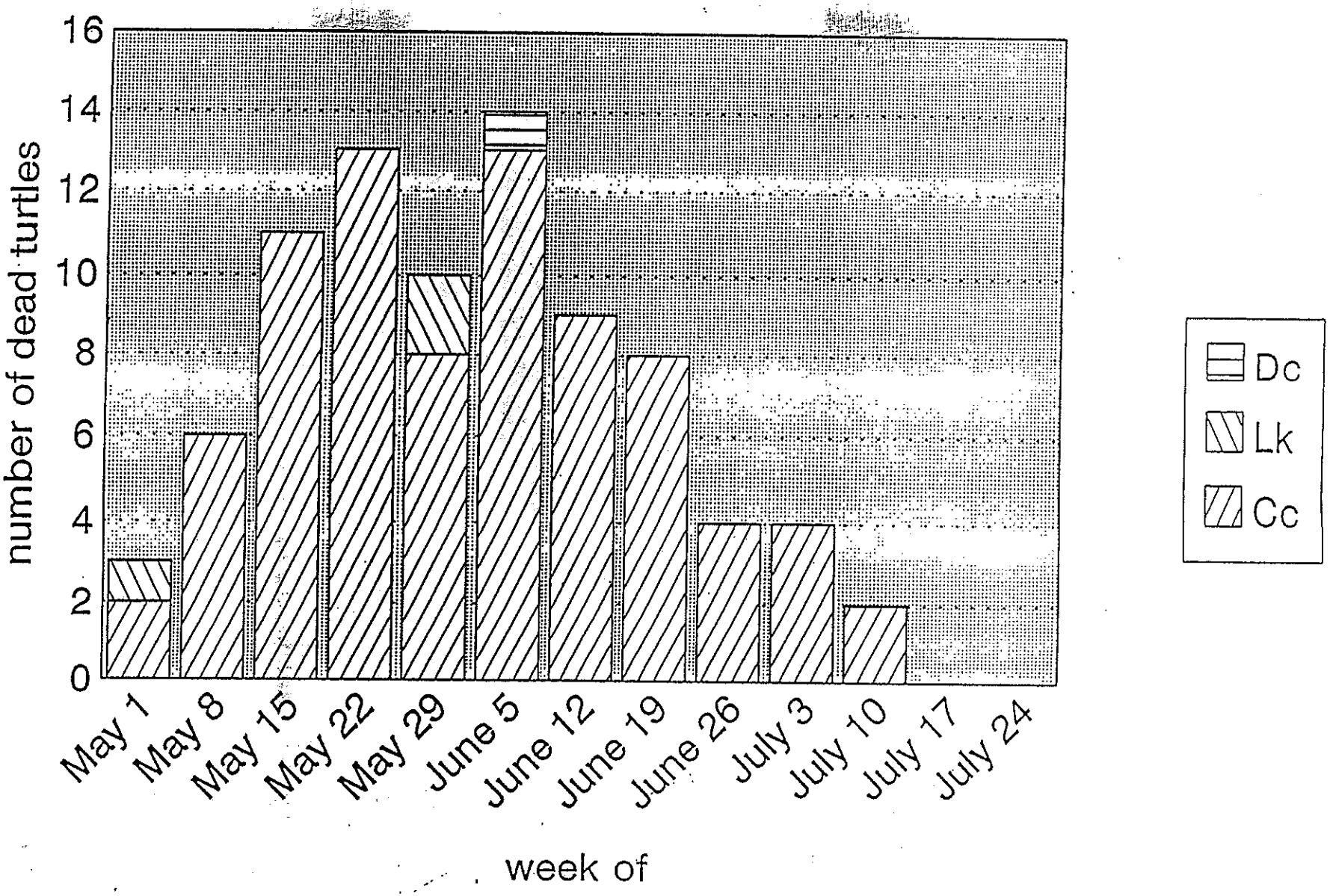
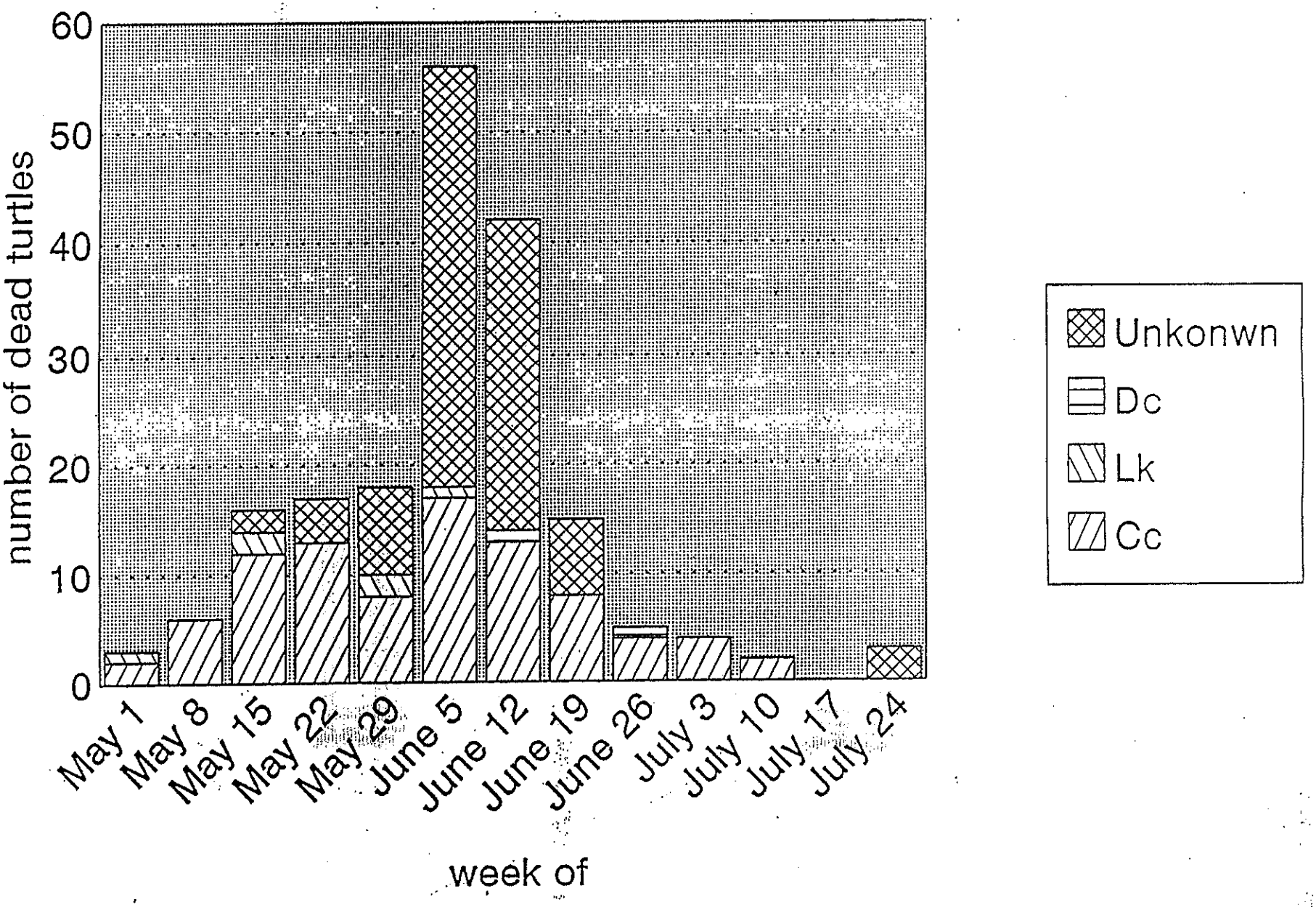


Figure 7. Number of Dead Turtles Examined by Stranding Network Volunteers, May - July 1994.

The black drum fishery closed on June 17.

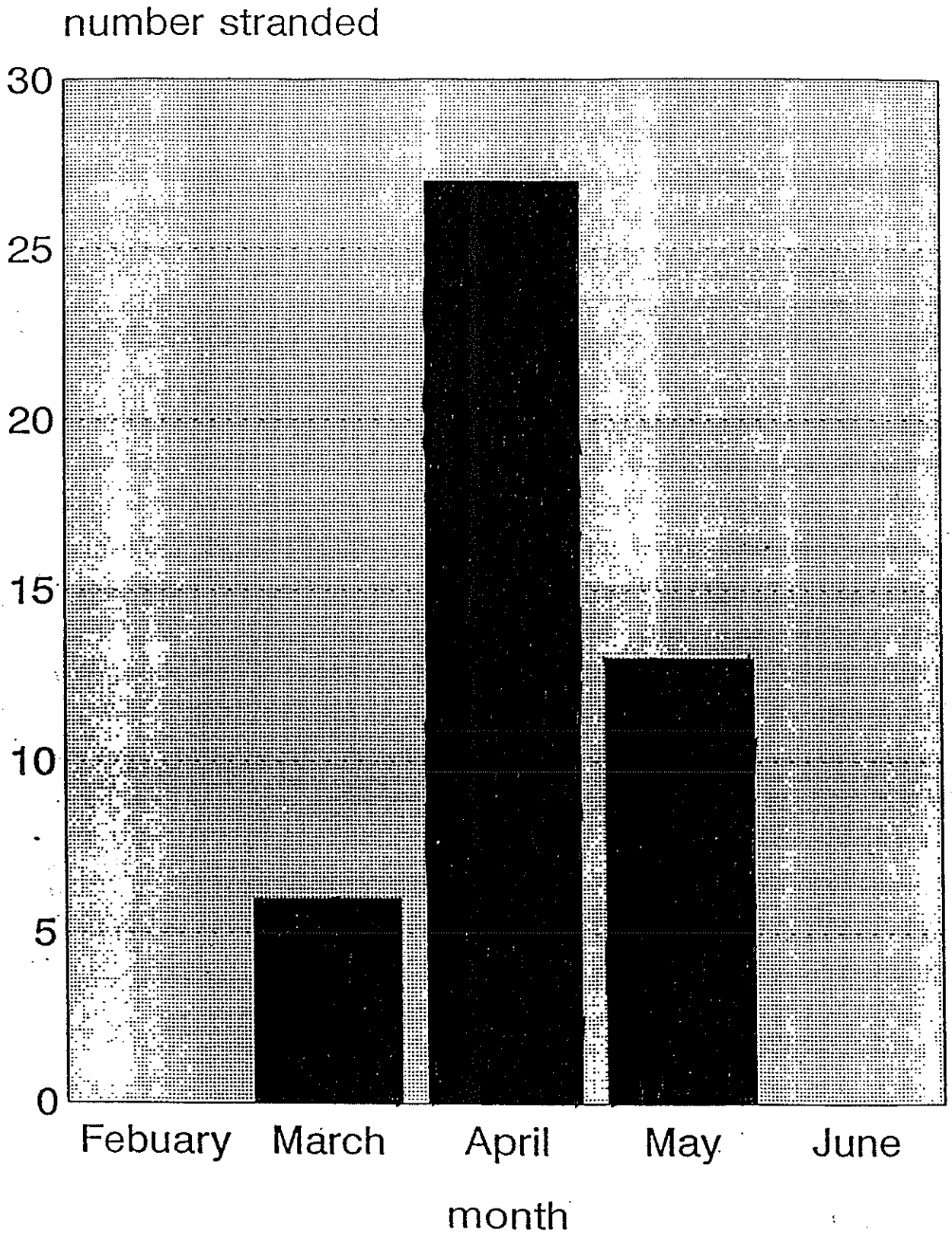


In 1994, 46 harbor porpoises were stranded in Virginia between March and May (Figure 8). Much of the Virginia coast is remote and accessible only by boat, especially north of the Bay mouth. Therefore, it is probable that some, if not many, additional harbor porpoise mortalities occurred and went undocumented.

All of the information cited above, and indeed most of what is known about sea turtles and marine mammals in Virginia, has been gleaned from studies conducted by the VIMS Sea Turtle and Marine Mammal Program. Basic funding for the program was provided for many years by the Virginia Non-Game Fund administered by the Virginia Department of Game and Inland Fisheries (VDGIF). Unfortunately, that agency began to experience severe budgetary problems a few years ago, the Non-Game Fund became severely depleted, and VIMS lost funding for its sea turtle program in 1990. We have been able to continue our stranding network and limited aerial monitoring because sea turtle project personnel have been supported by other research grants and contracts. The stranding and aerial monitoring work has essentially been done voluntarily by project personnel above and beyond their research obligations. Because of deficit problems in the Virginia state budget, VIMS requests for budget addendum monies to support the sea turtle and mammal program have gone unanswered for the past four years, and we were faced with laying off personnel in the fall of 1994. Aerial monitoring has been discontinued and the stranding network has continued to function at a minimal level through the effort of volunteers.

Figure 8. Harbor Porpoise Strandings in Virginia during the Spring of 1994.

Most of these strandings occurred off the Eastern Shore (From M. Swingle, VMSM)



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Participant Q&A and Discussion

MR. STREET: The study that VIMS did in 1992 on menhaden bycatch did not find any bycatch related mortalities.

MS. COOGAN: It seems like purse seines can be fished and not kill animals.

DR. MUSICK: I do not think it is going to be a problem with mammals, but turtles are rather widespread and distributed all over the Bay and particularly at the river mouths and that is where that fishery takes place. I have no direct data other than this one study.

MR. CARMICHAEL: We have information in the Gulf about mortalities in purse seines. They have to be intentional takes, though.

Marine Mammal & Sea Turtle/Fisheries Interactions in Virginia

by
Mark Swingle & Susan Barco
Virginia Marine Science Museum

Since 1990, the Virginia Marine Science Museum (VMSM) has directed the marine mammal stranding network in Virginia. VMSM maintains a stranding database for Virginia, and more than 25 species are present in the stranding records. For the purposes of this report, the period from 1990 to 1994 will be discussed.

Data were collected from each stranding and recorded on National Marine Fisheries Service (NMFS) marine mammal stranding reports. Necropsies were preformed on all stranded marine mammals of suitable condition for internal examination. Of the many species which stranded during the five year period, three are of primary importance due to the magnitude of the problem and/or special concern regarding their population status. The three species are: humpback whale (*Metaptera novaeangliae*), bottlenose dolphin (*Tursiops truncatus)*, and harbor porpoise (*Phocoena phocoena*). Stranding records for each species were analyzed to determine monthly and yearly stranding frequencies, size and sex ratios, geographic distribution, and evidence of human interaction. The effect of observer effort and its relation to stranding trends were also examined for *Tursiops* and *Phocoena.*

The NMFS stranding report includes a section for recording evidence of "human interaction" as a potential cause of mortality in a stranding. The three possible responses are yes (Y), no (N) and could not be determined (?). Not all stranded marine mammals exhibit evidence of human interactions. Some clearly die as a result of disease, predation or other problems such as neonatal complications. These strandings are categorized with an (N). When evidence for human interaction is present (Y), it is most often fisheries related. The evidence for fisheries interactions usually involves gear associated signs such as net marks and mutilations, and in some cases attached gear. Not all fisheries interaction result in mortalities and/or strandings. Entanglements, particularly of large whales, are becoming more common, and many individuals bear the scars of such encounters. Human interactions which are not necessarily considered fisheries interactions include boat strikes and plastic ingestion. Finally, in many cases the cause of death and evidence of human interaction cannot be determined (?). Often an advanced state of decomposition precludes any determination of interaction or cause of death. In addition, small cetaceans are known to die in nets without any external signs of interactions. In these cases there is strong circumstantial evidence and/or unconfirmed report of interaction, but no direct evidence of the interaction. These animals are also scored as cannot be determined (?).

Many different gear types have been implicated in marine mammal/fisheries interactions in Virginia. These include: gillnets (different types and mesh sizes), haul seines, purse seines,

pound nets (particularly the leads), pots and associated gear, recreational gear (primarily monofilament debris).

Although several species of marine mammals and sea turtles have stranded with evidence human interaction, we will address the humpback whale, bottlenose dolphin and harbor porpoise in this report. We have provided two appendices that specifically address the above species

The increasing presence of humpback whales in the mid-Atlantic region has recently been documented in several papers. They are seasonally abundant in Virginia in the winter months (Swingle, et al. 1993), yet sighting and stranding records indicate a year round presence (Wiley, et al. 1994). Nearly all of the whales are juveniles and appear to be feeding in the nearshore waters of the state (Swingle, et al. 1993). Following this paper are two additional reports. The first titled, *Large Whale Strandings in Virginia: January 1990-September 1995*, contains the statistics for humpback strandings during the five year period. Evidence of human interaction was recorded for seven (47 percent) of the 15 strandings.

The second report titled, *Strandings of Bottlenose Dolphins and Harbor Porpoises in Virginia* (1990-1994) (in press), contains statistics for dolphin and porpoise strandings and shows that the numbers of stranded bottlenose dolphins and harbor porpoises increased dramatically from 1990 to 1995. Human interactions, in these cases fisheries interactions, were the leading potential causes of mortalities identified for these two species.

This paper and the two following it are good examples of the data and analyses which can be generated from the stranding network. These data are inadequate, however, for interpreting the true impacts to these and other marine mammal species from fisheries interactions. Those interpretations will require thorough and detailed analyses of the fisheries themselves.. Without these fisheries data, effective and, at the same time, least restrictive measures to reduce or eliminate potential interactions with protected species will not be possible.

Large Whale Strandings in Virginia (January 1990 - September 1995)[1]

by
Susan Barco & Mark Swingle
Virginia Marine Science Museum

The Virginia Marine Science Museum, located in Virginia Beach, Virginia, has been responding to marine mammal strandings since 1987. Our response effort along the southeastern coast of VIrginia has been consistent since 1990. From 1990 to present (September 1995), we have recorded 15 large whale strandings in Virginia: 10 humpback whales, 4 minke whales, and 1 fin whale (Table 2, Figure 9). During this time period, several floating whale carcasses, including a right whale, were reported but did not strand in Virginia. Additionally, one confirmed entanglement of a humpback whale (April 30, 1990) and two vessel strikes (one humpback, one unknown large cetacean species) were reported but did not result in strandings.

The strandings occurred primarily along the ocean coast (Figure 10) in all seasons (Figure 11). All carcasses were examined and a necropsy was performed on 13 of the carcasses which ranged from Smithsonian Institution condition 1 to condition 4 upon initial examination (Figure 12). The length of the stranded whales varied by species (Figure 13). The total length of the carcasses indicated that sexually immature whales were primarily involved. The gender of the carcasses was evenly divided between males and females (Figure 14).

Of the carcasses, seven (47 percent) showed evidence of human interaction (Figure 15). Necropsy records indicated that three of the seven showed evidence of rope abrasion consistent with fishery interaction. Two carcasses had terminal injuries consistent with propeller strike on the caudal peduncle; both carcasses had full stomachs. the remaining two carcasses possessed broken mandibles with evidence of some healing, indicating pre-mortem injuries. Carcasses placed in the "?" category were either too decomposed to determine evidence of human interaction, or had broken bones which may have occurred post-mortem.

Virginia Marine Science Museum Stranding Team Personnel examined 14 of the 15 carcasses, Cindy Driscoll (National Marine Fisheries Service) was present for nine of the examinations (eight humpbacks and one fin), Bill McLellan and Ann Pabst (University of North Carolina - Wilmington) were present for three of the humpback necropsies. The consistency of the examinations and thoroughness of the necropsies would not have been possible without the assistance of Driscoll, McLellan, and Pabst. We are grateful to them for their assistance and advice. Because of equipment, time, and money constraints, most of the carcasses were examined in one day, and some carcasses were not examined completely. With the support of the National Marine Fisheries Service in the investigation of large whale necropsies, we will be able to conduct more comprehensive examinations to further determine cause of death, evidence of human interaction, pathology, and life history parameters during these important stranding events.

1 This report was prepared for the Large Whale Necropsy Team System Organizational Workshop at the National Marine Fisheries Service Southeast Fisheries Science Center, Charleston, South Carolina (September 26 & 27, 1995)

Table 2. Large Whale Strandings in Virginia from January 1990 - September 1995.

FIELD #	DATE	GENUS	SPECIES	CITY/COUNTY	LOCALITY	HI	C	N	SEX	LENGTH
1990										
MM-01APR-90	90-04-01	*Megaptera*	*novaeangliae*	Virginia Beach	BBNWR	Y	3	Y	F	960.1
VMSM901006	90-06-19	*Megaptera*	*novaeangliae*	Virginia Beach	Chesapeake Bay	N	2	Y	F	830.0
MM20JUN90	90-06-20	*Megaptera*	*novaeangliae*	Virginia Beach	Sandbridge	?	1	Y	F	820.0
VMSM901013	90-11-19	*Megaptera*	*novaeangliae*	Norfolk	Oceanview	Y	3	N	M	853.4
1991										
none										
1992										
VMSM921002	92-02-14	*Megaptera*	*novaeangliae*	Virginia Beach	Lynnhaven	Y	3	Y	M	857.0
92-MM-AO-MN-39	92-09-28	*Megaptera*	*novaeangliae*	Accomack	CNWR	?	3	Y	M	976*
92-MM-AO-MN-39	92-10-09	*Megaptera*	*novaeangliae*	Accomack	Metompkin island	Y	3	Y	F	870.0
VMSM921025	92-10-22	*Megaptera*	*novaeangliae*	Virginia Beach	Dam Neck	Y	3	Y	M	908.0
1993										
VMSM931050	93-10-01	*Balaenoptera*	*acutorostrata*	Virginia Beach	Sandbridge	?	3	Y	?	523.0
VMSM931051	93-10-07	*Balaenoptera*	*acutorostrata*	Virginia Beach	FCSP	?	4	N	?	337.0
1994										
VMSM 941010	94-03-12	*Balaenoptera*	*physalus*	Virginia Beach	Fort Story	Y	3	Y	F	1635*
VMSM 941078	94-06-24	*Balaenoptera*	*acutorostrata*	Accomack	CNWR	?	4	Y	M	390.0
VMSM 941084	94-08-15	*Balaenoptera*	*acutorostrata*	Hampton			4	Y	?	ND
1995										
VMSM951028	95-06-04	*Megaptera*	*novaeangliae*	Virginia Beach	Damn Neck	Y	3	Y	M	886.0
VMSM951043	95-08-19	*Megaptera*	*novaeangliae*	Mathews	Gwynns Island	?	4	Y	F	880*

KEY

HI = evidence of human interaction
C = condition
N = necropsy
LENGTH = centimeters
* = estimate

Figure 9. Baleen Whale Strandings in Virginia, 1990 - September 1995.

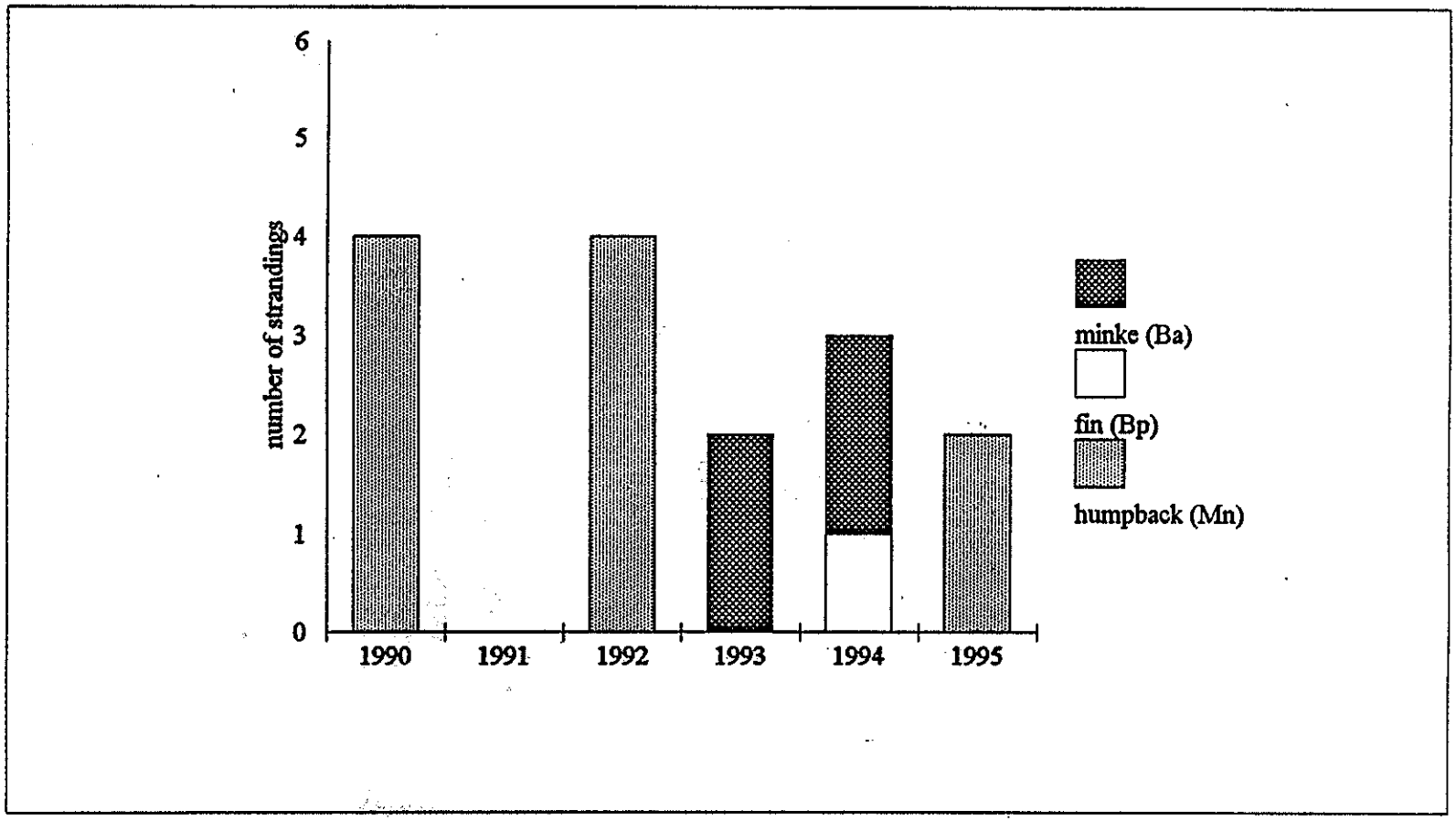


Figure 10. Large Whale Stranding Distribution in Virginia 1990 - September 1995.

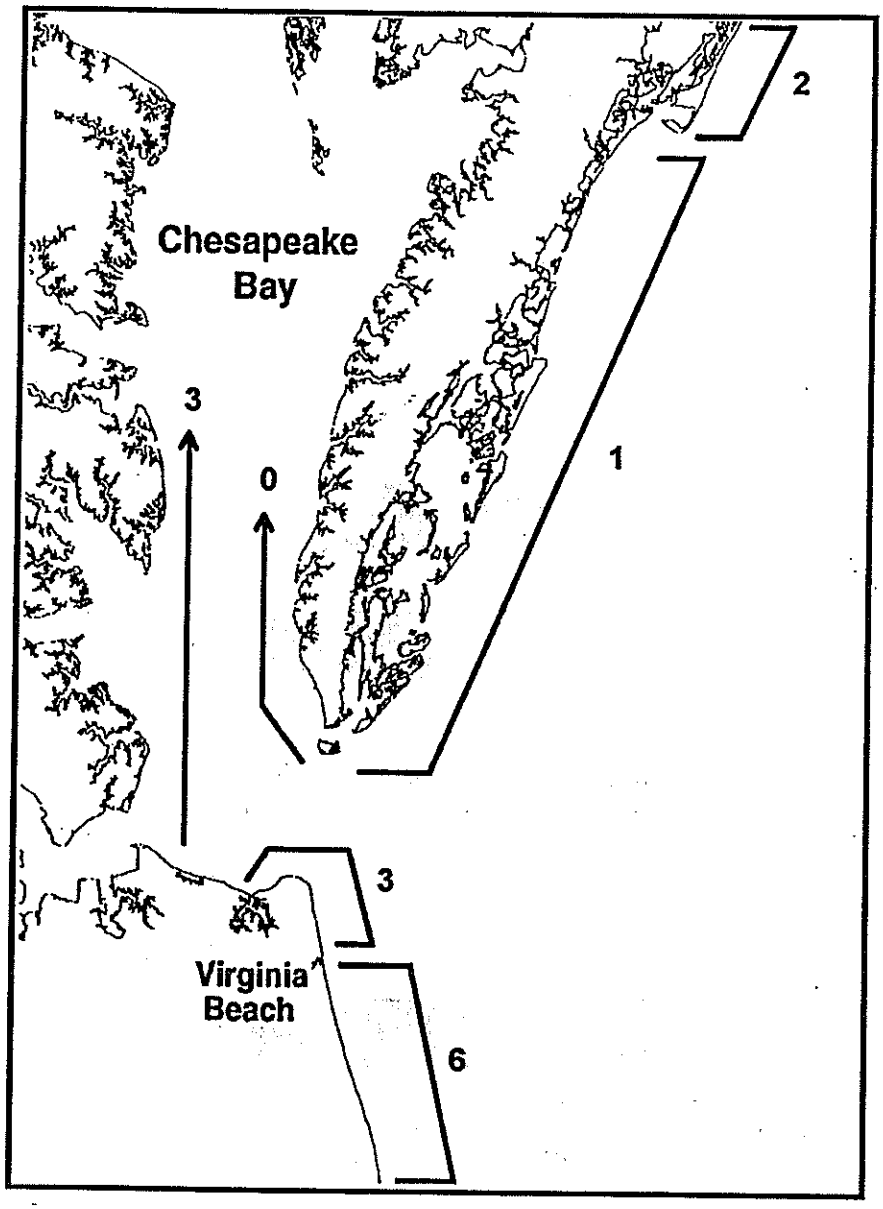


Figure 11. Monthly Frequency of Large Whale Strandings in Virginia, 1990 - September 1995.

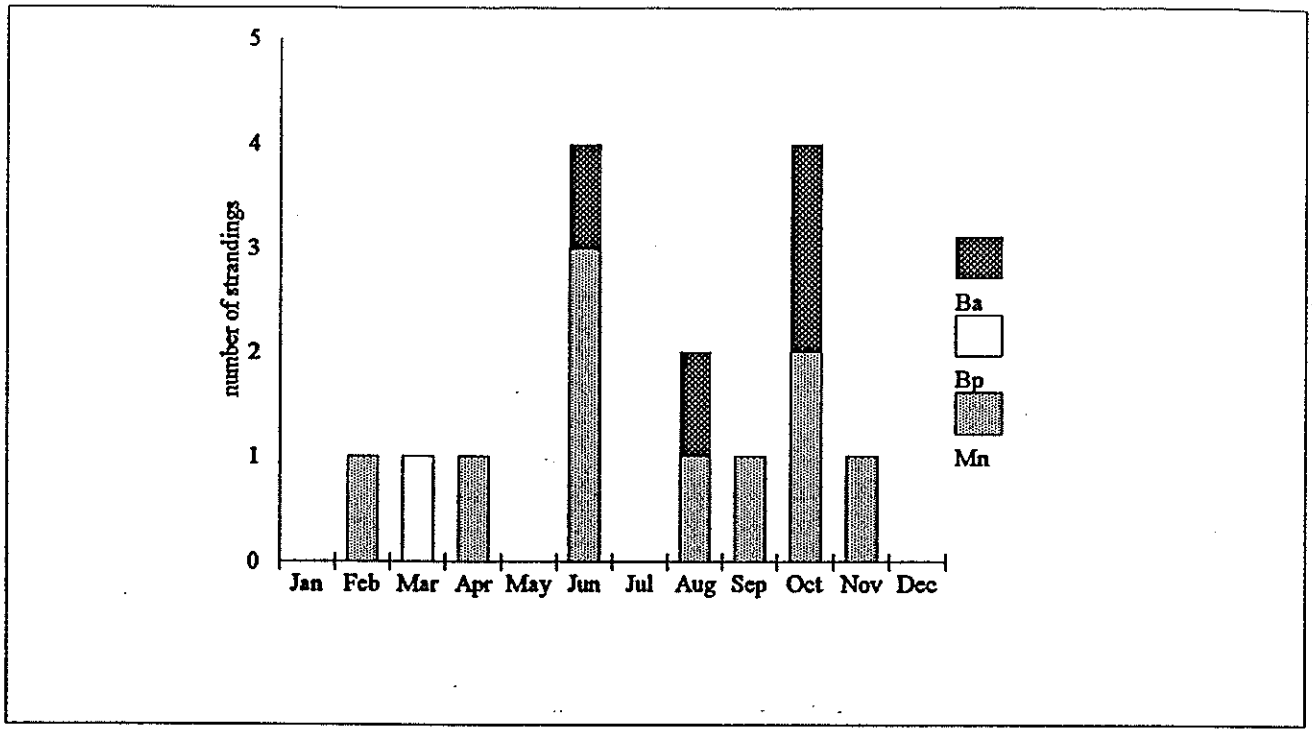
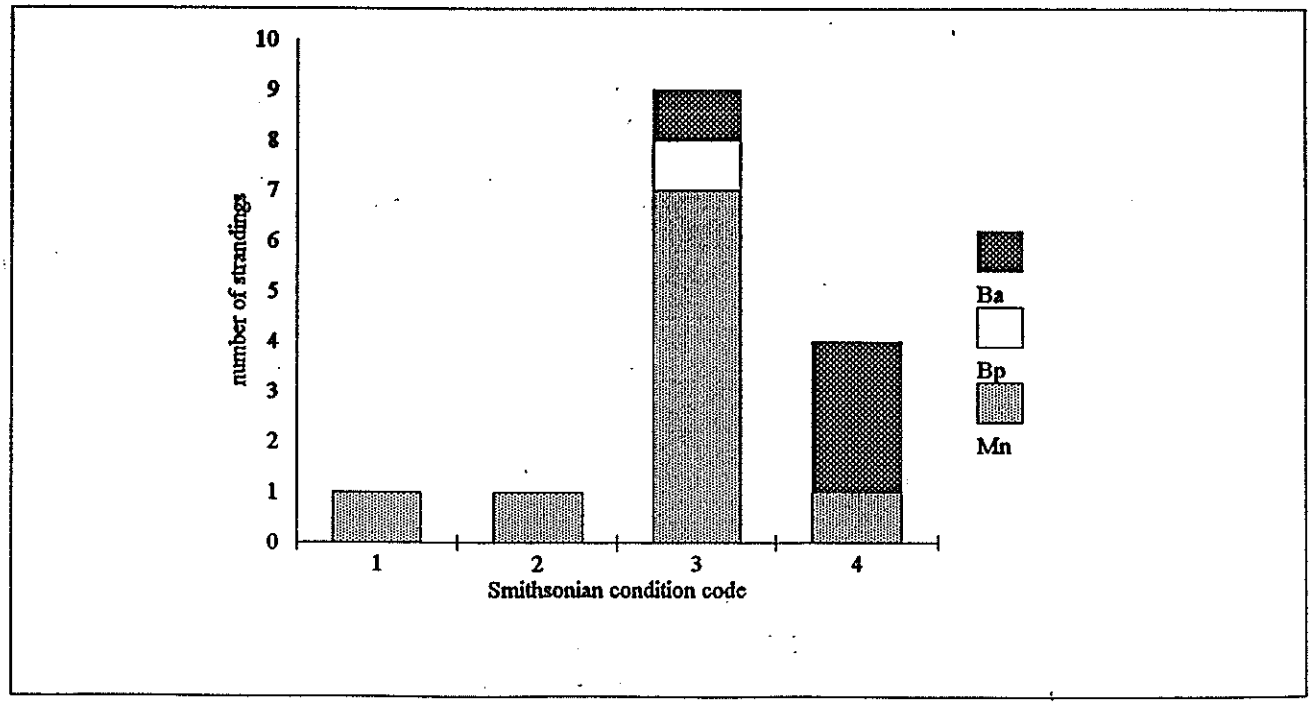


Figure 12. Condition of Stranded Whales in Virginia, 1990 - September 1995.



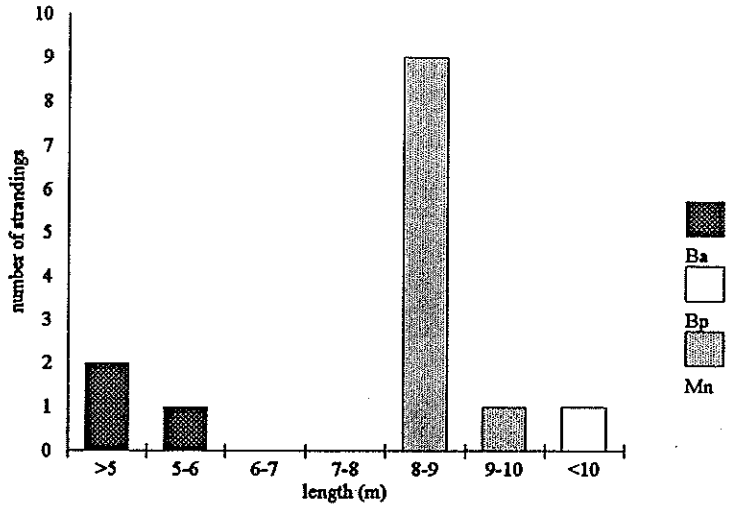


Figure 13. Length of Stranded Whales in Virginia, 1990 - September 1995.

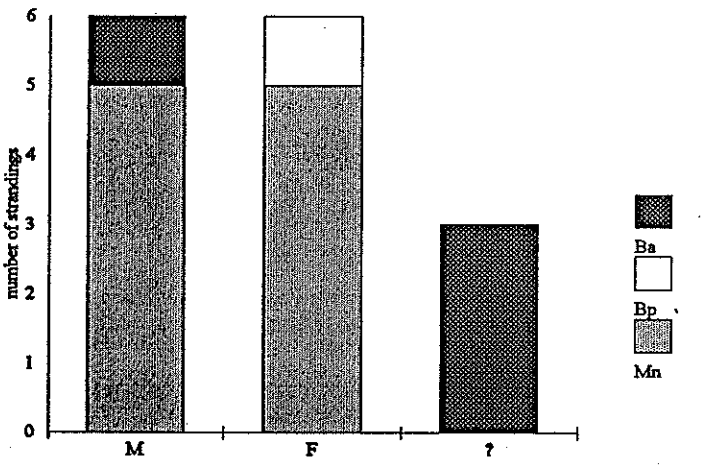


Figure 14. Gender of Stranded Large Whales in Virginia, 1990 - September 1995.

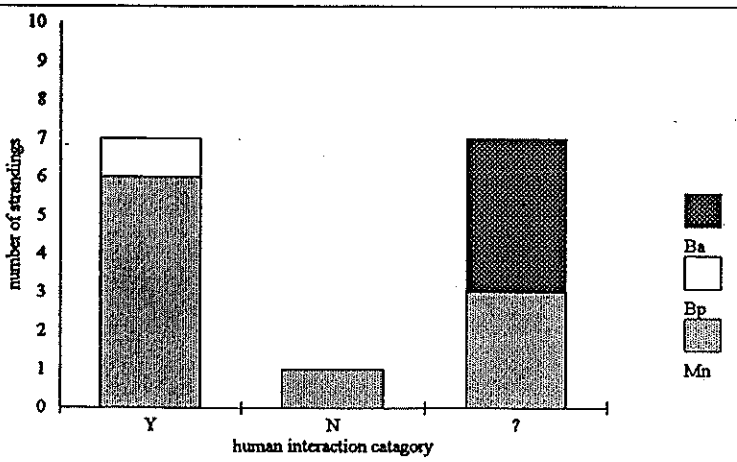


Figure 15. Evidence of Human Interaction in Virginia Whale Strandings.

Strandings of Bottlenose Dolphins and Harbor Porpoises in Virginia (1990 - 1994)[2]

by
Mark Swingle and Susan Barco, Virginia Marine Science Museum
and W.A. McLellan and D.A. Pabst, James Madison University

Recorded strandings of bottlenose dolphins, *Tursiops truncatus,* and harbor porpoises, *Phocoena phocoena,* increased in Virginia in 1990 to 1994. The Virginia Marine Science Museum (VMSM) directs the marine mammal stranding network in VIrginia and maintains a database of stranding records. Data was collected from each stranding and recorded on National Marine Fisheries Service (NMFS) Marine Mammal stranding reports. Necropsies were performed on all stranded *Tursiops* and *Phocoena* of suitable condition for internal examination. Stranding records for each species were analyzed to determine:

- monthly and yearly stranding frequencies
- size and sex ratios
- geographic distribution
- evidence of human interaction

The effect of observer effort and its relation to stranding trends were also examined.

Tursiops Strandings in Virginia

A total of 133 *Tursiops* strandings were recorded during the five year period. The stranding data indicate that *Tursiops* strandings have been increasing in recent years (Figure 16). *Tursiops* strandings occurred in all months except December during the five year period (Figure 17). Strandings peaked from May to October, coinciding with the seasonal presence of coastal migratory *Tursiops* (Barco, Pabst, Swingle 1995). From distinctive morphometrics and parasite load (Mead and Potter 1990), we believe that most strandings occurring outside of this season represent individuals from the offshore stock of *Tursiops* which may be present throughout the stranding record.

Male *Tursiops* (65 percent) stranded nearly twice as often as females (35 percent) during the study period (Figure 18). When stranded Tursiops were divided by length/reproductive class, males were dominant in each class (Figure 19). The three classes were: (1) young-of-the-year

[2] The original citation for this report is: Swingle, W.M., S.G. Barco, W.A. McLellan and D.A. Pabst. (in press). Strandings of bottlenose dolphin and harbor porpoises in Virginia (1990-1994). Proceedings of the Northeast Regional Stranding Network Meeting. Riverside, NY. April 28-30, 1995.

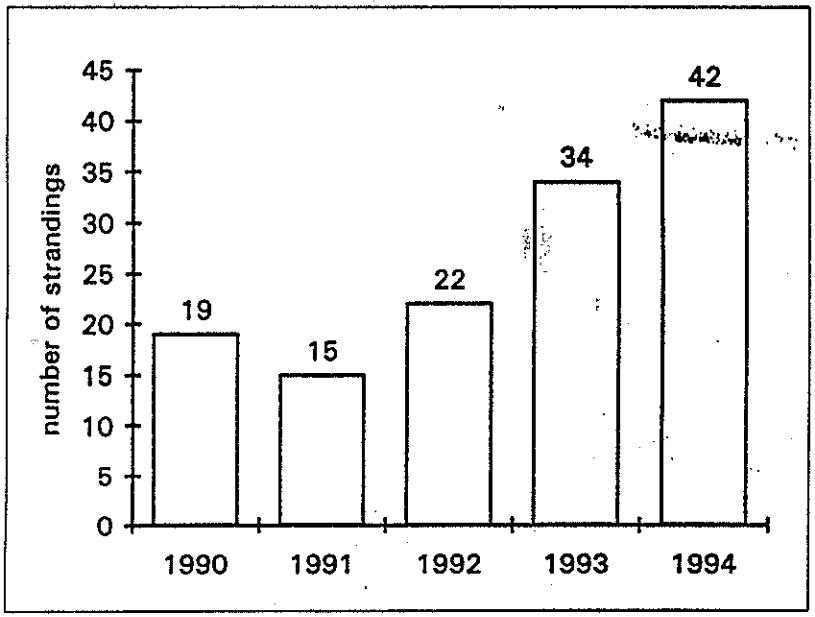


Figure 16. Yearly Frequency of Stranded *Tursiops* in Virginia, 1990 - 1994.

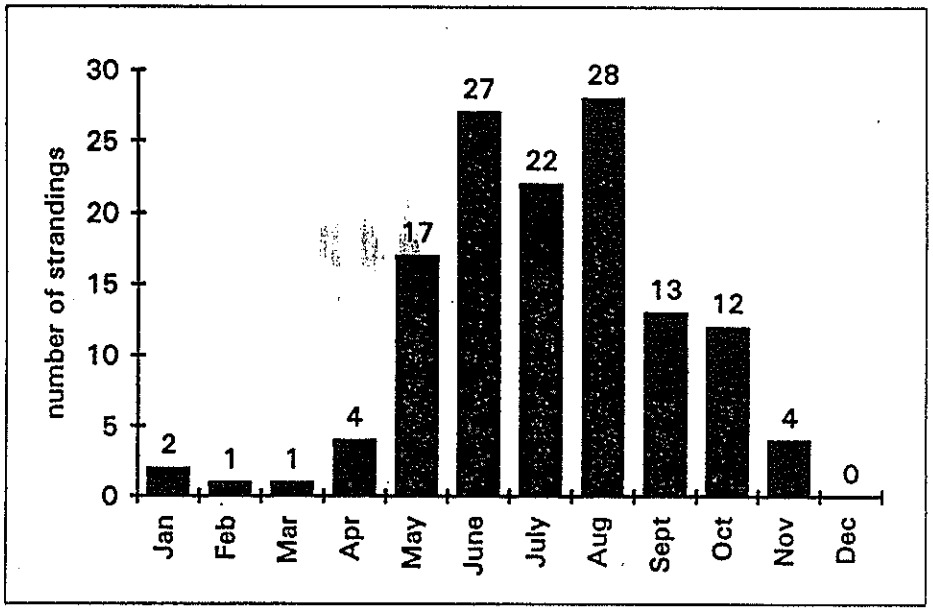


Figure 17. Monthly Frequency of Stranded *Tursiops* in Virginia, 1990 - 1994.

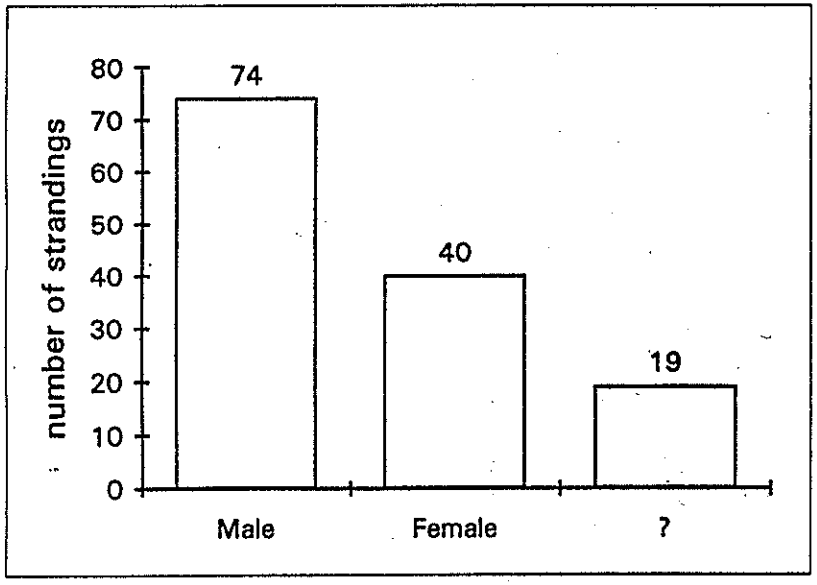


Figure 18. Sex Ratio of Stranded *Tursiops* in Virginia, 1990 - 1994.

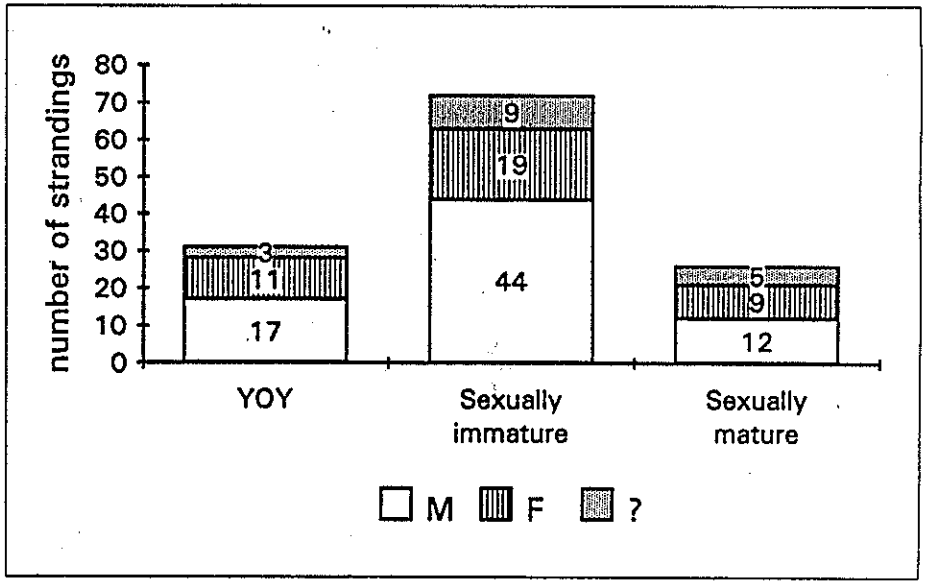


Figure 19. Length/Reproductive Class of Stranded *Tursiops*, 1990 - 1994 (Mead and Potter, 1990).

(YOY), defined as animals with a total length of 150 cm or less; (2) sexually immature, between 150 and 236 cm for females and between 150 and 248 cm for males; and (3) sexually mature, 236 cm or more for females and 248 cm or more for males (Mead and Potter 1990). *Tursiops* strandings occurred throughout Virginia on estuarine and ocean coasts. The majority of strandings (51 percent) occurred along the southern coast of the state in the city of Virginia Beach. The Chesapeake Bay area accounted for 28 percent and the northern ocean coast for 22 percent (Figure 20).

Evidence of human interaction was examined from data on the NMFS stranding reports from 1993 and 1994 (Figure 21). These years were chosen because VMSM staff examined nearly all stranded animals and consistently recorded human interaction data. Condition 2 and 3 carcasses were included in the analysis. The results were grouped into three categories: **Yes** and **No**, and **?**. **Y** indicated that there was evidence of human interaction. Evidence of human interactions were apparently fisheries related and included signs of net or rope marks, attached gear, and associated mutilations. **N** indicated that cause of death was not related to human interaction. These animals were diseased or injured and bore no evidence of human interaction. For some animals (**?** category) evidence of human interaction could not be determined. Of the 55 *Tursiops* represented in Figure 21, 33 percent showed evidence of human interaction, 22 percent had no evidence of human interaction, and no determination could be made in the remaining 45 percent. Even with the large percentage of unresolved mortalities, fisheries interactions were a major factor in Virginia *Tursiops* strandings in 1993 and 1994.

Lastly, we examined the effect of stranding response effort on *Tursiops* stranding trends. We chose two coastal areas of Virginia, the city of Virginia Beach and Chincoteague Natioanl Wildlife Refuge, where the effort had been consistent during the five year period. The results demonstrated that Tursiops strandings were steadily increasing in areas of consistent effort (Figure 22).

***Phocoena* Strandings in Virginia**

A total of 82 *Phocoena* strandings were recorded during the five year period from 1990 to 1994. Yearly stranding frequency for total numbers of *Phocoena* indicate that strandings increased dramatically in recent years (Figure 23). *Phocoena* stranded only in the months of January to June with peaks from March to May (Figure 24). When monthly stranding frequency was examined by year, a shift toward April and May was evident in 1993 and 1994 (Figure 25).

Males (54 percent) and females (46 percent) stranded in similar numbers during the five year period (Figure 26). The length distribution of stranded *Phocoena* indicates a very restricted length/reproductive class strands in Virginia. At a mean of 116 plus or minus 10 cm (Figure 27), these *Phocoena* are primarily newly weaned, immature animals (Read 1990). *Phocoena* strandings occurred almost exclusively on the ocean coast of Virginia (Figure 28). The majority of strandings (63 percent) occurred in Virginia Beach, while the northern ocean coast accounted

Figure 20. Distribution of *Tursiops* Strandings in Virginia, 1990 - 1994.

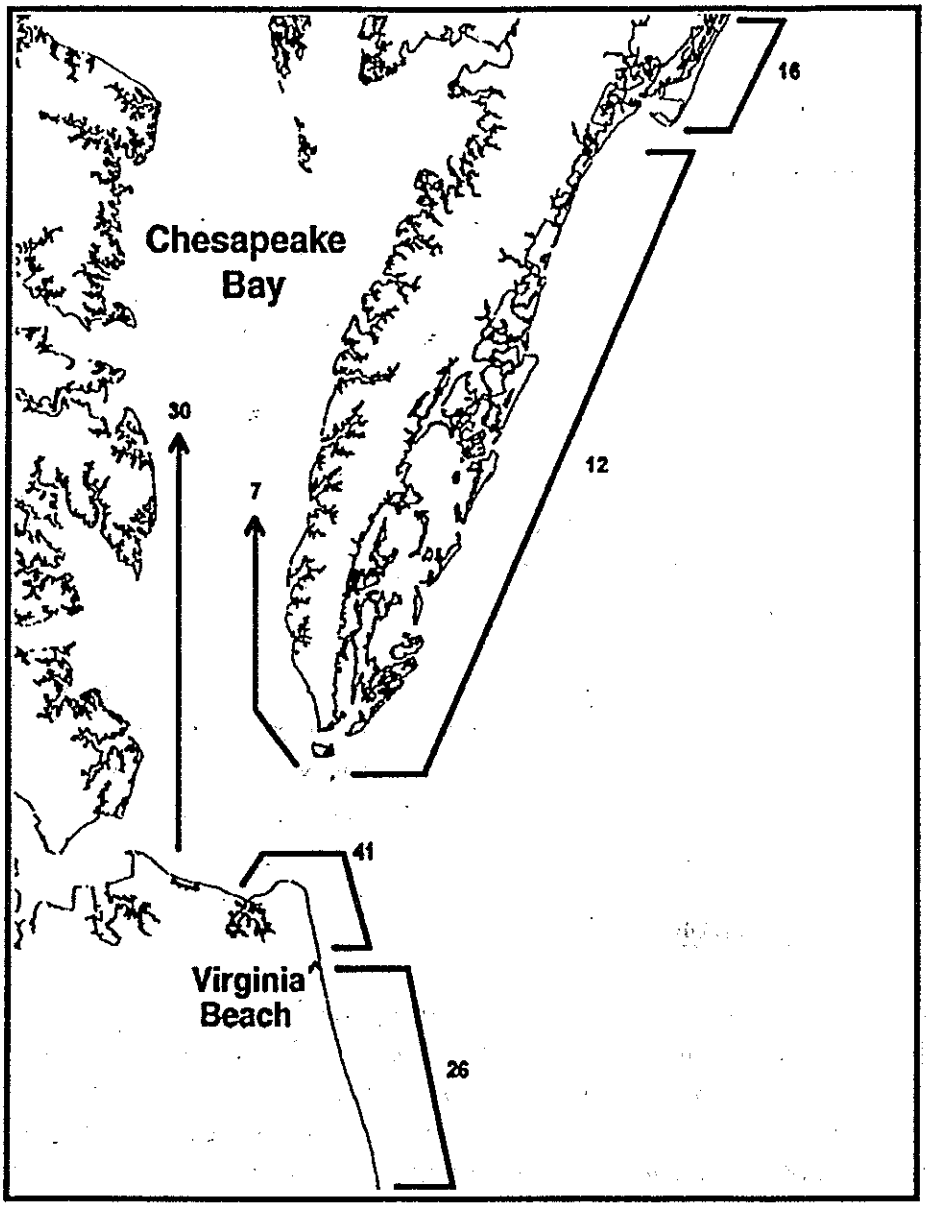


Figure 21. Evidence of Human Interaction in Stranded *Tursiops* in 1993 and 1994 (S.I. condition 2 & 3). Human interaction categories were taken from the NMFS Marine Mammal Stranding data sheet.

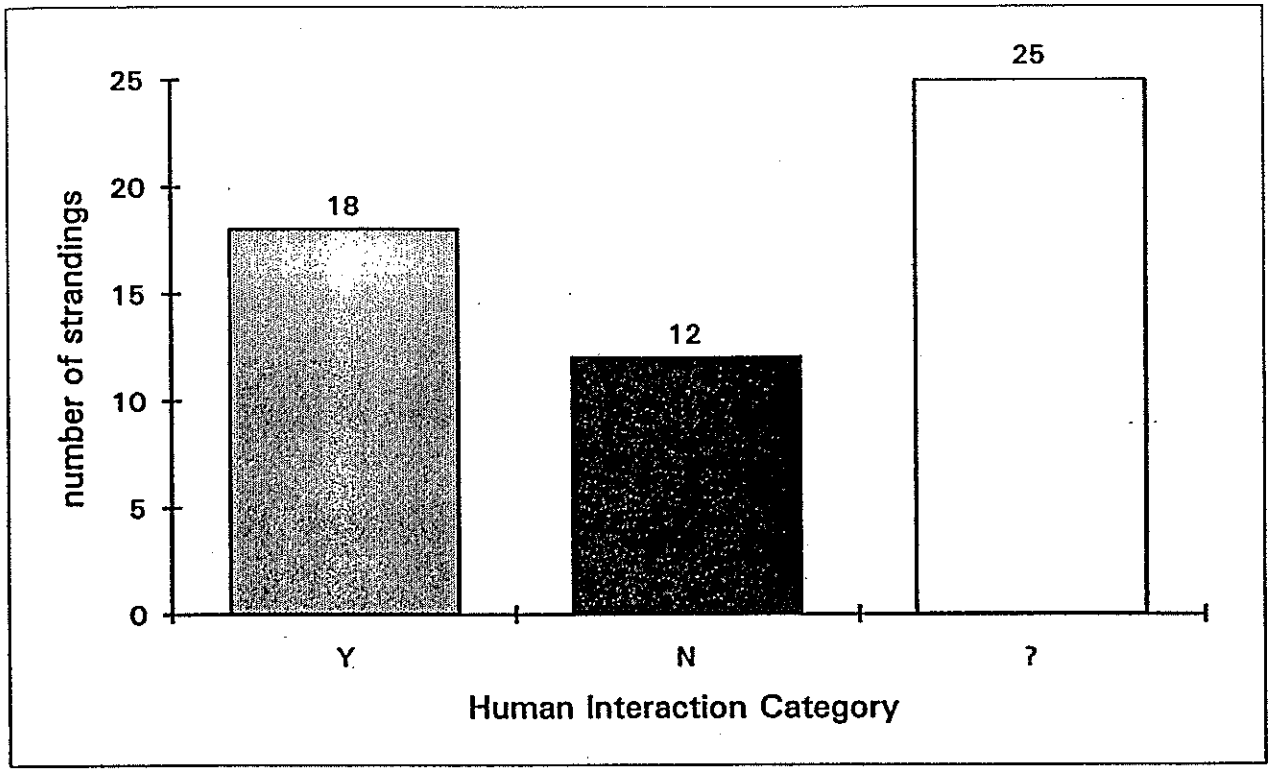
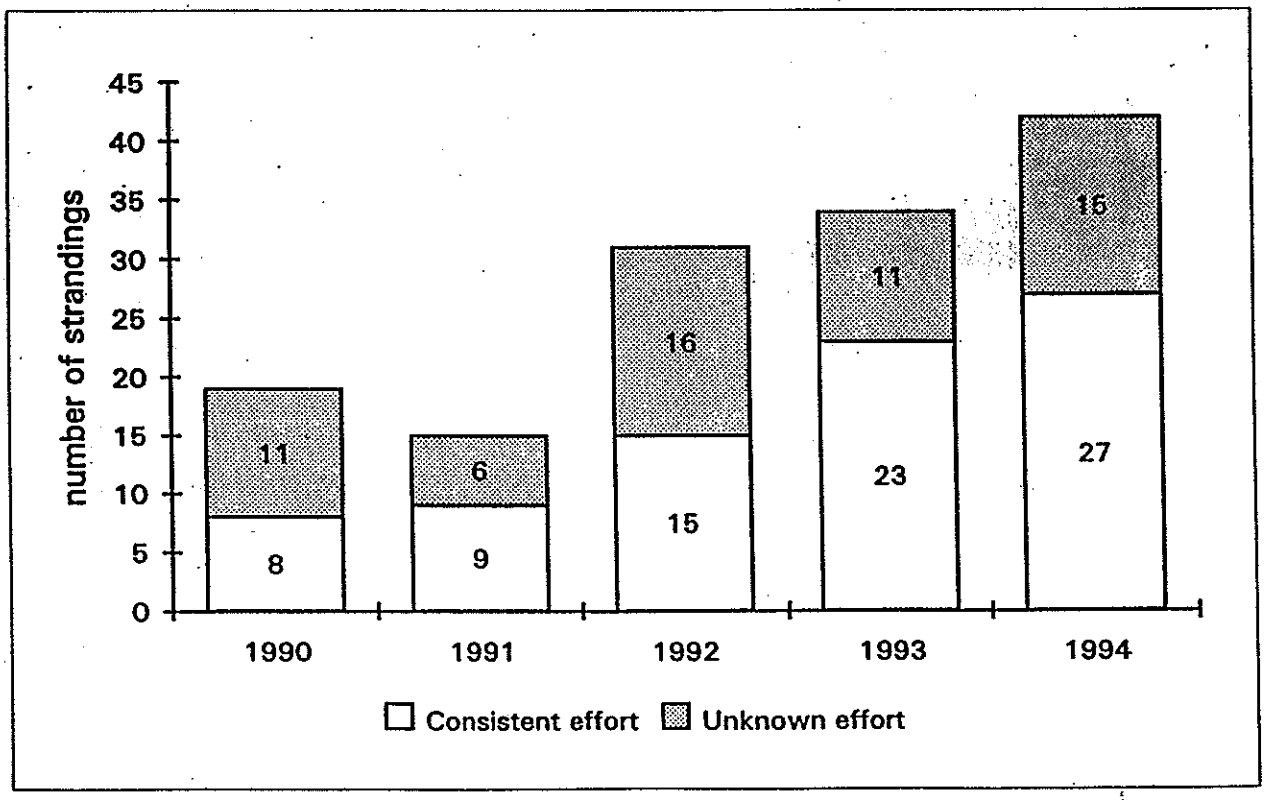


Figure 22. A Test of Stranding Response Effort for Stranded *Tursiops* in Virginia, 1990 - 1994.



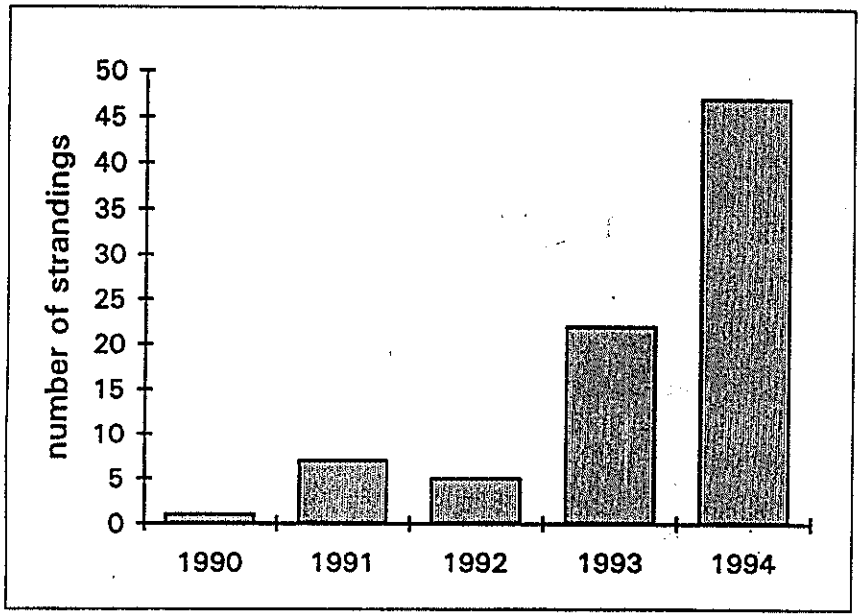


Figure 23. Yearly Frequency of Stranded *Phocoena* in Virginia, 1990 - 1994.

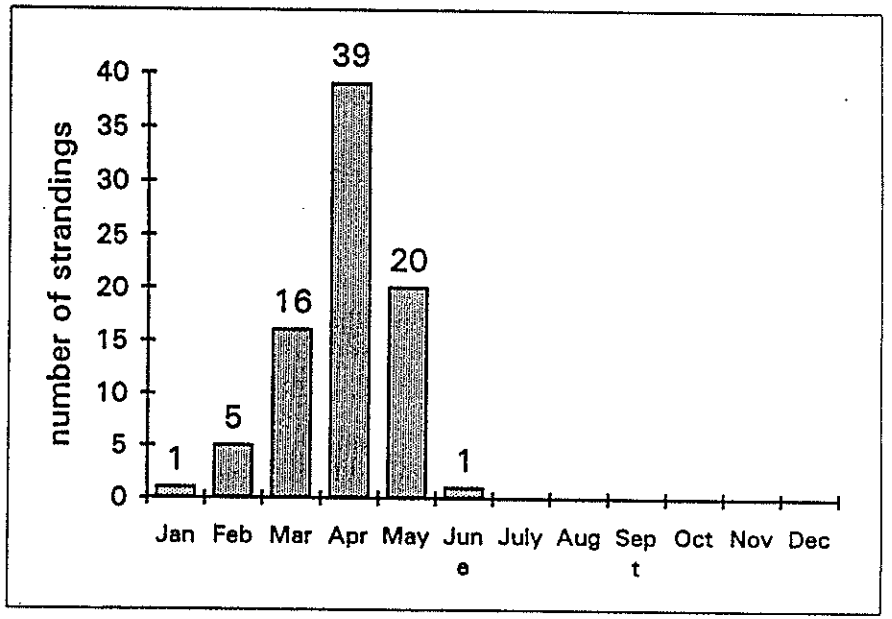


Figure 24. Monthly Frequency of Stranded *Phocoena* in Virginia, 1990 - 1994.

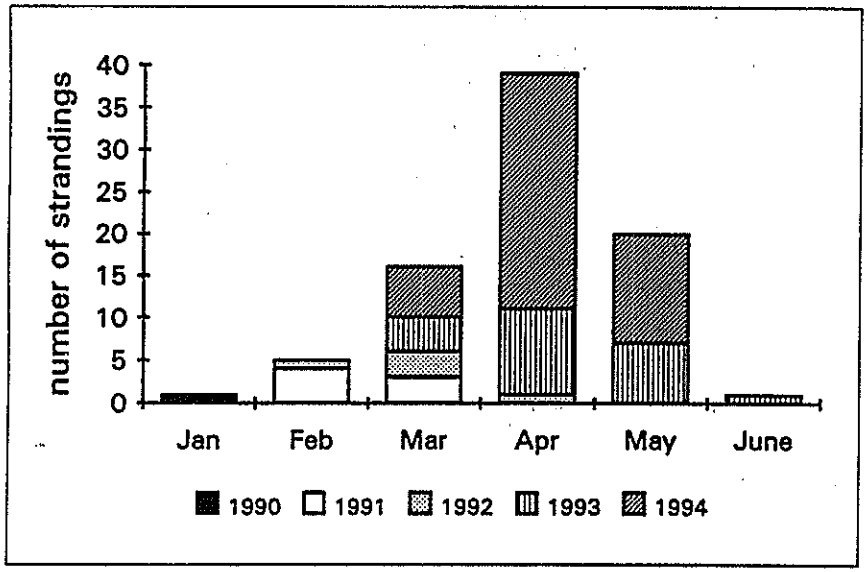


Figure 25. Monthly Frequency by Year of Stranded *Phocoena* in Virginia, 1990 - 1994 .

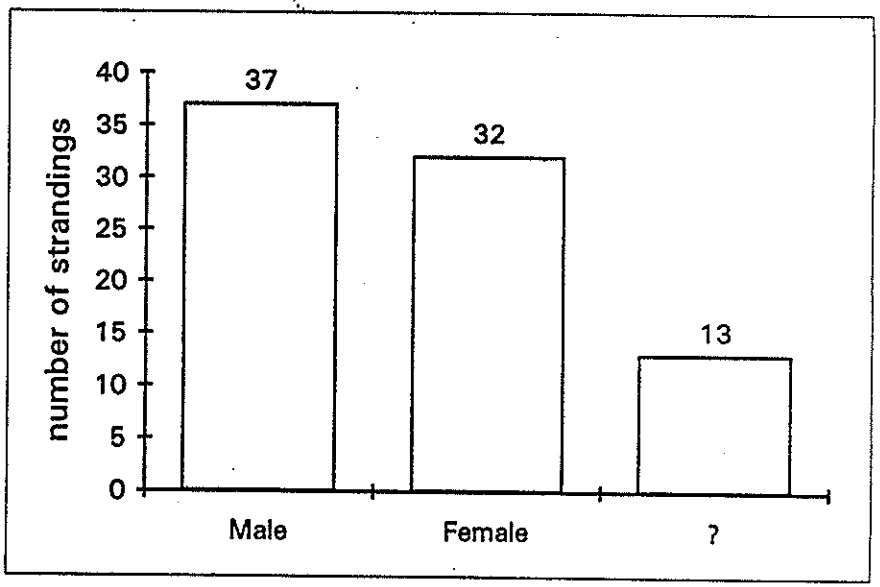


Figure 26. Sex Ratio of Stranded *Phocoena* in Virginia, 1990 - 1994.

Figure 27. Length Distribution of Stranded Phocoena in Virginia, 1990 - 1994.

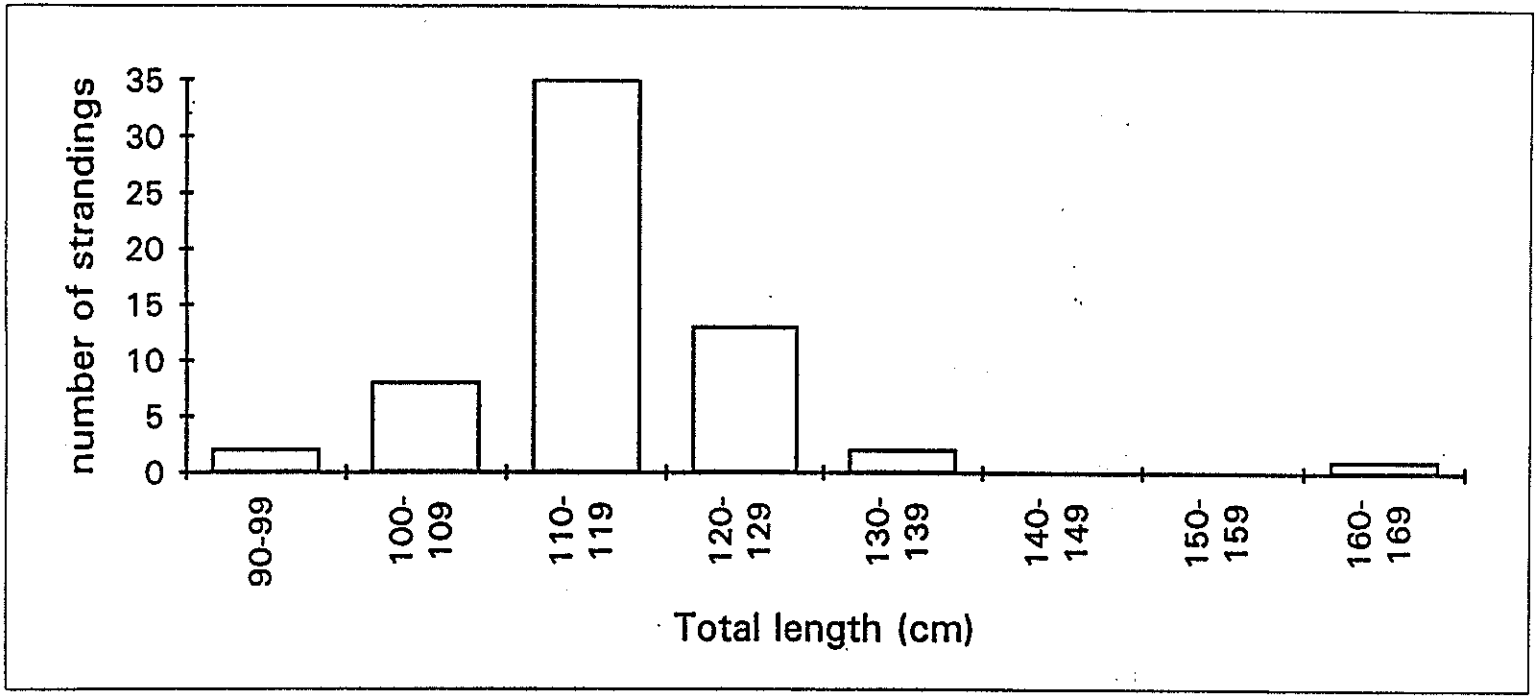
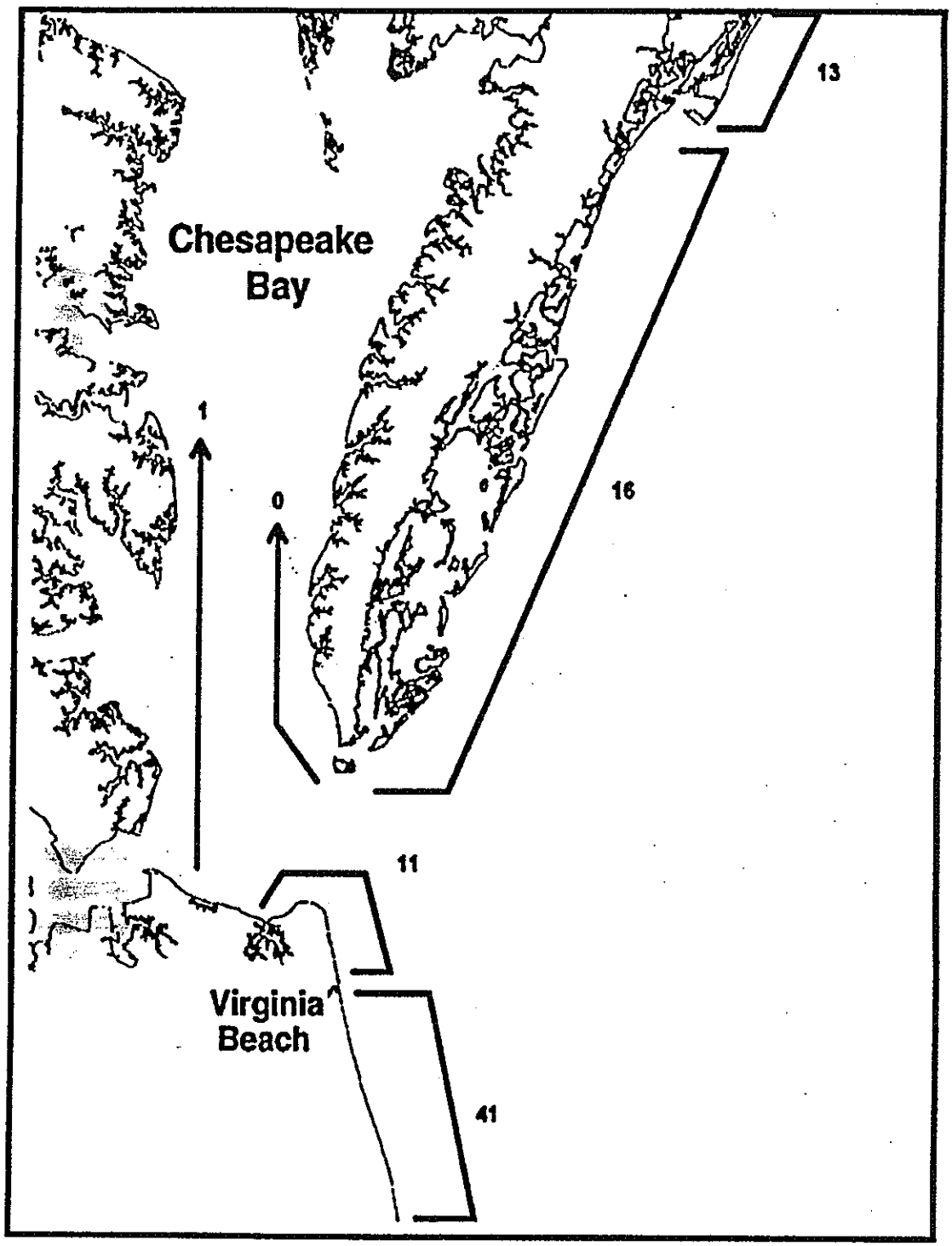


Figure 28. Distribution of *Phocoena* Strandings in Virginia, 1990 - 1994.



for nearly all remaining numbers (36 percent). Only one animal stranded in the bay and it was very close to the Chesapeake Bay mouth.

Evidence of human interaction, particularly fishery interaction, was examined from NMFS stranding reports from 1993 and 1994 (Figure 29). In addition to VMSM field notes, *Phocoena* carcasses from these years were rigorously examined by a scientific team at the Smithsonian Institution (Haley and Read 1993). Of the 39 *Phocoena* represented in Figure 29, 56 percent showed clear evidence of human interaction, five percent showed no evidence of interaction, and 39 percent could not be determined. Clearly, fisheries interactions were a major factor associated with Virginia *Phocoena* strandings in 1993 and 1994.

We examined the effect of stranding response effort on the recorded *Phocoena* stranding trends. Using the same coastal areas described in the *Tursiops* section, the results showed *Phocoena* strandings increased dramatically in areas of consistent effort (Figure 30).

Uses of Stranding Data

Data collected by regional stranding networks are critical to the long term health assessment of marine mammal stocks such as *Tursiops* and *Phocoena*. Coastal migratory *Tursiops* have recently been listed as a depleted stock (Wang, Payne, Thayer 1994). Likewise, *Phocoena* stocks may be severely threatened in the western north Atlantic (NMFS, 1993). Stranding records from VIrginia indicate that *Tursiops* and *Phocoena* are increasing and that a large proportion of the mortalities are fisheries related. Stranding records provide excellent data on the length/reproductive class and sex of stranded animals. Geographic distribution of *Tursiops* and *Phocoena* strandings in Virginia can be very accurately plotted and displayed graphically. In the case of *Tursiops*, distribution, abundance and ecology of the animals has been well studied in Virginia in recent years (Barco et al. 1995; Swingle, Barco, McLellan 1993). We know that areas of the coast where consistently high numbers of *Tursiops* are observed are also the areas with the highest numbers of stranded animals. In contrast, very little data exist on the abundance and distribution of *Phocoena* in Virginia. Virtually, the only records of *Phocoena* presence are those of stranded animals. In areas with consistent observer effort, stranding data indicate that these two species are experiencing increasing levels of mortality.

What can now be done with these data from a management perspective? Stranding data strongly suggest that fisheries interactions are a major factor in *Tursiops* and *Phocoena* mortalities in Virginia; however, mandatory reporting of incidental takes for these two species are negligible. Thus, accurate assessment of the true impacts to these stocks will require a thorough and detailed analysis of the fisheries themselves. Analysis of fisheries data that includes improved measures of effort, temporal and spatial distributions, and descriptions of methods and gear types are necessary to accurately identify real and/or potential conflicts with these and other protected species.

Figure 29. Evidence of Human Interaction in Stranded *Phocoena*, 1993 - 1994.

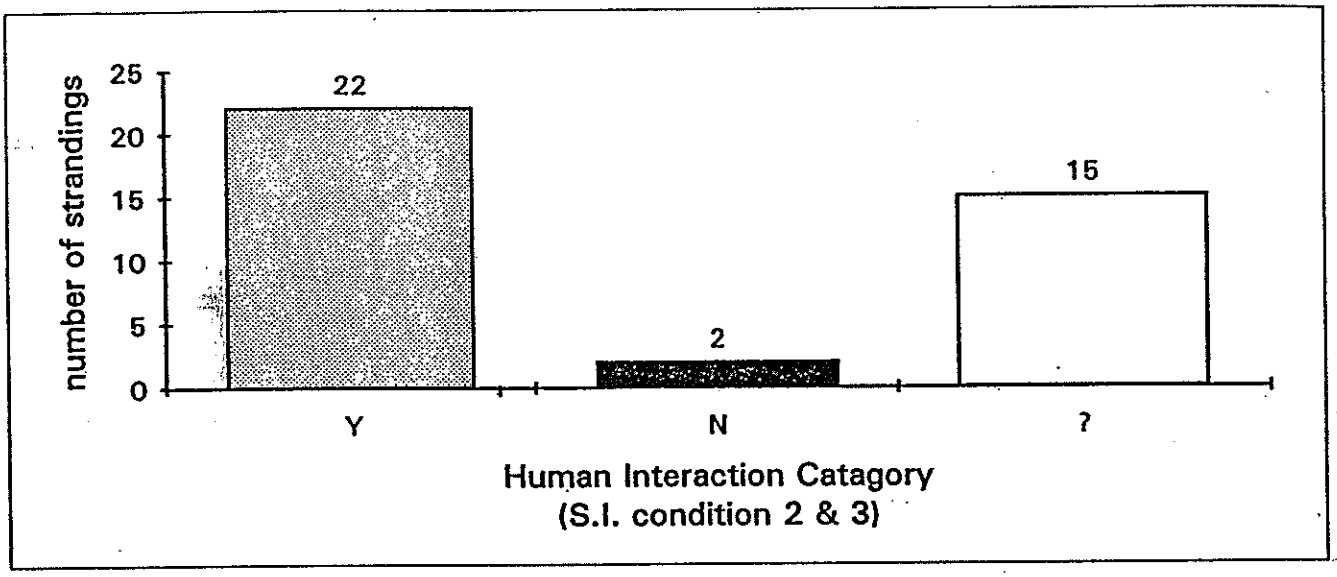
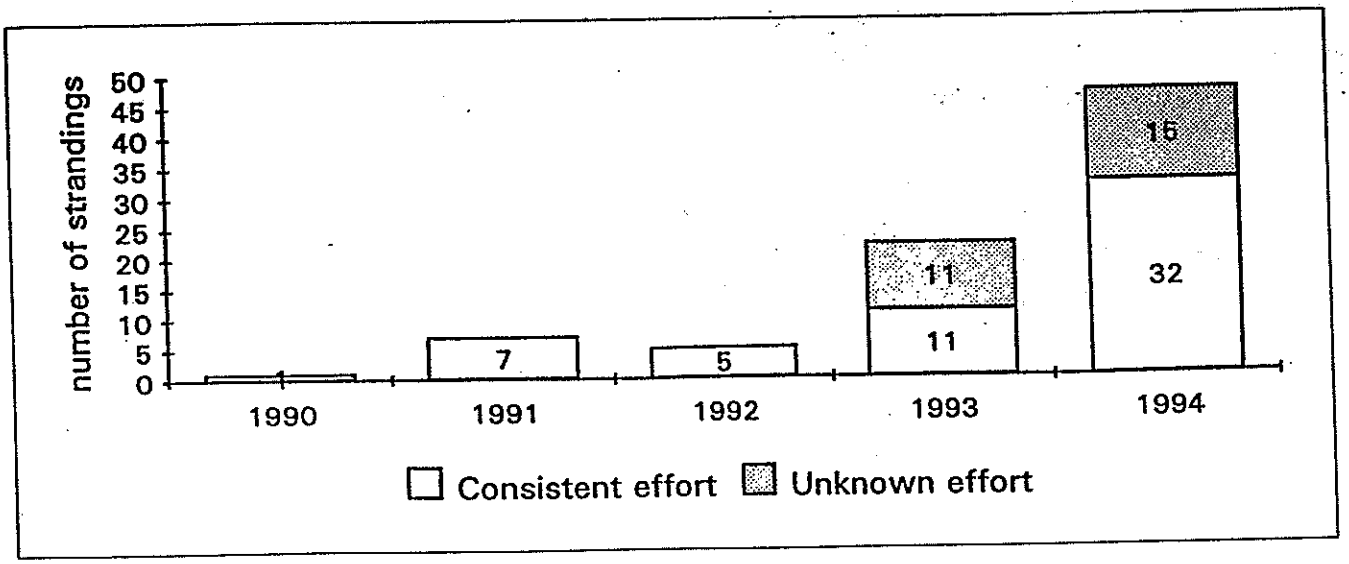


Figure 30. A Test of Stranding Response Effort for Stranded *Phocoena*, 1990 - 1994.



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Acknowledgements

We would like to thank the Virginia Marine Science Museum Foundation and the VMSM Stranding Team for their support. Special thanks to Sean Bourgeois for data compilation and analysis. The following institutions also provided information and/or support: James Madison University, Smithsonian Institution Division of Marine Mammals, Virginia Institute of Marine Science, Maryland DNR, National Aquarium in Baltimore.

Marine Mammal & Sea Turtles: Fisheries Interactions in North Carolina*

by
Sheryan P. Epperly and Victoria G. Thayer
National Marine Fisheries Service
Southeast Fisheries Science Center

My presentation is on fisheries interactions in North Carolina with sea turtles and marine mammals. There is a handout on the table out front where on the second page you will find a list of references. In that list of references all items are found except for the one in press. Any graphics that I am about to show that are not in any of those publications are contained in this handout itself.

I am going to organize my talk a bit differently. First, I'll discuss a little about the distribution of turtles and mammals, and also about the physical oceanography that somehow plays a role in the distribution of these animals off of North Carolina and in the southeast. In addition, I will discuss stranding mammals, sea turtle strandings and lastly, about interactions by gear.

My colleagues Colleen and Laurie suggested one of the approaches, perhaps, the Atlantic States Marine Fisheries Commission could take is to first understand the distribution of these animals and, secondly, understand the types of gears and the probability that they would take the animals, and then start putting together some management measures that could mitigate or decrease those rates of interactions. This explains why I am beginning with the distribution of the animals and concluding with the actual gears.

There are five species of sea turtles in the world. All five of them occur off the Atlantic seaboard and are under the Protected and Endangered Species Act. We do get all five off of North Carolina. After spending a period of time in the pelagic environment, the turtles will settle out to a benthic life-history stage along the Atlantic seaboard. In the inshore waters we commonly find three species: the loggerhead, the green, and the Kemp's ridley sea turtle. Leatherbacks, at least in North Carolina, infrequently enter the waters and even more infrequently do we see the hawksbill.

In the inshore waters of North Carolina, about 80 percent of our turtles are loggerheads, about 15 percent of our turtles are greens, and about 5 percent of them are Kemp's ridley turtles. After these animals recruit to the estuaries and near-shore waters of the Atlantic coast and the waters begin cooling in the fall, they migrate southward out of the temperate latitudes at least as far south as Cape Hatteras. In the spring they will again migrate, inshore and northward along the coast, repopulating those areas.

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* text edited from verbatim transcripts

This north-south distribution is corroborated by the fact that in the central Florida area we see turtles inshore all year round and offshore all year round. In the Chesapeake Bay they are inshore May through November, almost always gone in the winter time because they have migrated south. In Long Island Sound they are inshore a shorter amount of time, at most June through October.

Figure 31 shows the distribution of animals in North Carolina where we find turtles in inshore waters April through December (we have had only a couple reported in March), but we still have turtles year round offshore, including in the winter time. One thing to note about the turtles is how there are not very many sightings of them in the near-shore waters to the south of Cape Lookout nor to the north of Oregon Inlet. There is, however, a concentration here in Raleigh Bay, and I will explain why shortly.

Turtles are cold-blooded animals and their distributions are generally related to water temperature. These are the results from some aerial surveys from when we flew in the winter of 1991-1992 for a study of the winter trawl fishery for summer flounder. The sea-surface temperature is derived from AVHR imagery on NOAA-11 polar orbiting satellites. These very little turtles were sighted in waters less than 11°C., which is now the temperature we use to manage the position of the TED line in this particular fishery.

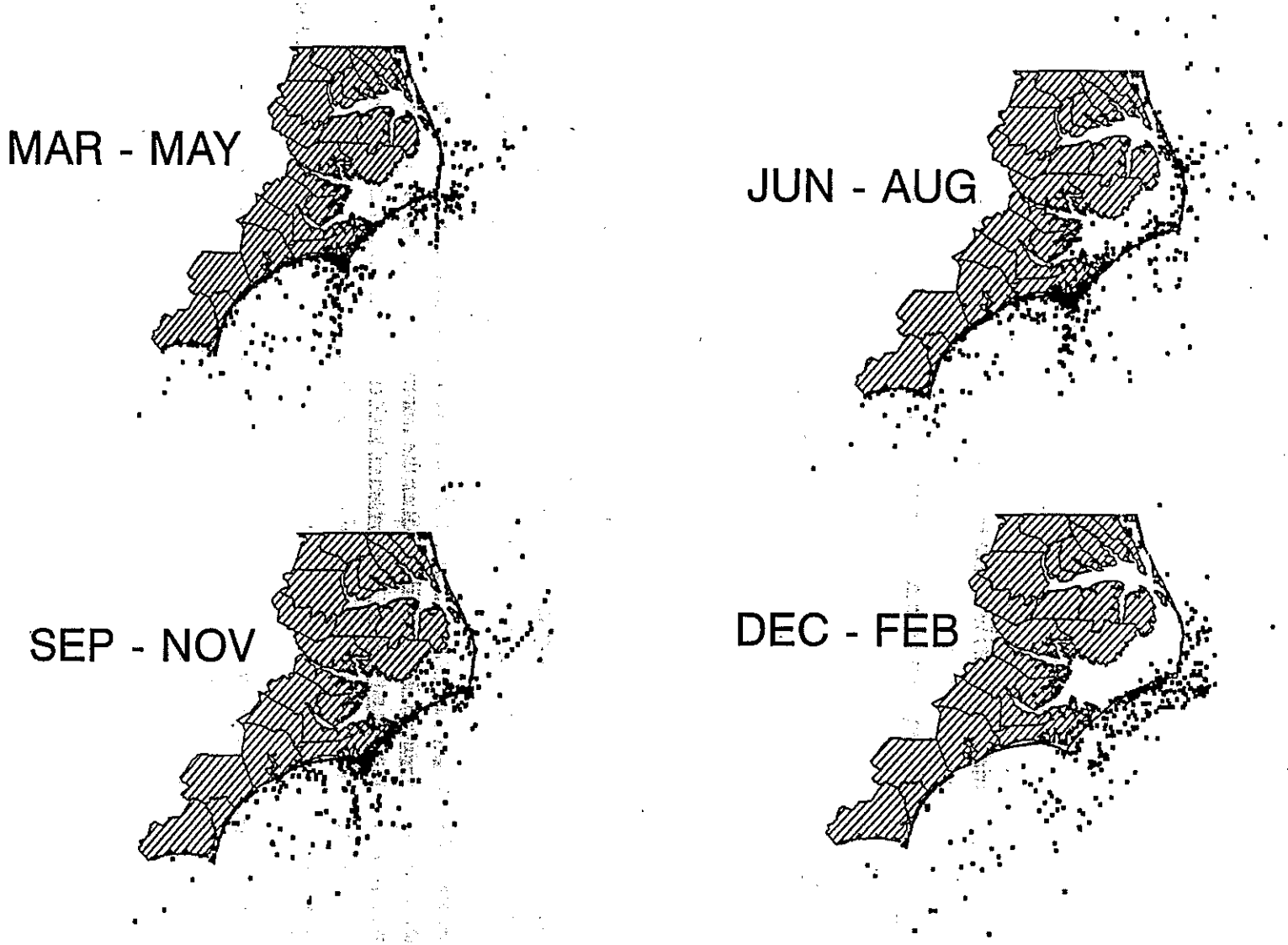
Concentrating specifically on the Raleigh Bay area, you'll notice it is characteristically much warmer in the winter time than any other area to the south, where the continental shelf is much wider. There are two episodic processes working in this area, physical processes. The first flushes warm water in and the second flushes the warm water out.

The first process is a shoreward movement of the Gulf Stream in the form of frontal eddies bringing warm water ashore. Turtles in the winter time are associated with the western wall of the Gulf Stream and these warm-water eddies bring the turtles inshore. Since the shelf is considerably narrow there, inshore is directed right to the beach in the Raleigh Bay area. In a January 21st image up as far north as Oregon Inlet, there is one turtle. Again, it is in warm water.

The second episodic process that is occurring in this area is wind. In the winter, winds from the north to northeast push the cold, low-salinity, Virginia coastal water southward around Cape Hatteras. This is the most extreme we have encountered, usually it does not get this far south, in this instance it got much farther south of Cape Lookout and we faced a fish cold-stunning episode there in Raleigh Bay.

When these winds subside, the situation is then set up so that the warm waters of the Gulf Stream move back in, this dynamic plays itself out all winter long. Today we have two fishermen here who fish that area and can attest to the fact that sometimes it can be warm or sometimes it can be cold near-shore in that area.

Figure 31. Sea Turtle Sightings, 1988 - 1994.



It is along this area influenced by Virginia coastal water that we see our great diversity of marine mammal strandings. Looking at the 1992 to 1994 marine mammal stranding data, as shown in Figure 32, pay attention to the diversity in terms of the pattern and the colors of the block, disregard the names. Our diversity is mostly north of Cape Hatteras during the winter time, and *Tursiops* is by far the most abundant animal that is seen in North Carolina (Figure 33). Harbor porpoise strand only as far south as Cape Hatteras (Figure 34).

Another species is the humpback whale as shown in Figure 35. Again, those strandings are restricted as far as Cape Lookout, with a single occurrence down off of the point at Cape Fear. That was a deceased animal found floating very far offshore.

As for the humpback whale: We have had 13 animals stranded in the same two year period of time. Since the beginning of 1995, we have added another four animals to that total. They are on the beaches December through May. Again, the average size of these animals is 837 centimeters, an animal probably less than three years old, again, a juvenile animal, probably just weaned.

Looking at the seasonal distribution of these strandings in the 1992 - 1994 period of time, we had 26 harbor porpoise strandings. They are on the beach only between February and May, and again, are only as far south as Cape Hatteras. The average size hitting the beaches in this area is 118 centimeters,which is just at weaning size of relatively small, immature animals.

We had a discussion of various things we look at when we have a marine mammal on the beach and one topic is signs of human interaction. By far, the majority of these animals are in the undetermined group. Of those that show signs of human interaction, we look at likely fishery interactions. There are two groups, one of which is mutilation. We sometimes find, for example, a dolphin whose entire belly is slit or has been cut in some way or its severed flukes of a dolphin.

The second category that we are looking for is gear, either gear that is still attached to the animal, that floats around the flukes, or gillnet over the rostrum of this animal. One important thing to stress is the net is very tight, and leaves marks and cuts in the animal. Occasionally we see animals coming ashore, without the gear on, but with clear evidence that they have been in a net. We know this from visible cuts on the animal.

If we observe all but *Tursiops*, we see that almost all of our marine mammal species are showing some percentage of interaction. This percentage, for example, of the harbor porpoise, denotes there is no determination. There is no evidence and we have about four percent of animals showing signs of interaction in the categories of mutilation or gear (Figure 36).

Again, if we add the 1995 data to the humpback whale here, the harbor porpoise are the second most abundant animal stranded in the state, now we have the humpback whale and the harbor

Figure 32. North Carolina Marine Mammal Strandings, 1992 - 1994.

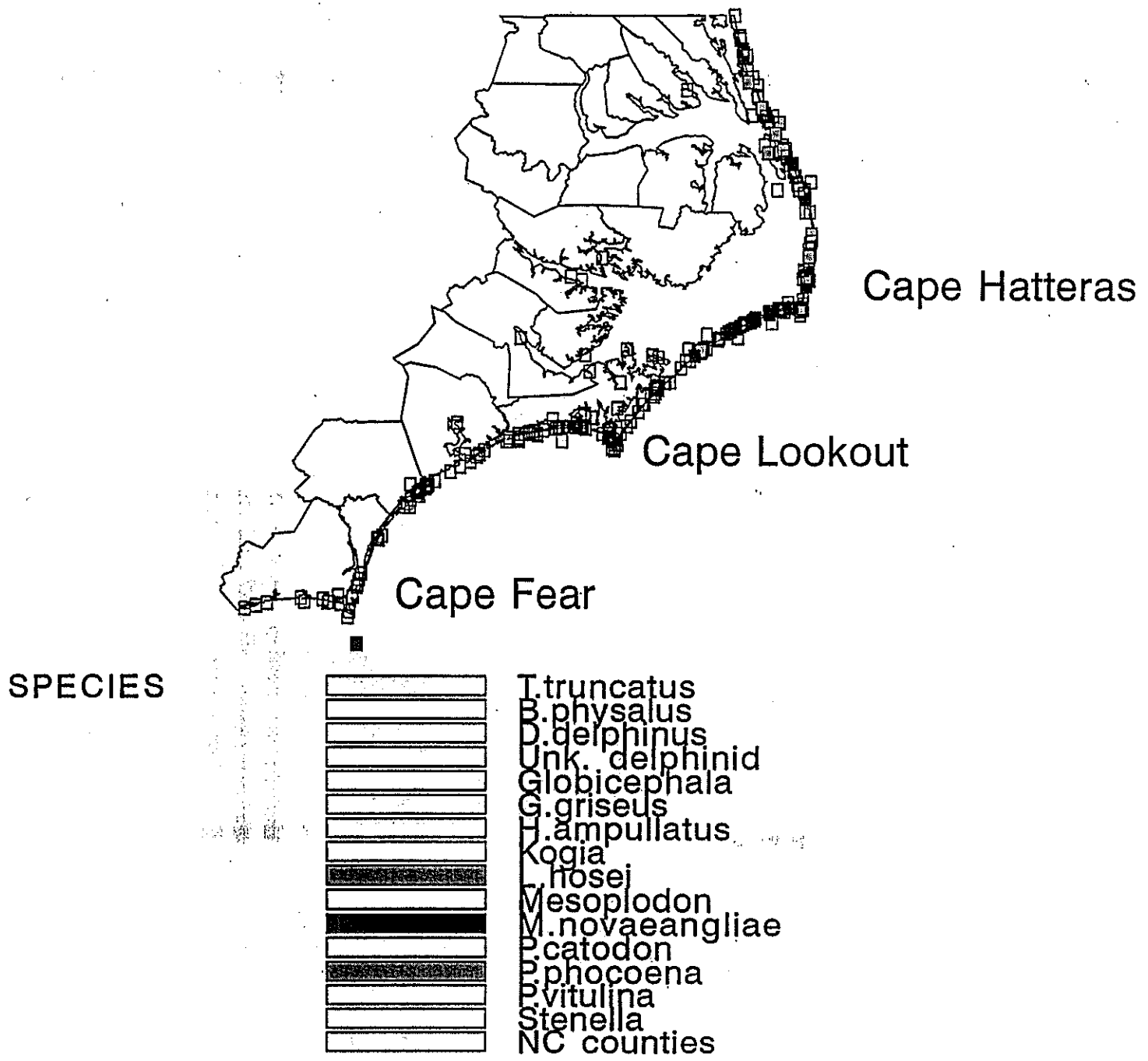


Figure 33. North Carolina Strandings, January 1992 - December 1994.

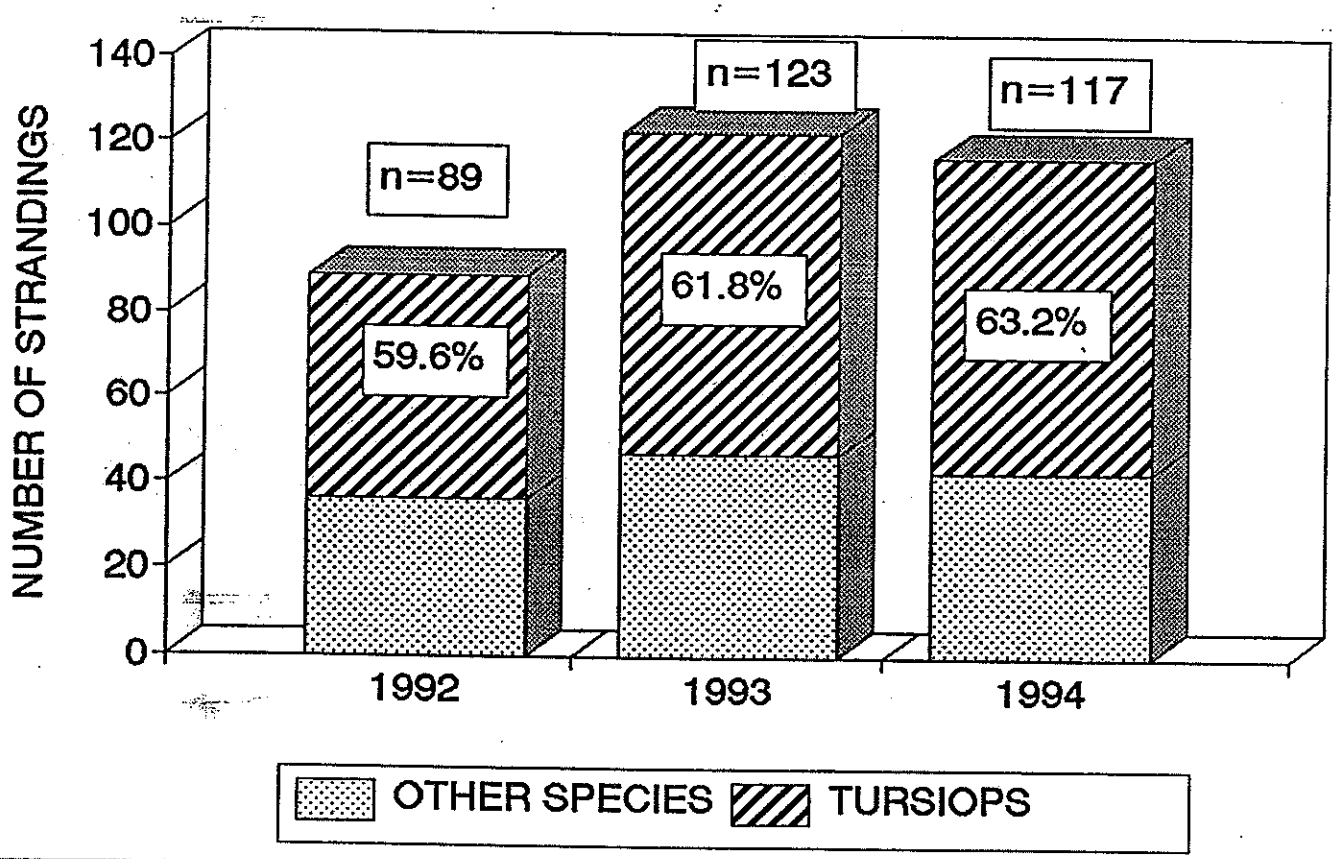


Figure 34. Harbor Porpoise Strandings, North Carolina, 1992 - 1994.

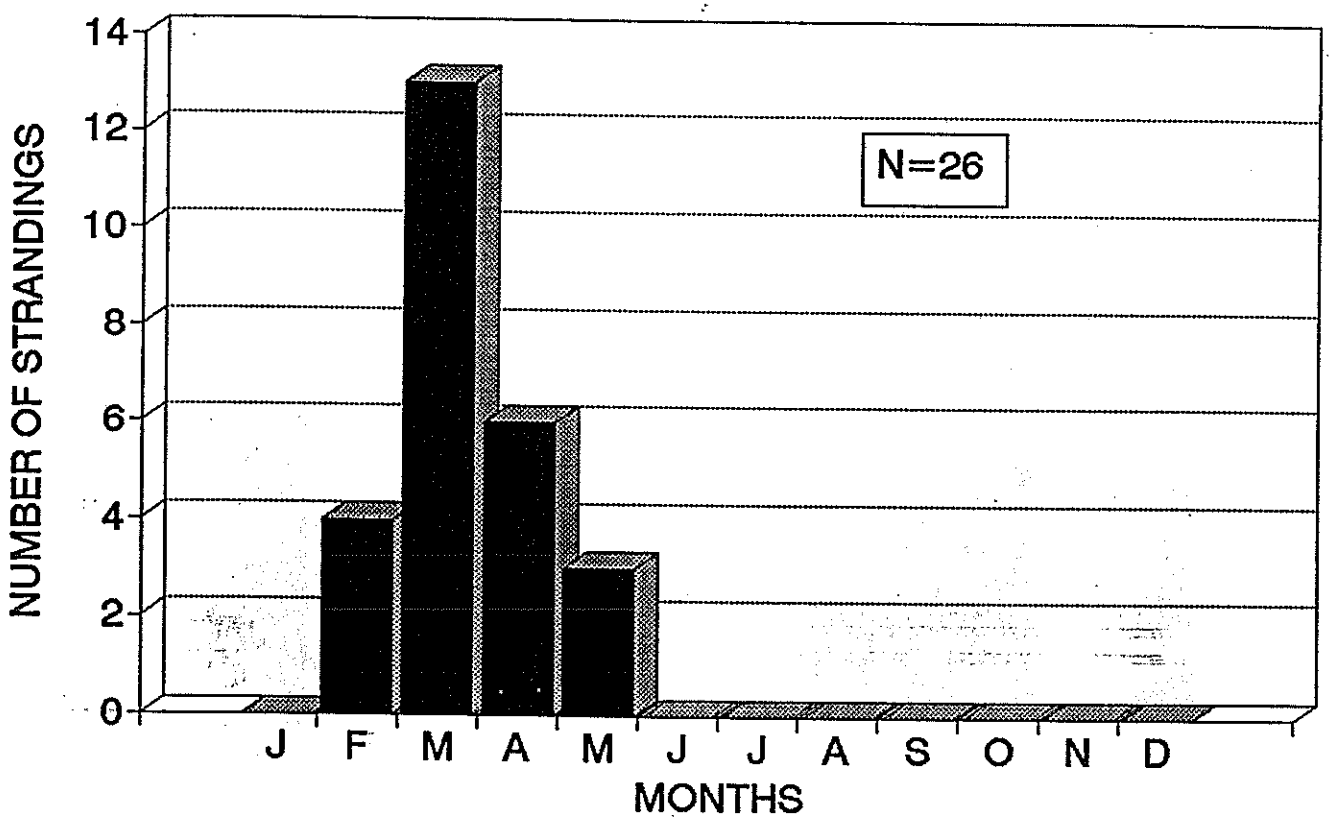


Figure 35. Humpback Whale Strandings, North Carolina, 1992 - 1994.

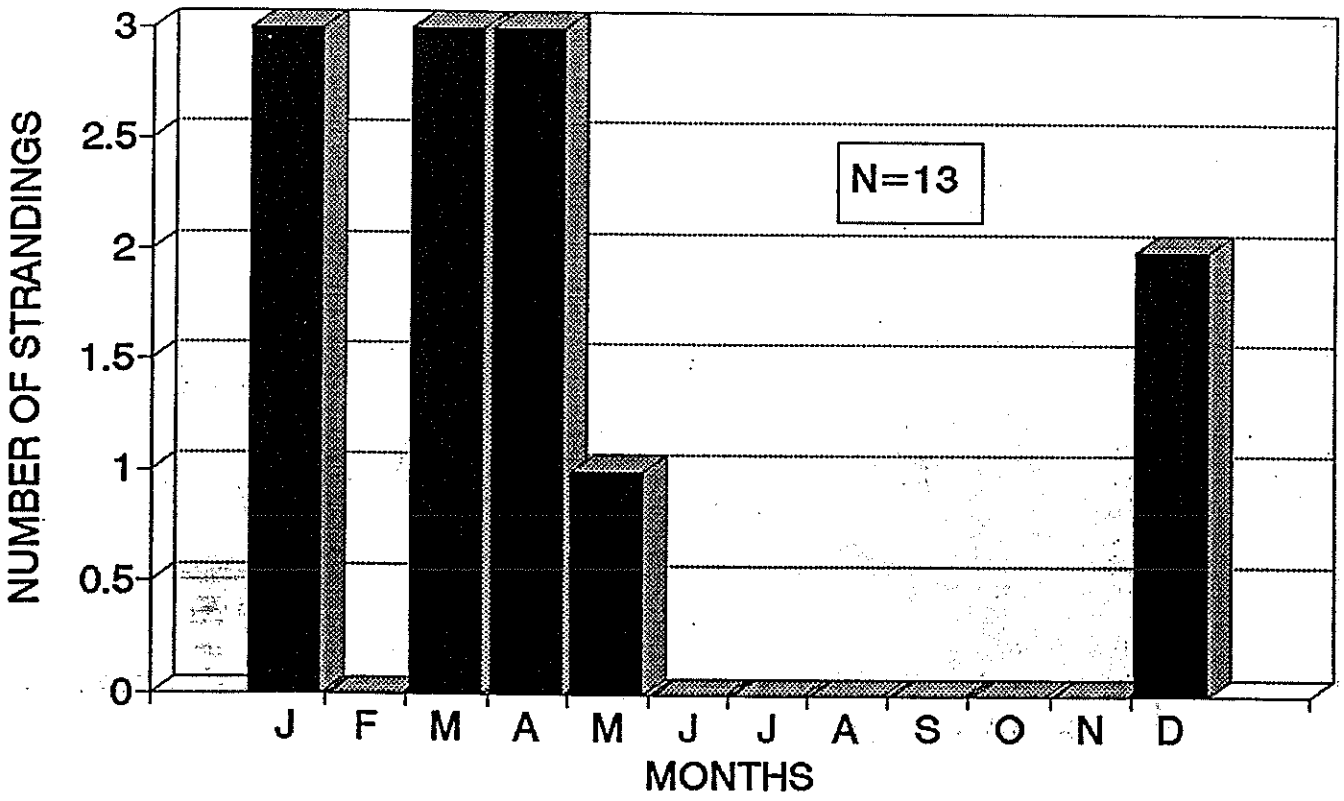
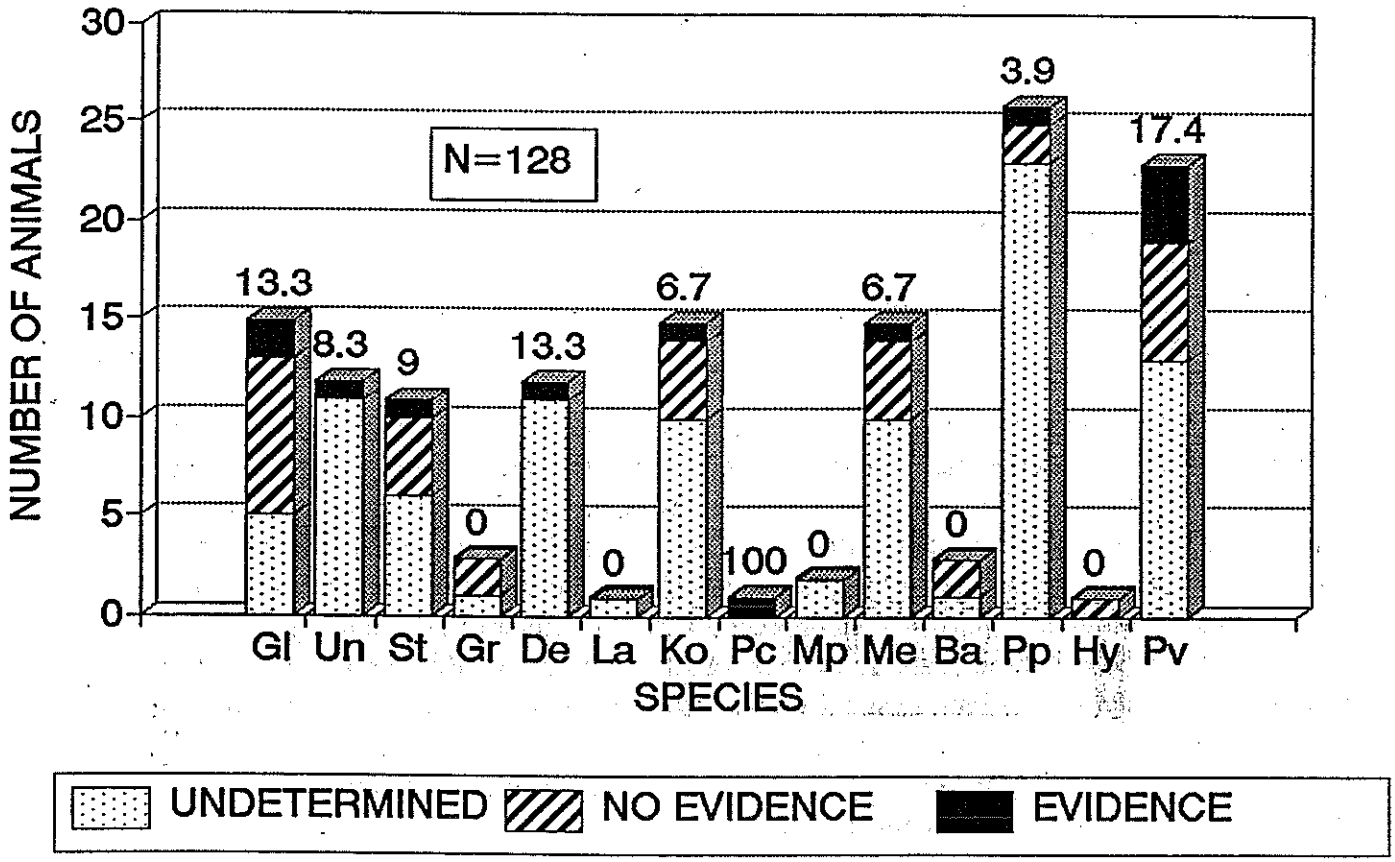


Figure 36. **Stranded Marine Mammal Species, Non-Tursiops, North Carolina, 1992 - 1994.**



seal equal in numbers after you add the spring data to it. However, the harbor seal is showing the highest percentage of interaction.

If we look at the data for just the bottlenose dolphin, we see that it is stranding all along the coast all months of the year. We have two peaks. First, we have a peak in the spring that has about 26 percent interaction. We have a smaller peak in the fall, but this interaction in the fall is double what the percentage interaction is in the spring.

The females seem to be most vulnerable to these interactions when they are about 201 to 250 centimeters -- that is probably at a size right before they are reaching maturity. The males seem to be most vulnerable to interaction while they are still calves.

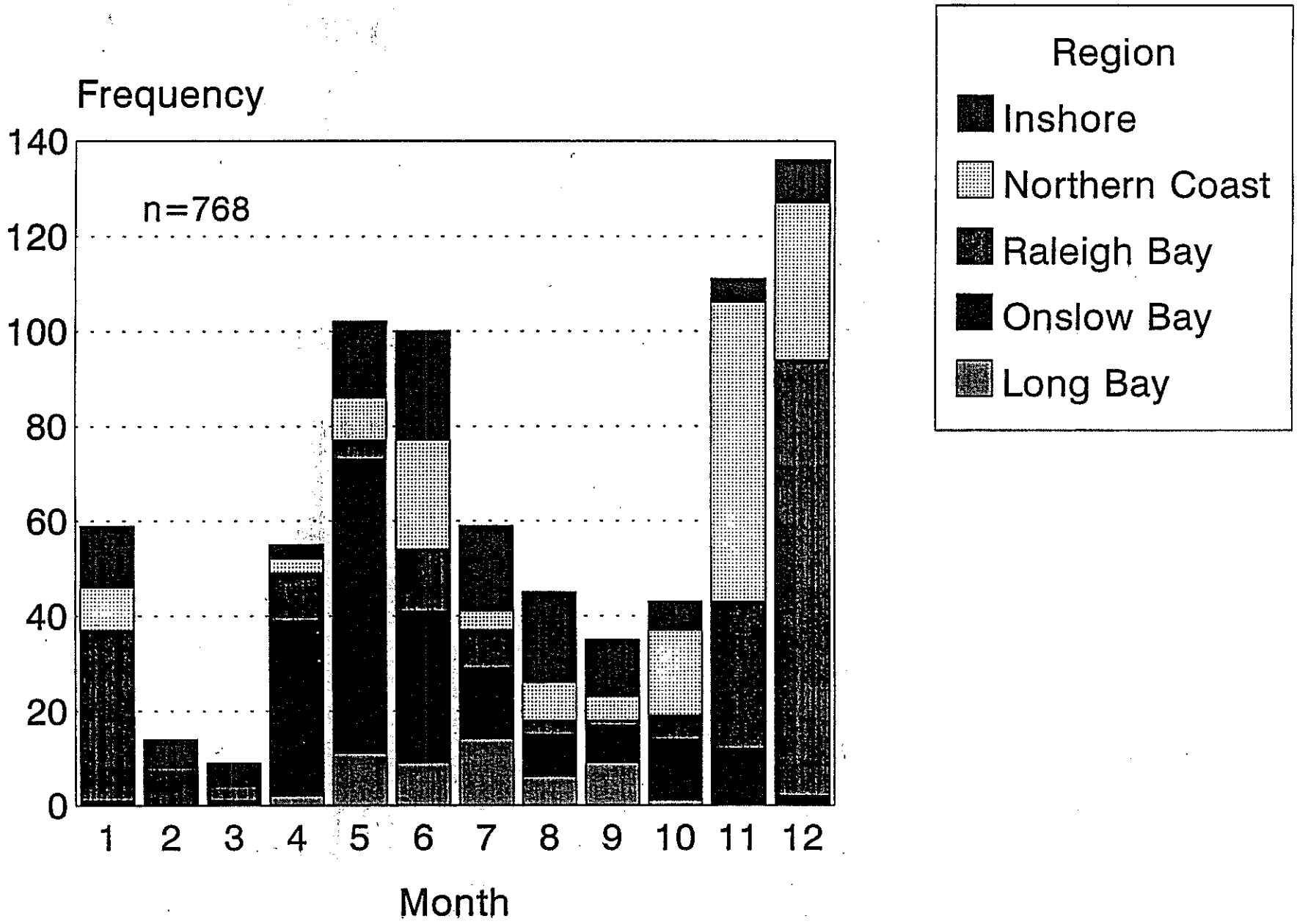
If we look at the distribution of sea turtles strandings in the state (Figure 37), going north to south, you see two peaks in sea turtle strandings. The first in the summer time is made up mostly of strandings in the inshore waters in Onslow Bay and Long Bay, the southern part of the state.

Then we see another peak, which is greater, and is made up of strandings mostly from the northern coastal area and from the Raleigh Bay area. This peak coincides with the peak activity of a number of fisheries, including, bottom-trawl fishery for shrimp, winter trawl fishery for summer flounder, fly-net fishery for sciaenids, and sink gillnet fishery going on off of the northern coast.

An important thing to point out is while looking at the months of May and June, you'll notice historically there has been a relatively small percentage of the total number of strandings coming from the northern coast. Those usually have been made up mostly of the southern and central coastal areas. From the week before Memorial Day through the first week of July we have had 105 sea turtle strandings on the northern coast, which is unprecedented from any year (these are 1980 through 1993 data). This has been unprecedented. It compares to an average of 15 strandings over the last three years, so there is something going on off the northern coast this year, unfortunately it is difficult to say if we will find out what it is. We have gone from an average of 15 to a 105 in the same period of time, and maybe a point of discussion, with Colleen involved, will be what that means in terms of the emergency response plan that we are held to under the Shrimp Fishery Management Plan.

Just as with marine mammals we look at sea turtles for signs of interaction. One of the things that we see is entanglement in monofilament. This is a good example of entanglement in a fairly heavy monofilament line. Another thing that we see often in sea turtles is propeller wounds. Whether or not the animal died as a result of the propeller wounds or was already dead, floating on the surface before it was struck, you just cannot tell unless you see some other form of interaction evidence.

Figure 37. Sea Turtle Strandings in North Carolina, 1990 - 1993.



Just to underline everything I have just shown you about strandings, this is a study that we did in the 1991 - 1992 season. We looked at the distribution of catches of turtles offshore in the winter trawl fishery and we estimated the number of comatose or dead turtles in that fishery ranging from 89 to 181 animals. We compared this estimation to the strandings that we were getting during the same period of time on the beaches.

If every one of those strandings hit that beach, (and there are only 11 in that period of time which was the lowest on record for that particular time), it could have been attributed to that summer flounder fishery, that at best represented 17 to 13 percent of what we estimated died as a result of that fishery.

My point is, if you have strandings and signs of interaction,there is a problem, even though the lack or low number of strandings does not mean anything. Therefore, you can still have a problem and not have anything coming on the beach.

Now I am going to switch to talking about different gears that can be responsible for the interaction with turtles. The first are gears with hooks. Hook and line is used recreationally and commercially, in both inshore and offshore waters. We have documentation that both sea turtles and marine mammals are vulnerable to hooks. I think there are only a couple of occurrences in marine mammals, but sea turtles are extremely vulnerable to hook and line. We ask the public to report sightings to us every year and a number of those sighting cards are sent in.

Neither Vickie Thayer nor I have any evidence off our area of mammals taken with long-line gear, but it is probable, since we do have evidence that they do take the hook. The benthic long line is set on the bottom for reef fish and for sharks. We do have documentation that, again, turtles are taken by this long-line fishery.

The next gear I will talk about is the entanglement gear and this is probably the group of gear that we have the most concerns about. Gillnets set in both inshore and offshore waters have been documented to take sea turtles and marine mammals. The biggest concern is with the larger mesh nets in this area. We have had a tremendous growth in the shark gillnet fishery off of the northern coast.

I believe in 1990 there were no landings reported from this particular fishery of shark, and by 1994 there were reported over nine million pounds landed in North Carolina. So it is a tremendous growth in that fishery. We have also seen a great increase in the number of harbor porpoises and other marine mammals stranding in the same area.

The next set of gears I am going to discuss is the gear that encircles turtles. On turtles, as long as these animals can get to the surface and they are not somehow caught in the net itself or entangled in the net, the survival rate of the turtles is probably very high in any gears.

Now focusing on a haul seine used in Cape Lookout Bight. It is the loggerhead turtle that is being prepared to be picked up and thrown out of the net. This is probably what happens most of the time to the turtles. These gears discussed are used in the inshore waters of the state. We have beach seines used both in the inshore inside of Cape Lookout Bight, and the Albemarle Sound.

We have a purse seine fishery. There is documentation of a single take of a mammal in a purse seine. I do not remember the complete details about it, but we do have documentation of sea turtles taken in a long-haul seine. All that we know of were released alive. All those gears are probably capable of taking mammals. In the case of the beach seine we did have the wipe net in Lookout Bight that did take three mammals on one occasion.

One of the nets we are most concerned about is the stop net. The stop net is a very large mesh net, made of twine, not monofilament. It is set only off of Bug Banks in the central area of the coast. It is a large mesh net and the way that it fishes, it lets what they consider undesirable fish through but it serves as a wall to a lot of fish and they periodically will take the end of it and bring it into the beach almost like a seine.

But because it is such a large mesh net and if for whatever reason a dolphin is in there feeding, this net is quite lethal to mammals. There are only four places along the beach that it can be set, but we see a number of strandings associated with it. The circumference of this net mark around the rostrum of this animal, (this animal was not seen in the net but washed up near shore) matches that of the mesh size used. I have seen this net mark and it is about one eighth inch wide and twisted. It is exactly the twine that is used in that fishery, and we have seen this on many occasions.

You can see the impression of the rope, probably the anchor line used or the float line used for that net. This is actually the same animal. We have a lot of concerns about the spot net fishery. It has been proposed to be recategorized to a category 2 fishery, even though there is such a few number of people involved in it. It is right on the beach, and is set from the beach out for what is the length of the net. The spot net fishery is fished for six weeks in October and November at four locations, this gear consists of a long net that extends from the shore out several hundred yards. Over 90 percent of the catch brought ashore is mullet. It is really a pretty clean fishery and it is for roe mullet shipped to the Orient. It has become very controversial. I was not aware of this interaction, so we are going to have to look at it.

We also have documentation of one sea turtle taken. Again, it is a large mesh net of eight-inch mesh, and when you get that large, you run into problems with sea turtles.

Another fishery to talk about is the poundnet fishery. Again, both turtles and mammals have been documented. We have had quite a discussion about the poundnet fishery.

Turtles are very happy to be in a pound. They come back time after time. We have one animal that has come back two consecutive years to the same pound. He has now been caught 17 different times in that net over the two-year period of time. There is food in there. If they do not have any problem getting the lead, they will go right back into the pound. They are actually a nuisance, but pound nets in South Carolina do not seem to be a source of mortality for turtles, except where the leads are large.

At one time the leads were much larger, like in the late 1960s and early 1970s than they are now. They are now are made of a mesh about six to eight inches and we rarely hear of any entanglement of turtles in the leads of poundnets, but that does not mean it does not occur. Just a month ago there was a dead Kemp's ridley in the lead of a pound net, but by and large the pound nets are not a source of mortality for turtles but they are a great source of take of turtles. We use them as a means to get access to samples of turtles. These same leads can take marine mammals, for whatever reasons. We have had several documented in the leads

This is, again, demonstrating the number of turtles taken over a five-year period of time. We had very few volunteers involved in helping us, but those few volunteers reported almost 900 turtles caught in pound nets in Pamlico Sound.

The last group of gears I will discuss is the bottom trawl, or the trawls. The bottom trawl, shrimp trawl, has been well documented in the encounter rate of turtles. That is 3.8 to 4.9 per 100 hours of standard fishing. The skimmer trawl is also used in the shrimp fishery. It probably encounters turtles at the same rate as the otter trawl. It is not currently required to use TEDs because presumably they bring the net in and check it more often, so the turtles are not forcibly submerged for such a long period of time.

The same goes for a channel net which is like a stationary trawl. It has been documented to take turtles, but it is probably not a source of mortality. They are taking them up and fishing them a lot more frequently. The flounder fishery encounters turtles (this is south of Cape Charles) at approximately the same rate as turtles that are encountered in the south Atlantic shrimp fishery. However, in the Hatteras Bight area we see turtle encounter rates as high as 17 to 24 turtles per 100 hours of towing and that is a very high rate of encounter.

In addition, in the early season in the Hatteras Bight, 60 percent of the turtles caught in that fishery are the Kemp's ridley sea turtle.

We estimated in the 1991-1992 winter season that there were 1063 turtles caught in this fishery. Again, 89 to 181 were dead. This fishery, especially south of Cape Hatteras, is operating almost exclusively in state waters. To the north it is both inshore and offshore. Another fishery that draws some concern, though absolutely no observer information is available, is the flynet fishery. The behavior of a turtle in front of a trawl, actually, once it is caught in the trawl, is to rise up maybe as much as 10 feet. Even though a fly net, the net itself, is not on the bottom, a turtle

rising up 10 feet would put it right in front of the opening of a flynet and we suspect they probably are capable of taking sea turtles.

Another trawl I do not have on here are pair trawls. Pair trawls are used in the mid-Atlantic. I am uncertain if they have gotten down quite as far south as Cape Hatteras. They are capable of taking marine mammals and if they do get into the offshore waters off North Carolina, they are probably capable of taking marine mammals there.

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Participant Q&A and Discussion

PARTICIPANT: I am curious, is that a nighttime fishery in North Carolina, the shark gillnet, what is the

MS. EPPERLY-CHESTER: I am going to let Bill Foster answer that, if you would, please.

MR. FOSTER: I think we are combining two different fisheries, because if you talk about sharks, the dog shark fish, which is going to be primarily a cold water fishery, less than 56 degrees, it is going to be fairly unlikely to encounter the turtles. In the bigger mesh fishery, if you go to, say, 13- to 14-inch, for the large sharks, it is going to be in warmer water and these nets would be a nighttime fishery. That fishery is fairly limited but we were talking earlier, it is a concern.

MS. EPPERLY-CHESTER: We know that nets, at least at one time, I do not know that they are still being set, for king mackerel south of Cape Hatteras have taken turtles, and we know that nets set at least in inshore waters for flounder, that is a five-and-a-half inch mesh, takes turtles and both turtles and mammals seem to be vulnerable even to the very small mesh nets set for scianids, at least off the central part of the coast. We have documentation of both mammals and turtles taken in even the smaller mesh nets. So gillnets are a serious concern and I cannot really tell you how to resolve that one.

MR. FIELD: On that previous slide you showed beach seines being used offshore.

MS. EPPERLY-CHESTER: Yes, that is off the northern coast.

MR. FIELD: I am confused. How are beach seines being used offshore?

MS. EPPERLY-CHESTER: It is not that it is offshore. It means in offshore waters versus inshore waters, and I define inshore as inside of col regs [phonetic] and offshore as outside of the col regs line. So the beach is offshore waters in my definition.

Protected Species/Fishery Interactions Issues & Concerns: South Carolina

by
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Marine Mammal and Sea Turtle/Fisheries Interactions

Loggerhead turtles

Much of the information contained in this section is drawn from *Effects of Turtle Excluder Devices (TEDs) on Loggerhead Sea Turtle Strandings with Implications for Conservation* by Larry B. Crowder, Sally R. Hopkins-Murphy and J. Andy Royle, Copeia 1995(4), pp. 773-779.

Sea turtles can die at sea from a variety of natural and anthropogenic factors, but the extent of mortality in the marine environment is difficult to assess and has gone largely undocumented (National Research Council, 1990). When decomposition occurs, internal gases float carcasses, and prevailing winds or nearshore currents bring some of them ashore. An unknown number never reach shore because they are eaten by scavengers or break apart and sink. Nevertheless, strandings are a useful tool to gain life history information and to provide managers with information upon which to base regulatory actions for fisheries which impact these listed species.

Table 3 is based on loggerhead strandings only, however, they comprise the majority of sea turtles in the stranding database. Strandings in this table illustrate the timing of fishery related mortality and the effects of applied management.

Ocean set net fishery for Atlantic sturgeon

The month of April shows the impact of this fishery on sea turtle mortality. This ocean set net fishery was mainly centered in the Winyah Bay area of South Carolina. Nets were set perpendicular to the beach during late winter until early May. Turtles generally arrive in state waters in April. In excess of thirty carcasses were documented in this portion of the coast during 1980 - 1982. In 1983, the South Carolina Department of Natural Resources (DNR) shortened the season for this fishery by two weeks to provide more protection for sea turtles. This served to reduce the strandings by about half for the next three years. In 1986, because of reduced stocks of Atlantic sturgeon, DNR closed the season on this fishery entirely. This all but eliminated sea turtle mortality during this month. The low number of strandings that continues to occur in April may be associated with other types of trawling that take place now before the shrimping season. These would include trawling for whelk and blue crab.

Table 3. Biweekly Loggerhead Strandings. Dates are at the beginning of the period.

Year	4/1	4/15	5/1	5/16	6/1	6/16	7/1	7/16	8/1	8/16	9/1	9/16	10/1	10/16	11/1	11/16	Total
1980	0	20	28	6	22	64	145	141	67	37	22	18	15	2	0	0	587
1981	10	22	4	7	4	12	62	90	55	10	24	12	5	2	0	0	319
1982	3	35	7	23	26	30	58	27	20	14	2	9	8	1	0	0	263
1983	0	6	9	17	22	18	43	23	14	8	7	2	1	0	1	0	171
1984	4	13	12	2	0	31	43	13	7	4	0	3	0	0	0	0	132
1985	2	14	2	1	2	17	29	13	9	5	5	1	2	0	0	0	102
1986	0	2	5	0	11	40	34	41	15	11	4	5	5	4	3	4	184
1987	0	0	7	22	115	28	33	19	8	7	12	12	3	2	0	0	268
1988	0	2	10	5	0	2	22	21	17	9	5	5	4	0	1	2	105
1989	0	0	1	4	22	8	5	14	11	4	7	4	0	2	1	0	83
1990	3	3	4	1	5	12	14	3	7	1	8	16	12	7	2	2	100
1991	5	5	5	9	5	8	5	5	2	5	2	5	1	2	2	3	69
1992	2	3	4	9	7	5	9	11	4	3	4	3	1	8	1	0	74
1993	2	1	6	1	14	10	6	7	4	8	9	11	1	3	1	0	84

Source: Crowder, Hopkins-Murphy and Royle, 1995

Shrimp trawling fishery

The biweekly totals for stranded loggerheads also clearly illustrates the effects of the shrimp fishery on sea turtle mortality. It is obvious when the nearshore waters were opened to trawling during May and June. A lower number of turtles will strand when the boats are operating out beyond three miles in federal waters. As soon as state waters are opened, then the number of carcasses rises dramatically. The yearly total was often influenced by whether or not there was a spring season for white shrimp. For example in 1985, the season did not open until late June, and there were only 102 loggerheads recorded that year.

In 1980, South Carolina began aerial beach surveys to monitor the population of nesting female loggerheads. By the end of 1987, these surveys showed that there was a decline in the nesting population of more than five percent per year. Based on these data, the Wildlife Commission passed an emergency regulation in 1988 requiring TEDs in shrimp trawls in state waters. Although contested in court throughout the summer, the total number of strandings for the year was reduced. The same pattern was repeated in 1989 when the federal regulations requiring TEDs were held up in court. South Carolina's regulation could not be enforced unless the federal regulations were in effect.

In 1990, TEDs were required by federal regulations in all waters from May through August. When they were no longer required in the fall, strandings rose again. In 1991, TEDs were required all year and strandings stayed at low numbers throughout the turtle season.

With TEDs in effect, the rise in strandings in October of 1992 was unusual. All of the carcasses but one were found on beaches inside of Winyah Bay. The only fishery operating in this area at this time was the channel net shrimp fishery. The DNR has now introduced legislation to require TEDs in channel nets.

Status of loggerhead turtle in South Carolina

Statewide monitoring of the nesting female population continues on a five-year cycle. After the initial decline from the early to mid 1980s, data for the early 1990s show that the decline has leveled off (Hopkins-Murphy and Murphy, 1994). Because the population was declining at the same time strandings were declining, it was difficult to discern exactly how effective the TEDs were. Because stranded turtles include large juveniles and sub-adults as well as adults, we may expect to detect a TED effect more rapidly in stranding data than in data on the abundance of nesting females. The analysis of the paper cited at the beginning of this presentation suggests a 44 percent reduction in strandings related to TED use.

Data gaps and current monitoring programs

Other than strandings, there is little data on the number of juvenile and sub-adult loggerheads. There is also virtually no information on males. Monitoring of the adult female population will continue until an upward trend is documented or until the Recovery Plan goal for South Carolina of 10,000 nests per season is reached.

Marine mammals

The South Carolina Marine Mammal Stranding Network was established in 1991 under the authority of the DNR. Prior to this time, there was no organized network and coverage was spotty. There are few fisheries with the potential for impacting marine mammals in South Carolina. During 1994 and 1995, personnel with the National Marine Fisheries Service Charleston Laboratory and Virginia Marine Science Museum conducted aerial surveys to assess the impact of the shad fishery on marine mammal strandings. This fishery is limited to a small portion of the coast and is still considered a category III fishery after this investigation.

Recommendations

1 Prohibit trawling for whelk and blue crabs after 1 April in state and federal waters.

The use of TEDs to prevent turtle drownings during this time is not practical since the TEDs would retain the smaller, illegal whelks and crabs and would exclude the large, marketable ones.

2. Prohibit any ocean set net fishery after April 1 in state and federal waters. This would include the fishery for Atlantic sturgeon and sharks.

Sea turtles and marine mammals are highly susceptible to capture by this type of net. In countries that still harvest sea turtles, this is the method of choice.

3. De-certify all soft TEDs

When not installed properly, soft TEDs are prone to "bag", making it difficult for sea turtles to exit the net. The configuration of the TED is also prone to change as the cod end of the net fills with catch and the doors are not spread as wide as when the bag is empty. The webbing of soft TEDs is more likely to develop holes that could tangle sea turtles or allow them to enter the bag of the net and drown. It is very difficult for fishermen or law enforcement agents to discern whether soft TEDs are installed correctly and are fishing properly.

4. Eliminate or shorten the flaps on hard TEDs so that they cannot be tied to the grid in a manner that reduces or eliminates the exit hole.

This practice has been reported by some fisherman and is known as "twigging".

5. Require that South Carolina, Georgia and Florida have simultaneous openings of their state waters.

   When there are different opening dates for these states, all of the vessels converge on the waters of that particular state. Large numbers of boats result in multiple captures of sea turtles which drown despite the use of TEDs..

6. Restrict all shrimp trawling to daylight hours.

   Sea turtles are less likely to be able to avoid nets when they are asleep at night on the sea bottom. Also there is likely to be more tampering with TEDs and less law enforcement at night.

7. Require the use of TEDs in channel nets.

   Channel nets can be a local, but significant mortality factor to sea turtles if they are allowed to operate without TEDs.

These recommendations are my own and do not necessarily represent the views of South Carolina DNR.

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She served as Co-leader of the first Sea Turtle Recovery Team, was a member of the Loggerhead/Green Turtle Recovery Team and served on the Wider Caribbean Sea Turtle Recovery Team and Network (WIDECAST).

Fisheries Interactions: Sturgeons in the Southeast

by
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Two species of sturgeon occur along the Atlantic coast of the U.S., Atlantic (*Acipenser oxyrinchus oxyrinchus*) and shortnose (*A. brevirostrum*) sturgeons. Because of the broad latitudinal distribution of both species (Canada to Florida), northern and southern populations differ somewhat in behavior, habitat use, and life history. Both species make spawning migrations to upriver (freshwater) spawning grounds and use the upper estuary as nursery habitat. Shortnose sturgeon tend to remain in the estuary and river for their entire lives, venturing into the ocean only under certain conditions. In contrast, Atlantic sturgeon are truly anadromous. Juveniles generally inhabit estuaries, including the high salinity portions, while adults (and occasionally juveniles) are known to undertake extensive coastal movements.

By 1880, major commercial fisheries for sturgeons were established along much of the Atlantic coast of the U.S. Although the Atlantic sturgeon was the primary target species due to its greater size, the shortnose sturgeon was also landed. These species were heavily fished, and most fisheries (especially the more northern) soon suffered drastic declines or total collapse. The shortnose sturgeon was listed as an endangered species in the U.S. in 1973. More recently, fisheries for Atlantic sturgeon were closed indefinitely in most states. In the southeast, Georgia maintains a limited directed fishery for Atlantic sturgeon with a minimum size limit of 2.1 m, but in 1994 and 1995 only one and five fish were landed, respectively. Although directed fisheries for sturgeons are closed or limited, both species occur in the bycatch of other fisheries, and bycatch is suspected of having a negative impact on sturgeon populations. A variety of commercial fisheries that could impact sturgeons exists along the southern Atlantic coast. No records of incidental capture of sturgeons exist for the various castnet, crab trap, black sea bass trap, or hook-and-line fisheries. More important fisheries in the region, in terms of potential vulnerability of sturgeons to fishing gear, are the whelk trawl fishery (<100 vessels); marine finfish (primarily sciaenids) gillnet fishery (several hundred persons); winter finfish trawl fishery (several hundred vessels); and, winter crab trawl fishery (<50 vessels). Of foremost importance, however, are the American shad gillnet fishery (several hundred persons) and the shrimp trawl fishery (many hundred to a few thousand vessels). Recent research in South Carolina and Georgia has focused on quantifying the magnitude of the sturgeon bycatch, especially in the shad fishery. Additionally, mark-recapture studies provided some information about the relative contribution of several fisheries to the total regional bycatch of sturgeons.

The commercial shad fishery is active from approximately mid-January through mid-April, coinciding with the spawning migrations of shortnose sturgeon. Atlantic sturgeon also spawn during this period, but mature Atlantic sturgeon are too large to be captured in shad nets. Two types of fishing gear are used: set gillnets and drift gillnets. Recent research has concentrated on set gillnets because they are fished on the bottom, usually for days at a time, and are generally checked once or twice a day. Drift gillnets, which are suspended from the surface by floats and allowed to drift, are tended continuously to prevent tangling; thus, fish are usually removed immediately after capture. Opening and closing dates for the shrimp trawl fishery in state waters are set annually, but the season is generally late spring through early winter. Most shrimp trawling effort is in the ocean, but trawling is permitted in portions of some bays and sounds. The effectiveness of bycatch reduction devices on sturgeons is unknown. Bycatch data were derived from several studies conducted in South Carolina and Georgia. Measures of catch per unit effort (CPUE) are in units of number of sturgeons per 91.4 m (100 yard) of gillnet fished for one hour. The lowest CPUE observed was zero, and the highest was 0.137 (Table 4). CPUE varied among years, among river systems, and among portions of a river system. Estimates of total annual sturgeon bycatch in the shad fishery were about 100 to 200 individuals in Winyah Bay, South Carolina and 350 to 400 individuals (including drift net bycatch) in the Altamaha River, Georgia. Mortality estimates based on two years of data from one area suggest that about 16 percent of sturgeon captured in set nets died before release, and that about 20 percent of sturgeon released alive had injuries of varying severity. Based on observed lengths, all Atlantic sturgeon were juveniles and all shortnose sturgeon were mature or nearly so. The predominance of shortnose sturgeon in the bycatch increased with distance from the ocean (reaching 100 percent in the upper Savannah River) because juvenile Atlantic sturgeon generally remain in or near brackish water.

Based on tag returns in mark-recapture studies conducted in the Altamaha, Savannah, and Edisto Rivers, shortnose sturgeon are taken only (with rare exceptions) in the shad gillnet fishery. Atlantic sturgeon, however, occur in the bycatch of the shad gillnet and shrimp trawl fisheries, and occasionally in other trawl fisheries. Although most shrimp trawl bycatch of this species seems to take place inshore (in bays and sounds) and near mouths of rivers, Atlantic sturgeon are also captured in the ocean, sometimes hundreds of kilometers from the river in which they were tagged. The results of a large mark-recapture study (Altamaha River, Georgia) are summarized in Table 5. No information is available on capture-induced mortality in drift gillnets or shrimp trawls, or on its effectiveness on sturgeons. Point estimates of bycatch should be utilized with caution due to temporal and geographic variation. Additional studies, replicated over season and drainage and including delineation of the size and geographic extent of evolutionarily important population units, are needed to refine estimates of the magnitude and impact of incidental capture of sturgeons. In some systems, information on bycatch, especially of Atlantic sturgeon, may also be useful in monitoring year class strength and generating recruitment indices.

Table 4. Catch-per-unit-effort (CPUE; no, individuals/91.4m of gillnet/hr) and estimated total catch (no. individuals)[a] of sturgeons in the bycatch of the American shad fishery in South Carolina and Georgia.

Location (Years)	Gillnet[b] Type	Annual CPUE	Annual Catch
Winyah Bay (1994 - 1995)	Set	0.010-0.013	115-201
Savannah River - lower (1990 - 1992)	Set	0.020-0.066	39-102
Savannah River - upper (1990 - 1992)	Set	0.003-0.031	1-34
Altamaha River - tidal (1982 - 1983)	Drift	0.000-0.043	0-270
Altamaha River - tidal (1982 - 1983)	Set	0.110-0.137	53-247
Altamaha River-upper	Set	0.010-0.037	35-139

[a] Total catches in the Savannah River refer to catches of one individual (the primary or only fisherman in his portion of the river) in each of the two river sections.

[b] Gillnets were 14-cm stretch mesh of various lengths. Set nets were anchored and on the bottom, and driftnets were unanchored and suspended from the surface.

Table 5. Numbers of Atlantic and shortnose sturgeons recaptured, and percentages of total recaptures reported from the bycatch of various Georgia fisheries (of 551 shortnose and 1,534 Atlantic sturgeon tagged and released during 1986 - 1992 in the Altamaha River, Georgia).

	Shortnose		Atlantic	
Fishery (gear)	No.	%	No.	%
Shad (drift gillnet)	7	58	46	47
Shad (set gillnet)	3	25	5	5
Shrimp (trawl net)	1	8	38	39
Whelk (trawl net)	0	0	2	2
Fish (trawl net)[a]	0	0	1	1
Sturgeon (gillnet)	0	0	1	1
Unknown	1	8	4	4
TOTAL RECAPTURES	12	100	97	100

[a] Recaptured off North Carolina

Acknowledgements

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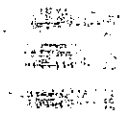
Participant Q&A and Discussion

MR. PAYNE: For shortnose sturgeon, you presented information by river systems. Is each river system considered a separate stock?

MR. COLLINS: As far as we know, each river system is a separate population of shortnose sturgeon. There is some talk of listing them on a river-by-river basis for that reason. Atlantic sturgeon, though, tend to be wanderers, so just because you catch one in a certain river or bay does not mean that it came from that river.

MR. FLAGG: I would like to comment about the potential mortality rate for shortnose sturgeon from other fisheries. Maine did quite a lot of work on this in the early 1980s. Gillnets, set overnight for a 24-hour period, were used to capture approximately 1400 shortnose sturgeon specimens. These fish were tagged and released them. We found that we had very low mortality in areas when fish were caught in water temperatures of 20 degrees Centigarde (°C) or lower. As the water temperatures increased to 23 to 25 °C, we experienced quite a lot of mortality. I think a lot of these interactions and potential mortality issues are associated with time and environmental conditions under which these fish are taken.



Marine Mammal & Sea Turtle Interactions with Fisheries in Georgia

by
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Introduction

In comparison to many other coastal states, Georgia's commercial marine fisheries are simple. The five top fisheries, ranked by average annual value from 1990 to 1994, are food shrimp, hard crab, bait shrimp, whelk, and shad. The food shrimp fishery is prosecuted by otter trawls and occurs in state territorial waters (zero to three miles from shore) and adjacent federal waters. The hard crab fishery is prosecuted by pots and occurs exclusively in state waters, primarily in inshore waters that are normally closed to shrimp trawling. Bait shrimp trawls are restricted to designated bait zones in creeks and rivers of inshore waters, and also are under many other regulations including maximum size of the trawl, limits on the catch, and limits on the amount of the catch that can consist of dead shrimp. The whelk fishery is a trawl fishery and is primarily conducted by shrimp trawlers during the winter when shrimp are not available. The shad fishery consists of both set and drift gillnets and is regulated as to the times, places, and methods by which gear can be deployed. Shad netting is not allowed seaward of the beaches in Georgia's territorial sea.

Shrimp Trawl Fishery Interactions

Over the years, the most important interaction between protected species and fisheries in Georgia has been the incidental capture and drowning of sea turtles in shrimp trawls. This problem was noted in the late 1970s and early 1980s when large numbers of sea turtles washed ashore during spring and summer when the shrimp fishery was active. Although strandings have declined since the implementation of Turtle Excluder Device (TED) regulations in 1989, 231 turtles stranded in 1994 suggesting that the shrimp trawl sea turtle interaction has not been resolved. A review of sea turtle strandings by NMFS' statistical zones illustrates the importance of Georgia in terms of sea turtle mortality. The average number of stranded sea turtles (1990 - 1994) in zones 30 and 31, which include the Georgia coast, are the highest for any zones in the southeastern U.S. with the exception of zones 27 and 28 (off Florida's central Atlantic coast). Average annual strandings of the endangered Kemp's ridley turtle (1990 - 1994) are higher in NMFS statistical zones 30 and 31 than in any zones outside the Gulf of Mexico. Based on these data, documented sea turtle mortality in Georgia waters is among the highest noted anywhere in the southeast. The importance of shrimp trawls as a source of this mortality is clearly illustrated by comparing sea turtle strandings with shrimp landings during the months of April, May, and June. The shrimp fishery in Georgia during the period April to June targets roe white shrimp that are spawning in Georgia's territorial sea and the federal waters immediately adjacent to the

territorial sea. The success of the roe shrimp fishery varies widely from year to year depending primarily upon the severity of winter weather conditions during the preceding winter. If the water temperature falls to near five degrees Centigrade, over-wintering white shrimp in Georgia's estuaries are killed and production during the following commercial roe shrimp season is low. This occurred during the winters of 1980 - 1981, 1983 - 1984, 1984 - 1985, and 1989 - 1990. The low shrimp landings in such years are always accompanied by low numbers of stranded sea turtles in the same months. Since the implementation of TEDs the pattern is not quite so dramatic. In 1989, high landings of roe white shrimp were accompanied by relatively low strandings of marine turtles. Interestingly, Georgia DNR completed a program to distribute free TEDs to Georgia's shrimp fleet immediately prior to the beginning of the 1989 shrimp season. The TEDs were purchased with funds obtained from the Office of Energy Resources as part of an oil overcharge settlement. Although the federal rules requiring TEDs, which were to have gone into effect on May 1, 1989, were delayed most of Georgia's fleet was equipped with the free TEDs in anticipation of the rule and many captains left the TEDs in at the beginning of the season to aid in excluding "jelly-balls".

The primary species which strand in Georgia include the loggerhead, Kemp's ridley, leatherback, and green sea turtles. Green sea turtles are not abundant in Georgia waters, at least based on strandings, and there is no clear pattern of occurrence for this species. Loggerheads are the most common turtle to wash up on Georgia's beaches and strandings of this species exhibit a clear pattern of occurrence with peak strandings during the warmer months of May through September. Leatherback sea turtles have the most restricted pattern of abundance in Georgia with over 77 percent (81 of 105) of the strandings occurring during the months of April and May. The occurrence of Kemp's ridleys appears to be bimodal in Georgia with highest numbers in June and November.

The number of trawlers licensed to fish for shrimp in Georgia has exhibited a slight decline from 1989 - 1990 to the present. However, it is not known if this represents a decline in fishing effort. Although strandings of marine turtles have declined in recent years compared to the early 1980s, additional measures appear to be needed in this fishery to protect sea turtles. In addition, the shrimp trawl fishery may interact with manatees and with the shortnose sturgeon, especially if Georgia's sounds, designated areas of Georgia's inshore waters, are opened to trawling. This management practice has not occurred since 1989, but may take place in the future.

Increased protection of sea turtles from incidental capture in shrimp trawls could be provided by one or more of several additional measures. One such measure would be a change in how the boundary of Georgia's territorial sea is enforced. Currently, the prohibition on trawling for shrimp in Georgia's state waters prior to June 1 is not enforced throughout the full territorial sea (out to what is commonly known as the "scallop line"). Instead, the state waters boundary is enforced out to three miles from upland beaches. Enforcement of the "scallop line" would greatly reduce the area available for trawling off St. Marys Entrance and several other areas and would limit fishing effort prior to the opening of the territorial sea. The justification for keeping

Georgia's waters closed until after June 1 is to protect spawning white shrimp; however, from 1980 to 1994, 55.5 percent of the roe white shrimp harvested in Georgia were landed prior to the opening of the territorial sea. In some years over 80 percent of the roe shrimp are landed before state waters open. The current policy of enforcement of the territorial sea boundary may not be accomplishing its goal with regard to protection of spawning white shrimp. A disadvantage of this measure is that it may be difficult to enforce. Another conservation measure would be to coordinate the opening of Georgia's and South Carolina's state waters so that fishing effort would be dispersed. In recent years, sea turtle mortality has been observed in association with periods of intense effort such as occurs immediately after the shrimping season opening. A possible cause of this mortality is multiple recaptures of sea turtles in TED equipped nets. Because South Carolina waters often are opened one or two weeks prior to opening of Georgia's waters, many fishermen migrate to both states to fish the opening days, thus greatly concentrating effort and increasing the likelihood of multiple recaptures of turtles.

Another important measure that is needed is a smaller limit on the size trynet that can be used without having a TED installed. Fishermen have reported to Georgia DNR that catches of marine turtles are common in trynets. These nets are typically from 12 to 20-foot in headrope length and normally are checked every 30 minutes to evaluate the abundance of shrimp and other species in the catch. However, sometimes fishermen neglect to retrieve the trynets on a regular schedule and since these nets are not equipped with TEDs, sea turtles may be caught and drowned. This mortality could be reduced by limiting the size of nets that can be used as trynets without TEDs.

Finally, the most important measure, in the opinion of Georgia DNR nongame biologists, would be a prohibition on the use of soft-TEDs. Many fisherman have reported problems with soft-TEDs and tests by the National Marine Fisheries Service's Pascagoula Laboratory have demonstrated that soft-TEDs do not work in all types of shrimp trawls. Furthermore, it is difficult for an enforcement agent to determine what type of net is being used on a trawler and whether or not the soft-TED has been properly installed. Even with proper installation, maintenance of soft-TEDs is often a problem because the webbing in the soft-TED excluder panel is often broken by sharks which are caught in the panel. The holes resulting from these broken meshes could entangle turtles or allow small turtles to pass into the bag.

Interactions between manatees and shortnose sturgeon and shrimp trawls are not thought to be a problem under the current management strategy which severely restricts trawling in inshore waters. However, if Georgia's sounds were to be opened to trawling in the early fall, during September or October, manatees could be captured. Likewise, trawling in inshore waters would increase the risk of capture of shortnose sturgeon. Shortnose occur in the sounds but rarely venture into the territorial sea where most shrimp trawling now occurs. Georgia's small sounds are crowded on opening days and the possibility of capture for protected species in the sound is quite high.

Blue Crab Pot Fishery Interactions

Unlike the shrimp trawl fishery, the blue crab pot fishery has experienced an increase in participants in recent years, resulting in an increased effort in this fishery. Crabbers often complain to DNR about damage to their pots and catch which they believe is caused by sea turtles attempting to prey on crabs in the pot. Georgia DNR has documented crab pots which had been rigged with hooks on short leaders at each corner of the pot. These hooks were probably placed on the pot to snag turtles and in fact we first located these pots when a dead turtle was reported foul-hooked on a pot with one of these rigs. Perhaps more importantly, discarded crab pots can block the escape hole in hard or soft TEDs causing the TED to malfunction with a resulting loss of catch for the shrimper and a potential for mortality of marine turtles. At least three blocked TEDs were documented during the opening of Georgia's territorial sea during 1995 and many more were alleged to have occurred. One partial solution to this problem would be to prohibit use of crab pots on the beaches where trawling occurs. An educational effort also should be undertaken to encourage crabbers to remove old pots from inshore waters rather than simply discarding them overboard.

Bait Shrimp Fishery Interactions

The bait shrimp fishery has not been documented to take protected marine species in Georgia. Given the small size of nets allowed in this fishery and the short tow times that are necessary in a live bait fishery the potential for incidental capture and mortality of protected species in this fishery is small.

Crab & Whelk Trawl Fishery Interactions

Georgia's whelk fishery is prosecuted under the laws regulating crab trawling. The minimum mesh size for crab trawls is four-inch-stretched mesh. Most participants in this fishery are shrimp fishermen who trawl for whelks in winter when state waters are closed to shrimping and shrimp are not available in federal waters. Crab trawls will take sea turtles when used in areas where sea turtles occur. Furthermore, currently approved TEDs are not likely to be effective in the crab/whelk trawl fishery because many of the whelks would not pass through the four-inch bar spacing in the TED excluder grid. Incidental capture of turtles in the whelk fishery could be prevented by restricting crab/whelk trawling to winter months when turtles normally are absent from Georgia waters. If whelk trawling were restricted to the months of December to March, sea turtle captures would rarely occur in this fishery. This would not have a significant impact on the fishery because 82 percent of the landings of whelks from 1990 - 1994 took place from December to March.

Shad & Atlantic Sturgeon Gillnet Fisheries Interactions

Georgia allows only two gillnet fisheries, shad and Atlantic sturgeon, in state waters. The sturgeon fishery has not received much effort since 1989, when restrictions were placed on this fishery to protect Atlantic sturgeon. The shad fishery appears to be stable, with little change in numbers of licensed fishermen during the period 1989 - 1990 to 1994 - 1995. The shad fishery is strictly regulated in terms of the places, times, and types of gear that can be used. Drift and set nets are used in this fishery in the major freshwater rivers and in the sounds immediately adjacent to those rivers. These fisheries occur exclusively in the winter and are not likely to take marine turtles. Neither fishery has been documented to take bottlenose dolphins in Georgia; however, observer data are limited. From 1990 to 1994, a total of 112 bottlenose dolphin carcasses were stranded in Georgia, and only four of these carcasses bore evidence of entanglements with fishing gear. One animal was entangled in the float line of a crab pot and three carcasses bore wounds consistent with an entanglement of some type. None of these animals exhibited marks from gillnets. In contrast, bycatch of shortnose sturgeon in the shad fishery has been well documented. Because drift gillnets are continuously monitored by the fishermen, the opportunity to release incidentally captured shortnose sturgeon alive is greater than in set nets which are sometimes fished only once every 24 hours. The use of set nets should be restricted in habitats known to be important to shortnose sturgeon. Such areas may include spawning sites and staging areas.

Shark Drift Gillnet Fishery Interactions

Although the focus of this workshop is on fisheries in state waters, there in one additional fishery of concern in the southeast that takes place in federal waters just outside the territorial sea. This fishery is the shark drift gillnet fishery. In late February 1994, a northern right whale calf less than two months old was observed off northeast Florida with wounds consistent with entanglement in a large mesh gillnet. The movements of this animal suggested that it was migrating north and that its injury occurred somewhere south of Jacksonville. The use of large mesh gillnets, such as the shark drift nets or any other nets should not be allowed in the right whales critical habitat in the southeast.

Summary

Georgia's major marine commercial fisheries consist of a trawl fishery for shrimp, a pot fishery for blue crabs, a trawl fishery for bait shrimp, a trawl fishery for whelks, and a gillnet fishery for shad. The most important fishery in terms of interaction with protected marine species continues to be the shrimp trawl fishery. Additional measures are needed to protect sea turtles from capture in trawls. These include decertification of soft TEDs, restrictions on size of try-nets, and a coordinated opening of Georgia's and South Carolina's territorial sea. Whelk trawling should be limited to the months of December to March when sea turtles are not abundant in Georgia waters. Set nets used in the shad gillnet fishery should be restricted in important shortnose sturgeon habitat.

Sea Turtle/Fisheries Interactions in Florida*

by
Barbara Schroeder
Florida Department of Environmental Protection

Introduction

I am going to present three things: (1) a very brief overview of marine mammal strandings and interactions on the Atlantic coast of Florida, (2) an even briefer review manatees strandings and mortalities, and (3) a detailed review of sea turtle/fishery interactions along the Atlantic coat of Florida.

Marine Mammals

The marine mammal, non-manatee data that I am going to summarize was provided by Dan Odell, who is the Southeast U.S. Stranding Coordinator, located at Sea World in Orlando. These data are for the Atlantic coast only, Nassau County through Monroe County is what I am considering Atlantic coast for the purposes of all the data I am going to discuss today.

Since 1978 through the end of 1994 there were a total of 1,650 cetacean strandings on the Atlantic coast of Florida. The overwhelming majority of these are *Tursiops*, the bottlenose dolphin, followed by pygmy sperm whales. During the most recent five-year period cetacean strandings on the Atlantic coast of Florida ranged between 103 and 191 animals per year. These strandings cluster in two regions along the east coast, the first in the two-county region of Duval and Saint John's, which is along the northeast coast, and the second cluster in Valusha and Brevard Counties along the central part of the state near Cape Canaveral.

Evaluating and determining the cause of death for stranded animals is a very difficult thing to do, especially in the case of takings and active fishing gear, when the gear can and often is removed from the carcass. The stage of decomposition also plays a critical role in the ability to see entanglement wounds or marks of this nature, and the length of time that an animals spends in the gear will also have an effect on whether or not entanglement marks occur, to begin with, or persist after death. There are few documented interactions where gear persists on animals or even those that exhibit entanglement marks.

Some animals have come in with monofilament line entangled, some with gillnet gear, and some with mouth wounds that indicate possible captures on hook and line. We also know that *Tursiops* associate quite regularly with the shrimp trawl fishery. They feed on the bycatch. I

* text edited from verbatim transcripts

have spent a lot of time on trawlers doing turtle-related things and as soon as those winches are put in motion, the *Tursiops* converge on those boats to wait for the bycatch to come overboard. The exact extent of the interactions with the marine mammals off the Atlantic coast of Florida is unknown; but it is certainly something that deserves close monitoring.

Manatees

As for manatees, the data come from the manatee mortality database that Florida's Marine Research Institute maintains. It includes manatee data for the entire U.S. Statewide Florida averages about 156 manatees deaths per year over the last five years. For rescued animals or animals that go to rehabilitation centers in the state, about 15 to 20 per year, so it is a much smaller number. Additionally, it is estimated that from 1974 through 1994 a total of 38 animals out of about 1500 total manatee mortalities resulted from fishing gear interactions. Although this number represents a small percentage of the overall mortality, about 1.6 percent, it probably does not represent the exact number that interact with fishing gear because of the difficulties related to determining actual cause of death.

There is seldom definitive evidence at the time of necropsy that would indicate to a pathologist that a manatee was caught in fishing gear and drowned as a result. A very high percentage of the manatee carcasses that come in undergo extensive necropsy at the pathobiology laboratory in St. Petersburg. But it is just not an easy thing to do, to tell for certain what happened to an animal. A lot of animals go into the undetermined category.

Some of the gears that are believed to interact with manatees include: shrimp trawls; gillnets and trammel nets targeting all kinds of finfish; hook and lines; trap lines, which are primarily our crab and lobster pot fisheries, which entangle manatees; and hoop nets, which are similar to channel nets.

Scar catalogs, maintained on live animals, indicate that about five to seven percent of the thousand animals now cataloged show evidence of trap line entanglement. The entanglements can often lead to systemic infections that eventually kill the animal. There is some concern with the net ban going into place that some of these fishermen may be moving into the trap fisheries and that may exacerbate the problem in several places around the state.

Sea Turtles

With regards to turtles, on the Atlantic side we average about 400 to 600 carcasses annually. These are primarily loggerheads, followed by green turtles, Kemp's ridleys, leatherbacks, and hawksbills. Our problem is complicated in Florida because of the extent of our coastline. There are five species of turtles that are present year round, including juveniles, immatures, adults, resident adults, breeding adults. Additionally, there are a lot of fishery activities that go on, including boating that impact turtles in one way or another.

Turtle Mortality Associated with Fishing Activities and Gear

Monofilament Entanglement

From 1980 through 1994, a total of 322 animal carcasses were taken along the Atlantic coast of Florida. Of these, 31 percent showed signs of monofilament entanglement, probably coming from both recreational and commercial hook-and-line fisheries. Most of these occurrences happened from Indian River County to Broward County, where there is a high incidence of recreational fishing activities and turtles are abundant. Additionally, there is a lot of hard bottom in this area, where gear is discarded or gets caught. Turtles use these same areas to forage, rest and sleep, and probably get involved with a lot of this gear because of the hard bottom.

Gillnet and Trap Line Entanglement

The next gear which results in high causalities is net or trap line entanglement. In the case of gillnets, much of it is taken off by the fishermen and I suspect the same with trap line entanglement. Occasionally they are cut out. Most of this occurs off the coasts of Indian River, St. Lucie and Martin Counties, which are off the south central coast of Florida. An extensive nearshore gillnet fishery for pompano, bluefish, and Spanish mackerel occurs in this area. In fact, the State has been struggling with this nearshore gillnet fishery for the past three to four years. There were a series of rules that were put in place by the Marine Fisheries Commission to try to alleviate the problem, which did help. We had mortality and strandings decrease by almost 50 percent when the first rules regarding net length and soak time were implemented.

This nearshore gillnet fishery happens to occur very close to shore off of Jupiter Island, where there is also a lot of nesting activity for loggerheads, green turtles and leatherbacks. During nesting season, these animals -- both immature animals that are foraging and living on the hard bottom and nesting females that are moving back and forth from the water to their nests on the beach -- are regularly encounter gillnets. Sometimes the gear is just cut and the animals wash ashore. In other cases, entire nets have been abandoned. We have records of sections of abandoned net containing 10 green turtles and one dead loggerhead that have washed ashore. So it is a very common problem.

Another cause of high mortalities is trap line entanglement. A fairly common problem are leatherbacks and other sea turtles becoming entangled in a crab or lobster pot line in the Keys.. There is an incredible amount of traps fished off Florida's coast, especially in the Keys area.

Monofilament Ingestion

Monofilament ingestion is different from entanglement, which is being externally entangled in the line. There are two ways of determining ingestion. In the first case, one can actually see the line coming out of the mouth or coming out of the cloaca. In the other case one can find it in the

digestive tract upon necropsy. Only a small percentage of turtles that wash ashore are necropsied; it depends on the species and the area. We do as many as we can. On average, across all areas and all species, we probably necropsy about five to 20 percent a year.

Summary

That is all I have. There are many ways to present the data and we could go on and on for hours looking at species and temporal occurrence. The Florida net ban is going to have positive effects for marine turtles in state waters; that is certain. But I think one of the really important things we need to recognize about all this, is that you cannot definitively say what happened to every animal, every carcass, that hits the beach. You will notice I have not presented anything about shrimp trawl interactions, although we know that turtles are taken extensively in shrimp trawls; the carcasses are not washing ashore. That does not mean that it is not a problem. In my mind, this type of mortality is very cryptic and we really need to get at a lot of it with observer effort, comprehensive enough to have an unbiased sample.

Participant Q&A and Discussion

MR. STREET: Has there been enough time to see any noticeable reduction in takes with the institution of the lobster pot trap limits and the reduction in numbers of traps?

MS. SCHROEDER: No. It may just be that it is not long enough or the number of traps is not reduced far enough. It is the lowest of all of these categories of interactions -- 14 animals out of 322. Again, most of these are the central and southern parts of the state, with a peak in the upper Florida Keys.

Shrimping and Protected Species Concerns off the Coast of Georgia*

by
Jack D'Antignac
Georgia's Fishermen's Association

Thank you. Georgia shrimpers have become extremely aware of the need to protect our marine environment, including sea turtles. The only way we can exist or survive is to have a clean, productive, well-balanced and healthy marine environment. Please do not categorize the Georgia and South Carolina shrimpers with some of the shrimpers in the Gulf who have blockaded Galveston Harbor and all those things trying to protest the use of turtle excluder devices (TEDs). In fact, we started using TEDs long before they were mandated by law. In 1969, the first TED was developed. At that time we fudged a little. They were really being used to get rid of the cannonball jellyfish or "jellyballs" but in doing so it got rid of any large debris or animals of the sea and saved turtles. It also improved the quality of our catch.

I first tried to build a jellyball shooter -- turtle excluders we call them now -- myself. I used a hoola-hoop and stretched string tied about three inches apart. I hoped that would work, but the hoop collapsed and tore up my net, so the hoola-hoop was a bad idea, but it was a good principle.

Shrimp trawlers, especially in Georgia, have no negative interaction with dolphins or whales. I think I heard of two cases in the inshore fishery where manatees were caught, but that is not a pressing thing. We seem to be mostly concerned with turtles.

My main point is that Georgia shrimpers and, as far as I know, most of the South Carolina shrimpers are not against using TEDs. The Georgia coastline is unique in that we need to use TEDs even if it were not for the turtle deaths. On June 21, 1995, the National Marine Fisheries Service (NMFS) imposed on the Georgia shrimp trawlers the Emergency Response Plan. This prohibited the use of all soft TEDs during this period, and required us to turn the hard TEDs, or the grate type TEDs, upside down. We had no problem. We had a meeting of the full membership and nobody complained about the soft TEDs being eliminated for this period of time. In fact, most of our association members feel that we should permanently eliminate the use of soft TEDs in tongue nets, a type of net with a center cable, because if the soft TED is even a little bit out of adjustment on tongue cable, a pocket will form and cause drownings of turtles.

But our main concern with the hard TEDs being turned upside down was the uniqueness of the Georgia coast. We have between a seven and nine foot difference every couple of weeks in the high and low tides and that causes extremely fast current flow, washing palmetto roots, stumps, limbs, and all kinds of waterlogged marine debris into the channels and into the fishing grounds.

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* text edited from verbatim transcripts

These heavy objects will plug up the excluding hole in the top of the grid. These objects are so heavy, they will not go out of that top grid. Also, conches build up in the bottom of it, because there is no place for them to go. We tried to convince NMFS of this, with very little luck. We even went to Washington and met with Rollie Schmitten. They were very receptive and they have given me their word that starting on July 21, 1995, if they have to reimpose the emergency plan, that we will be allowed to pull the turtle excluders the proper way, using hard grids.

NMFS conducted and recorded tests with the hard grid, top shooting and bottom shooting, and showed us the videotaped results when we met in Washington. There is about a 30 or 40 second difference in the escape time of the top-shooting TEDs and the bottom-exiting TEDs. It takes the turtle about 40 to 50 seconds longer to go out of the bottom. We tried to explain to them that they used tame turtles. They had been raised from hatchlings in a four- or five-foot-deep pond and never had to dive -- never been in over four or five feet of water. They were hand-fed by humans. So they take a turtle out to 40 or 50 feet of water, put him in a sack, and they cannot understand English, you cannot tell them to, "Go get a deep breath now, you're fixing to go down 40 feet. So the turtle panics, and they released him in there, and naturally it takes him a little longer. He is trying to get up to get a breath. He has not had a breath in too long of a time already.

We feel that wild turtles react quite differently and that even if it was 40 or 50 seconds longer, that would not kill the turtle. There is some concern about multiple catches, going through the TEDs too many times when there is a concentration of boats. This could be a problem. As Mike Harris stated, if we could coordinate the openings of the season with South Carolina and Georgia, it would be a lot better, because we would not have an influx of 350 boats in one little area all at once. That would help the situation, I believe.

In a much broader perspective, we need to address all the causes of turtle mortality. There are many different reasons for turtle deaths besides shrimp trawlers. We are not trying to get out of the fact that we cause turtle deaths, but we feel that the hard TEDs are working to at least 97 percent efficiency. We do feel that the soft TEDs are a problem. Both Mike Harris of Georgia Department of Natural Resources and Sally Murphy of the South Carolina Department of Natural Resources seem to be of the same opinion. Most of the members of our Georgia Fishermen's Association feel that we should outlaw the use of soft TEDs on the east coast, at least in the tongue trawls, because they seem to cause problems, and if that is the problem, we need to remedy it.

But what NMFS has done in its Emergency Rule Plan, has been to disallow the use of soft TEDs, which possibly helped the situation and, in turn, require the use of hard TEDs upside down, possibly causing more turtle deaths. The stranding report showed fewer turtle deaths after this was implemented, but they had about a 10-day west wind which blew whatever turtles were killed offshore. I have many reports from our members who told us that they have found turtles in the nets, especially ahead of a clogged grid that had some kind of debris in it, or when

they run off on the nets to get ready to drop them back in the water. You have to have a little speed, because the doors of the net, when they go in the water spread the net, and as you run off on it, the way a hard TED is designed, it is made to go with the water flow by just surfing along like a surfboard. When you turn them upside down, they catch the water and try to flip and when they flip, if they ever go past 180 degrees, then they roll on over. I brought a video of this with me today to show you. Unfortunately, there is no available video monitor. We had a boat take several different drags as he took up and put out and almost every time it put a twist in at least one of the four nets that they pulled. This twist prevents the turtle's escape route. He cannot go past this twist, because your drag lodges ahead of that, too. But we are getting a little more cooperation; at least we have the word of the National Marine Fisheries Service that if this Emergency Rule Plan is extended, we will not be forced to pull them upside down. We feel that that was a bad idea.

I was saying there are many reasons for turtle deaths beside shrimp boats. Ingestion of plastics carelessly discarded in the ocean is one cause. Shark longline and gillnet fisheries drown and kill many turtles. Admittedly, some crabbers, in retaliation against big loggerhead turtles destroying the crab traps in trying to get in there and eat the crabs, shoot the turtles when they surface for air and put hooks in them. Those hooks, I was told by some crabbers, are baited with crabs, which is a favorite food of the turtles, and the trap has a heavy weight on it, which prevents the turtle from coming to the surface to get air and ultimately drowns it.

Traditionally, most of the strandings along the Georgia coast have been on Cumberland and Jekyll Islands -- not all of them, but the majority of them. We feel that quite a bit of this is caused by the submarine base just south of Cumberland Island, Saint Mary's River. A million horsepower atomic submarine goes by. That has got to cause some kind of damage to the turtles even if they do not get cut up in the prop wash. The trauma, whatever the case may be, could not be good for them. If the stress of going through a turtle excluder two or three times would kill a turtle, definitely going through the prop wash of an atomic submarine would be, but we cannot stop the military. Cargo ships and cruise ships going in and out of the channels, of course, recreational fishing boats, and yacht traffic all contribute to turtle deaths.

Dredging operations also have an impact on sea turtles. NMFS and the Georgia Department of Natural Resources seem to think that pipeline dredges are not a danger to turtles, but they have got a huge cutter head and a strong pump. It may not suck the whole turtle in, but it can dismember and kill it. This year at the opening of our season most of the strandings were up north, where, from the 15th of May through the 1st of June, there was a dredging operation renourishing Tiby Beach on the Georgia coast. We feel that that was responsible for quite a few of the turtle deaths.

We are not trying to place all the blame on somebody else, but we just feel the other causes should be addressed. Our association worked closely with the Department of Natural Resources to have lighting ordinances imposed on the islands that are inhabited to keep the hatchlings from

crawling the wrong way and dehydrating. Sea walls on beach-front property prevent turtles from finding a nesting place.

In beach renourishment, when they pump this new sand up on the beach, the wave action causes little bluffs. It will wash the sand away, because it is not the natural sand that was there. Eventually this probably would smooth out. But this causes an obstacle where the turtles cannot get up on the beach to lay their eggs, also.

Shark attacks, of course, cause a lot of problems. As Mike showed you, that slide was taken on one of my boats. The crab traps are abandoned with their weights cut off and thrown into the channels. As soon as the abandoned pots grow a little seaweed on them, the water resistance causes them to start tumbling and they roll out into the channels and on the fishing grounds and, in turn, they plug the holes, making the turtle excluding devices inoperable. This is a problem that we definitely need to address. We are hoping that we can convince the crabbers to start crushing those traps.

I realize when a crabber has 200 traps and it is time to change to new ones, it would be a job to bring them all to land and dispose of them in landfill, but if they would at least crush them down flat, where the water resistance would not cause them to tumble into the ocean, or possibly put them along the banks where oysters could grow on them, that would help the situation quite a bit.

I have been informed by the Department of Natural Resources and some other environmental organizations that we have reported a lot more turtle nestings this year than normal, which is encouraging.

At our last meeting there were over 300 members present and the majority of them feel that the soft TEDs are the main problem. In talking with Mike, as I said, and Sally Murphy, they feel this is a main problem, too. We are hoping to get the soft TEDs outlawed completely.

We were informed that there have been over 100 turtle strandings in North Carolina over a two- or three-week period and there was no shrimping activity going on at that time, so this emphasizes the point that shrimp trawlers do not pose the only threat to turtles. It just emphasizes the fact that we need to look into the other causes of death. Ten to 15 years ago there were between 1400 and 1500 fishing licenses issued yearly in Georgia. Now there is between 400 and 500. Of course, the boats have gotten bigger, but turtle strandings have gone up. I used to roam the beaches when I was much younger all the time and hardly ever saw a dead turtle, but apparently there are a lot more strandings, although there are lots fewer boats working. So there has got to be some other cause addressed to stop this slaughtering of the turtles.

As I said, we are not trying to deny the blame for any turtle strandings that are caused by shrimp boats, but we feel that the other causes of mortality should be addressed, also. Thank you.

Fishing and Protected Species Interactions off the Coast of North Carolina*

by

Bill Foster

Thank you. When I agreed to come to this workshop, I was not really sure what I was getting into, but I did not have much else on the agenda for July and I thought it would be a good trip. Since that time my time has been pretty well taken up.

After I got the agenda and looked at the objectives, I was not real sure where the fishermen fit into this process, so I could not figure out how to come up with a prepared statement. The comments I have will be primarily those of my own rather than as a representative of the commercial fishing industry in North Carolina.

The first thing I would like to say is we as fishermen do not want any interactions with protected species and try as best as possible to avoid them, but they do occur. And why do they occur? The two most obvious reasons are that the animals are present and the gear is present. But some more basic questions -- that I think maybe some of you might be able to help fishermen with -- concerns when you have an interaction and the animal becomes entangled in the gillnet, did the animal just ignore the gear, it did not see it, or it did not care? Was the animal sick? Or is there some behavioral reason, some change in feeding pattern, or whatever, that causes an increase in interactions?

One other cause of interactions are fisheries regulations that are put in place for other reasons. Sheryan Epperly has mentioned the stop nets. That is the first time I had heard of a dolphin being killed in a stop net. Stop nets were developed by the fishermen in response to the complaints of beach fishermen regarding crews riding up and down the beach and sitting on schools of mullet. So the fishermen figured out a way to set out a big mesh net, slow the mullet down, sit on them, and do it in one place without riding up and down the beach and disturbing people. Well, we had a lot of complaints from the piers that they were catching all the fish, so we had to do some studies.

The initial call for the webbing in the stop net was for 12-inch in part of it. It was larger than the eight-inch that is in that. I was one of the people who objected to that and said this is going to cause problems, do not go to 12-inch. It may be possible that we can go to something smaller. The reason it is eight-inch is because the sport fishermen, and especially the pier operators, want everything to go on through with as little bycatch as possible.

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* text edited from verbatim transcripts

Just as a fellow told me once that every boat is a compromise, every piece of fishing gear is a compromise. As we get more information, then maybe we can do a better job of developing that gear to take care of the variations that come up.

The second fisheries regulation that I would like to address is the proposed weakfish moratorium. The National Marine Fisheries Service has proposed a moratorium on possession of weakfish in the exclusive economic zone (EEZ). The fishermen, especially in the Hatteras area, Dare County, North Carolina, have worked with the Atlantic States Marine Fisheries Commission over the past four years to try to stay in compliance with a plan that they did not always agree with, but were trying to make the best of the situation.

North Carolina is in compliance with that plan. The plan calls for a closure of state waters to flynetting with trawls, and a closure south of Hatteras to flynetting. The National Marine Fisheries Service (NMFS) proposal would prohibit the taking or possession of weakfish in the EEZ but would encourage the fishermen to fish for everything else, so it would, in fact, open up south of Hatteras to trawling. Fishermen would be able to just catch the croakers, striped bass, or whatever they are targeting, and throw the weakfish away.

The other part of their proposal is the fishermen would move inshore to target weakfish. This is of particular concern in the context of this workshop, because the more gear that is forced into inshore waters, the more potential there is for interactions. The fishermen do not want that. One of the main ways to avoid that is, on a daily basis, to keep track of what gear is where and do our best to avoid it.

A third issue involves the increase in the number of humpback whales along the coast of North Carolina beaches in the winter. Last December there was an incident off of Rodante at the north end of Hatteras Island where a whale was observed to have gillnet on it. The local rescue squad was called to the scene, went out in their inflatable boat and cut the net off the whale.

I understand from Sheryan that they received commendation for doing that. Unfortunately, they also received a visit from NMFS enforcement agents cautioning them about getting close to a whale. But anyway, because of that incident, I talked with Susan West of the Hatteras Ocracoke auxiliary of the North Carolina Fisheries Association and she contacted individuals at the laboratory in Beaufort and proposed that we get together and set up a team to respond to this type of interaction; set-up a system whereby when if fisherman catches a whale in his net, he can notify the appropriate people to get a response team out there and free the whale. We cannot get close enough due to the boats that we use.

Well, NMFS people really did not realize that we were ready to go ahead and do something right then, so we did not get much response. Susan, again, wrote later in the winter. I had talked to the Coast Guard and talked to the rescue squads. They are very interested in it, if we can get this

meeting to take place and get the people certified to do this, to get near these animals, then maybe we can save some animals that would have drowned otherwise.

We are really on a very local basis facing a double whammy right now. In one case the NMFS proposal would force the fishermen into a situation which might increase these interactions and in the other case NMFS has been a little bit slow to respond to what we saw as a pressing need.

A concern of the fishermen is this: The more we try to be involved in responsible management, the less attention is given to our input. My answer to the question, should the Atlantic States Marine Fisheries Commission should be involved in this process, is probably no. The less bureaucracy we get involved, the better, and it would be better for NMFS to deal directly with the states and with the fishermen, working out the problems on a timely basis.

I think the fishermen in our particular area are probably unique in that they are very much involved in the management, and want to be involved in it. But what is not unique is that they are frustrated with the process right now, and we would very much like to see more commitment by the agencies to solve the problems rather than the commitment to give us more regulation.

Thank you.

Aquaculture and Marine Mammal Interactions off the Coast of Maine

by
Jeff Kaelin
Maine Aquaculture Association

Good morning. I am Jeff Kaelin, Governmental Affairs Coordinator for the Maine Aquaculture Association (MAA). My task today is to highlight for you Maine's finfish aquaculture industry's interaction with the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). Unlike some other commercial fisheries activities, finfish growers interact with marine mammal predators from robust populations of seals, principally harbor seals. They are protected to the extent that the industry is forced by the federal government today, to endure a significant annual expense. The unregulated activities of these animals -- attacking net pens leading to the escapement of cultured Atlantic salmon -- places the industry square in the sights of those who are petitioning the federal government to list wild Atlantic salmon as endangered under the ESA.

Before I go into more detail about this interesting and confounding confluence of federal protected species policies, I would like to thank Lew Flagg, of Maine's Department of Marine Resources and chair of the Commission's Management and Science Committee's Subcommittee on Protected Species, for asking me to be here in behalf of the MAA, and thank the Committee and the National Marine Fisheries Service (NMFS) for holding this workshop to focus on the role of the states in the management of protected species and fisheries interactions.

While we have not polled our membership on the question, I can unequivocally state that those who manage the businesses that I represent clearly favor local decision-making in the resolution of issues stemming from protected species management. Local decision-making is done with the clearest understanding of the impact on and the ethics of those who are challenged every day with producing a living for their families, and creating an economy that benefits their neighbors, within the constraints of the world marketplace that we must compete in to survive

Eastern Maine's centuries-old tradition of hunting animals in the wild for food and controlling natural predators to benefit terrestrial farmers creates a decision-making climate, which can support management decisions that allow for the controlled lethal take of seals in the act of attacking salmon net pens -- as a tool to protect against financial losses -- in combination with other, nonlethal means of deterrence.

In recent weeks, representatives of Maine's Department of Marine Resources (DMR) and Department of Inland Fisheries and Wildlife (IF&W) - with the support of the Commissioners of these agencies - have made this clear in statements to an ongoing federal task force that I will describe in more detail in a moment.

These state agencies have taken a position which some from outside our region may think is difficult, even though it has scientific credibility. Indeed, no one within NMFS, where decision making is more centralized and remote, has publicly taken this position, as the interaction between protected pinnipeds and farm-raised salmon has become a public issue over the past two years.

Our primary recommendation to this group is to pursue policies and initiatives that could return management of robust populations of marine mammal species, recognized locally as nuisance or predatory animals, to the states.

The logic of the 1994 amendments to the MMPA -- which allow up to 10 percent of a "strategic stock" to be taken through human-related causes but does not allow one animal from a robust population to be removed to protect the investment of a new fishing industry -- were viewed by many as a better way to produce fish than by wild harvests.

Maine finfish aquaculturists first placed fish into coastal waters during the late 1970s but the industry's real beginning occurred after a legislative initiative about ten years ago allowed for the sale of 100,000 Atlantic salmon smolts to private interests by the Maine IF&W Department. By 1988, 10 sites produced about one million pounds of Atlantic salmon. In 1993, nearly 15 million pounds of Atlantic salmon had been grown in Maine waters. Last year's production declined slightly to about 14 million pounds, worth nearly $50 million to an area in eastern Maine where little other significant economic activity exists. In fact, Washington County, Maine -- where most of the industry's production is centered around the Passamaquoddy Bay region, bordering New Brunswick, Canada, -- is one of the poorest counties in the United States.

Today in Maine, 21 finfish lease holders lease 52 sites over only about 550 acres of bottom. This activity is supported by eight private hatcheries and at least three processing facilities creating more than 500 jobs in an area where few other employment opportunities exist. When one thinks of the huge expanse of coastline in eastern Maine -- one of the few areas in the world where the potential to grow coldwater finfish is rated very high -- the word "growth" comes to mind. Experimental projects raising halibut and cod are ongoing today. Significant potential exists in this industry yet, to date, the federal government's message regarding predatory seals from robust populations is,"Consider it a cost of doing business."

In terms of the world's production of farmed salmon, some 900 million pounds were raised in 1994. Maine's production was less than 2 percent of the world's total last year. There is tremendous competition in the U.S. salmon market place. Aquaculture has transformed this luxury fish into a commodity product. Our industry's greatest competitors -- Chile, Norway, Scotland, and Atlantic Canada, to name a few -- benefit from government policies that permit the intentional lethal taking of predatory seals when nonlethal means fail to keep seals away from their industries' fish.

In 1993, MAA's finfish committee identified losses from seal predation as one of the most significant economic impediments facing the industry. A spring workshop was held to consider the use of all available means of deterrents and identify any additional methods that could aid the industry in helping to solve the problem. Insured losses alone were identified as approaching 10 percent of the value of the industry's production each year. It was confirmed that most of the seal attacks occur during the winter or early spring, when cold water already stresses fish, leading to expensive losses on some sites. While few fish are actually consumed by seals in this industry, fish are bitten and damaged, are stressed which can lead to mortality or -- perhaps more importantly in the context of this workshop's focus -- are allowed to escape into the wild. At the same time that the MAA began to focus on seal predation as an economic problem for the industry and began to identify the need to ensure that grower's were in compliance with the 1988 MMPA Interim Regime's requirements about reporting lethal takes of predatory pinnipeds, Congress was beginning to focus on the reauthorization of the MMPA.

On behalf of the MAA, I participated in the months long industry/environmentalist negotiations about what form the permanent regime to govern fisheries and marine mammal interactions might take. The MAA's primary goal was to retain the lethal take tool while pledging to continue to work with government and other interested parties in improving compliance with reporting requirements and identifying and deploying other nonlethal means of deterrence which could be successful. Predator nets and acoustic deterrents are widely used in our industry today, resulting in mixed success.

After the moderate environmental organizations, you may be surprised when I tell you I consider even Greenpeace in this category during these discussions, handed our issue to the animal rights groups for further "negotiation", the lethal take option was taken away from our industry.

Maine's finfish growers found themselves to be the only commercial fishing sector in the United States advocating for the continuation of the 1988 authorization to lethally take a marine mammal to protect "gear and catch" after other, nonlethal means of deterrence had failed. While we made the economic arguments, cited the populations we are interacting with as robust, characterized our annual lethal take as conservative, and described the nonlethal means of deterrence which the industry deploys; emotionalism -- not science and sound principles of wildlife management, as called for in the Act -- ruled the day.

Fortunately, Congresswoman (now Senator) Snow, Senator Cohen and Senator Mitchell insisted that our industry at least be given a process for the further study of our problem when the MMPA was reauthorized last year. The establishment of the Gulf of Maine Aquaculture/ Pinniped Interaction Task Force -- whose work is ongoing today -- gives our industry another opportunity to develop recommendations for Congress to help resolve our seal predator problem.

Since March, the Task Force has come to Eastport, Maine, on the Canadian border twice -- to give local growers the opportunity to describe their problem and make recommendations for attempting to mitigate it. I give great credit to the NMFS's Office of Protected Species and to the individual Task Force members, for bringing this process to the local community. Not only did it help ensure broader input from the local industry (two MAA members do serve on the Task Force) but I believe it also gave the Task Force members representing the animal rights point of view a better understanding of the context of the decision to repeal the lethal take authorization.

During the reauthorization process in 1993 and 1994, the MAA estimated that the annual take of seals to protect gear and catch - after other nonlethal means of deterrence had failed - is less than 100 animals. According to a 1993 study, performed by Task Force member Jim Gilbert from the University of Maine, 30,000 harbor seals were identified on the coast of Maine, more than twice the number found in 1986. An 8.7 percent annual rate of growth between 1981 and 1993 has been estimated by Doctor Gilbert allowing one to estimate that nearly 35,000 animals are there today. The potential biological removal number for harbor seals was first estimated earlier this year at nearly 900 animals.

At a Task Force meeting in Portland, Maine recently, someone said that this estimate had doubled to nearly 2000 seals. The Aquaculture/Pinniped Interaction Task Force will send its draft recommendation to NMFS in October with final recommendations going to Congress by April 1996. While we recognize that taking seals in the act of attacking net pens in itself will not solve our problem alone, we are looking forward to a recommendation that will allow some lethal takes to be used as a tool, in combination with a process that can certify that available nonlethal deterrents are being used.

We look forward to recommendations that will involve all interested parties in research to help develop other nonlethal interventions and possibly make funds available for their purchase. We also look forward to a recommendation that will ask NMFS to determine whether or not harbor seals in the Gulf of Maine are at or near their optimum sustainable population level so that the stage may be set for Maine to ask the Secretary of Commerce for management authority over this population.

When this Task Force last met in Eastport in early June, another protected species working group -- involving federal and state officials and industry -- the Atlantic Salmon ESA/NASCO (North Atlantic Salmon Conservation Organization) working group met to continue their discussions about the potential listing of wild Atlantic salmon in several "downeast" rivers.

In addition to discussions focusing on fish health issues, the core issue of concern remains the genetic integrity of the existing wild runs of Atlantic salmon, and competition for habitat as a result of escaped fish from aquaculture operations. While one can debate the idea that there really are significant wild runs of salmon in Maine rivers after some 40 years of stocking

hatchery-reared fish, net pen losses from seal attacks are understood to be the main cause of escapees.

One example of a new initiative to restore Atlantic salmon runs in Maine, which the ESA/NASCO working group has endorsed, is a plan to raise river-specific fish in Maine's two federal hatcheries to smolt size and transfer them to the industry's sea cages to be later released as adult fish. This would help avoid the at-sea mortality, widely recognized as seriously limiting ongoing restoration efforts. What impact does a robust, growing population of seals on the Maine coast have on this problem?

In a letter to Congress earlier this year, Maine's Governor Angus King, writing in opposition to the petition to list Atlantic salmon as endangered, cited a list of ongoing salmon restoration initiatives and stated, "Actions that can be taken within the limits of the State of Maine are being carried out to address this situation."

The Governor's plea is a wise one promoting local management control. Please consider the value and common sense in this approach when making your recommendations to the members of the Commission in October.

Thank you for your attention and for the opportunity to speak to you today.

Participant Q&A and Discussion

MR. FLAGG: At this time I would like to spend a few minutes to take some questions or comments from the audience on the last three speakers. One of the things that had occurred to me that none of the three speakers had mentioned is that fishing gear is expensive and to the extent that protected species interact with fishing gear and destroy fishing gear, it is an economic loss to the industry.

As all the speakers this afternoon have indicated, certainly they have no desire to have protected species entangled in their nets. It does create economic losses to them and it ties them up in time. Obviously, as Bill mentioned, it does affect the efficiency of the gear in fishing for target species. I think that is an important observation, that, in fact, the industry, I think, is very receptive overall to doing whatever can be done within economic constraints to avoid interactions, because it is in their economic interests to do so as long as they can continue to be efficiently catch their intended target species.

That is just the observation that I had immediately about some of the presentations. If anybody else has any questions or comments, we would be happy to take them now.

MR. HARRIS: Jack, I wanted to ask you, one of the things that has been mentioned to us is the possible elimination of night trawling in federal waters. There are people in Georgia who believe that this is a way to possibly reduce interactions in the shrimping industry. What is your opinion on that? Has the fishermen association discussed that? In state waters, of course, we do not allow it, but it does take place out in the federal waters.

MR. D'ANTIGNAC: It also takes place in state waters. By the way, while I am speaking, we do not use hoola-hoops any more, and a TED, properly equipped with the right amount of floats and the webbing and so forth, usually costs between $300 and $400, and we pull four nets, so that is $1500 there, plus we have a couple of spare nets, so it is quite an expensive deal, but everybody has to use them, so we are on a level playing field. There is no problem. We do have a problem with a lot of the imports that are coming from foreign countries that are not complying with any TED rules and paying $18 to $20 a week in wages to the people who either run the boats or have the shrimp farms, so we are up against quite a lot that is not evident on the surface.

MR. PAYNE: Bill, I know most of the weakfish taken in the EEZ are taken off of North Carolina. Can you tell me when that fishery occurs?

MR. FOSTER: The peak of it would be January, February and March. What has happened is that because of the Commission plan's size limit requirements, there is an effort to decrease the take of undersized fish. At the same time, we have had a real resurgence of croakers as an alternative fish. Additionally, we are impacted by the fact that the market for weakfish is

depressed in that it is a limited market as far as fresh fish, especially with New York being closed this past year.

The boats have moved more to the federal waters and targeted croakers and are catching weakfish as part of that, but it is primarily a wintertime fishery. The gillnet fishery right now is primarily a sinknet fishery, where we set the nets and maybe pick them up within 30 minutes or they might sit there all day. It is a matter of fishing the nets back and forth and fishing them over. My concern is that if we force it into the inshore waters that we are going to be forced into a situation where we will start having the anchored nets more in order to get the catch and that would increase the amount of time that the gear is in the water compared to what we are doing right now.

MR. CHRISTENSEN: When you are talking about the effort in federal waters for weakfish, you are not talking a long distance offshore, you are talking a few miles beyond the state/federal boundary, in most cases.

MR. FOSTER: Usually that is correct. We do fish out to a depth of 20 fathoms that might be 10 miles off the beach. Most of that fishery is going to be within five miles of the beach, so the the three mile state/federal boundary is kind of the arbitrary line in the fishery in that it moves in and out with the water temperature and where the fish are and so forth.

MR. CHRISTENSEN: Where is that related to Cape Hatteras, is that north or south?

MR. FOSTER: Both. There is a good bit of fishery that lies south of Diamond Shoals, but most of the croaker fishery occurred north of Diamond Shoals this year; it all depends on water temperature.

MS. COOGAN: What water temperature is critical to weakfish fishing?

MR. FOSTER: That is hard to say, because we deal with surface water temperatures and quite often the bottom temperature is different. Really, we are talking about in the mid-40s to mid-50s, primarily, although I have seen it where the surface temperature would be 43 degrees Fahrenheit and we are catching weakfish, but we are also catching hammerhead sharks, so it is obvious that the water is a lot warmer on the bottom.

MR. HARRIS: Are there other species that exhibit similar behavior as mullet to the stop net gear?

MR. FOSTER: Most fish will to some extent, but it depends on how long they stay there before they either lead around it or go on through it. Even a shadow, like of a pier or such, will herd the fish. So yes, other species do exhibit similar behavior to some extent, although data for that particular fishery indicates the catch to be 90 percent mullet

MR. HARRIS: So the selectivity is when and where you set the haul seine and not a response to the fishes behavior? All the fish are pretty much exhibiting the same behavior?

MR. FOSTER: No, I would not say that. I suspect that there is a difference in behavior, but how much, without being underwater to check and see, all we really can measure is what is caught when that is set. What they did was to set gillnets ahead of it, set gillnets right behind the stop net, and then set gillnets behind the fishing pier, the next fishing pier down, and there really was no difference in the catch either side of the stop net or the other side of the fishing pier in terms of the spot that were also caught in the gillnet. There were just as many fish caught down current from the stop net as there were up current from it.

MR. HARRIS: When they do sit on the mullet, is that a site type decision? Can you actually see them schooled up there, or they just sit periodically all day in front of it? How does it work?

MR. FOSTER: I do not know. I am sure they can see them if there are enough in there. But that other net they are going to set on the tide would -- my guess is they sit primarily on falling water, so they will be able to save the fish, so that the tide would ebb out away from them. That is the way I would do it, based on haul seining I have done on the north beach. We did not use stop nets. We would lay the net out for a certain length of time and then haul the whole net ashore and then set it back.

MR. MUSIC: Mr. Kaelin is any information available from Canada about the numbers of seals that need to be taken to protect the industry up there?

MR. KAELIN: I do not really know. The Canadian Department of Fisheries just ended an experimental permit program with intentional lethal takes. It is not clear that they are going to allow that to happen, again, although I suspect that they will. I do not know the estimates. I would say a couple hundred animals, well under 500 animals, certainly well within the potential biological removal. A lot of people say that is irrelevant: potential biological removal has to do with interactions that are accidental. But we look at it not as a quota but as an opportunity to create a tool. I think the Canadian growers feel the same way. We are looking forward to seeing what their Department of Fisheries has to say.

Reporting is very, very difficult, particularly up where we live. There just are not a lot of people around there. We are taking the position in our organization to try and create compliance.

MS. MURPHY: Just to sort of familiarize myself with this problem, what size fish are they raising in the pens and releasing and what kind of netting are the pens made of?

MR. KAELIN: I do not think the size makes an awful lot of difference. There is a limited size in the sea cages, because the larger fish, the ones that are going to go to market in a year or 18 months are out there, so you might have two or three different sizes.

Most, if not all of the pens use a predator net. All the netting is a polypropylene-type braided twine, the same thing that you would find on codends down here. The predator nets are hung with a weight outside the net that holds the fish, but the seals are quite powerful and they can swim into those nets and no matter how tight they are strung, how much they are weighted, they can invade the pen that holds the fish and take bites out of them. Different techniques are used. If you allow the nets to get dirty and have a lot of algae form on them and hide the fish, that seems to have some effect. But then you have the problem of not getting enough water flowing through the pens to give the fish sufficient oxygen and flushing. It is a really, really complicated problem.

I guess, in hindsight, a task force would have been an excellent way to examine this problem. We are trying to look around the world and come up with alternatives. A lot of people point to a study that was done in Tasmania, where they hang steel mesh on these nets. I cannot imagine the cost and the weight in our region due to the size of the tides.

We have, in the upper areas of Passamoquoddy Bay, 30-foot tides on the Canadian side and the tremendous currents. It is really difficult. We do not really know what to do to be completely protected from the attacks, but the growers feel very, very strongly that once an animal invades their net pen and is threatening their investment, that they should be able to shoot the animal, which is the historic way of taking care of those kinds of problems.

MS. MURPHY: The reason I brought that up is because there is a new material that is very hard plastic that they use in a lot of aquaria like Sea World to keep dolphins separated in large pools. We were going to try it as a mesh over loggerhead nests on the beach, because a lot of times raccoons and pigs will dig into the wire. We were going to try plastic. It is very stiff and very hard, but it is light.

MR. KAELIN: That is really something we have not heard about yet. It is probably incredibly expensive, too.

MS. WANG: You did show, though, that lethal taking should not help the problem, because you just take away and shoot the nuisance animals, but more would move in to take their place. They would still keep coming in from other areas, and this really did not help the problem. So even the fishermen gave up.

MR. KAELIN: There are a lot of fishermen around the world who do shoot seals to protect salmon. You are right, I am not sure that is really the complete answer, but in the short-term we see it as a viable tool that is very easy for us to use.

MR. FLAGG: I would like to add a little bit to what Jeff has said, since I have been working with that task force. Jim Gilbert, who is a wildlife biologist at the University of Maine, has done quite a lot of work. He and several others of us on the committee feel that the attacks of seals on

these sea cages is learned behavior and that it takes time for those seals to get wise to the fact that there is a source of food in there, and yet there are certain individual animals that tend to do that over and over again. I think, based on the fact that there are huge populations of seals in this Down East area and there are relatively small numbers of that whole population that appear to be a problem, that when a seal is removed the problem is gone for a period of time, until another seal eventually learns the behavior and then becomes another problem. I think in the scope of looking at the total population and what proportion of that stock is a real serious problem, it is a very, very small proportion.

DR. MUSICK: Hasn't fish predation by seals been a problem with fish weirs in Maine since God?

MR. KAELIN: Yes.

DR. MUSICK: And haven't they solved the problem just the way you describe it?

MR. KAELIN: Yes.

MR. FLAGG: One of the other things, too, that we had a great deal of discussion about was the fact that in this process the industry did agree that before any type of lethal take should be authorized the industry should be held to certain performance standards. For example, they should be required to do certain things that would tend to lessen the probability of a seal attack.

One of the things that they do now is frequently check the nets with divers, because there are natural mortalities that occur in the nets. The dead fish go to the bottom and if you have a number of dead fish in the nets, it does seem to attract seals to the area more readily. So they have agreed that certainly husbandry practices around the net pen sites can affect the potential for attracting seals and that they can do things to minimize the opportunity for seals to come into those sites.

Some of them use seal bombs to scare the seals away from the area. Others have acoustic devices. Some of the growers have spent a tremendous amount of money to deal with seals in a nonlethal manner.

MR. KAELIN: The National Marine Fisheries Service just published a list of nonlethal deterrents that can be used. Again, I give the agency a lot of credit for including a list of things that make sense, such as acoustic devices. I think hazing with boats, if you have an outboard, you can scare the seals away. This method is a lot more attractive and can be effective around the pen sites.

MR. STREET: What is the frequency of attack and the loss in round numbers? I mean, how many pounds or tons of salmon are escaping and how many attacks -- you say there are 52 sites.

MR. KAELIN: Yes. I do not really know the number of fish that have escaped. Lew might know because they have been putting weirs up in the front of the rivers and trying to count which fish are coming up the rivers that were escapees and which were not. Evidently you can see the difference. We estimated two years ago that we are losing 10 percent of the value of these industries' products every year, which would put it at about five million dollars a year. That figure has been criticized by some people. I think the task force's official estimate now is between four and 10 percent. It amounts to millions of dollars a year.

Escapement is another issue. Let us say that Atlantic salmon are listed as endangered and the whole of the region is identified as critical habitat, our industry is dead. We will not be able to site another pen down there, worst-case scenario. So we really want to solve the problem. I think it is going to be a combination of techniques that is going to do that.

MR. PAYNE: Jeff presents a very articulate view. I do not completely disagree with everything he says. However, there are a few things I think need to be at least presented to balance his presentation. NMFS has not dragged its feet. They have not helped the situation, but this is not a NMFS regulation. Until that changes, we will not take the advance, that is for sure.

Secondly, one of the problems I know the conservation groups have discussed is that you do not have a problem until you place a pen. It is like putting a bird feeder out, attracting squirrels, and then asking the agency to authorize the taking of the squirrels. And more squirrels will come in after the fact. The alternative is to build a better bird feeder, a squirrel-proof bird feeder. If, in fact, the industry is losing five million dollars a year, why can't they put one million dollars into producing a better pen, a seal-proof pen? I mean, that seems like an alternative that would be to their economic advantage. The way it is being presented, it seems like they just want to blow away 100 seals until 100 more come in and they blow away another 100 seals.

This is not an issue, really, of the Commission or of this meeting. Jeff's presentation, his real request, is that this group come up with a recommended policy to return management to states to take robust populations of mammals. Would the states take the responsibility on themselves to shoot those seals?

MR. FLAGG: I do not know.

MR. PAYNE: I just have one more question. You have had three meetings of the task force. Do you think the task force will come out with a recommendation for lethal take?

MR. KAELIN: I think it is going to be difficult, because, unfortunately, for some reason it was decided early on that there would be consensus, and you know as well as I do that two of the individuals on that task force cannot professionally ever go that far, so consensus is out the window.

MS. WANG: What if you tried a plan that will try all nonlethal measures possible and if that does not work, then revisit the lethal issue in a couple of years?

MR. KAELIN: We have tried all methods possible for years and have spent more than $500,000 trying to create deterrents in this business. There are millions of dollars in the water up there. State-of-art deterrents are being used around the world. These are very sophisticated people. The amount of capital that you have to have to put gear in the water to raise Atlantic salmon in today's world market is absolutely astonishing.

MR. FLAGG: I think the point of view the industry would take on that is why not involve limited lethal take under certain circumstances and let us work toward developing a 100 percent effective nonlethal deterrent. That is the issue there, that there is a belief out there that we need to have a period of time to bridge the gap between developing a 100 percent nonlethal deterrent, which we do not have now -- it has been pretty well demonstrated throughout the world that there are a lot of different methods tried, and still they have losses attributable to seal attacks. Their point of view is let us have this interim period, a limited and very highly controlled lethal take provision when all else fails, and work very diligently toward developing 100 percent effective nonlethal deterrents. The people who are interested only in the problem with direct take of mammals, I think, would be, hopefully, willing to work very diligently to make sure that development of nonlethal deterrents happens very rapidly and that the resources be applied to make sure that the research can be done to make that happen.

MR. KAELIN: I have been in the fishing industry for 25 years and I am in it because I feel I am an ecologist, too. I am not one by trade, but I do not like the idea of having to shoot seals. Nobody likes to shoot seals. I do not even hunt. The task force members do not hunt. But the MMPA has worked very, very well for some species of animals and we are very much in support of the act when we are protecting stocks that are in trouble. It is for those species that are not in trouble that we believe need to be regulated differently. This problem is not going to go away and some kind of balance has to be struck.

MR. FOSTER: Sometimes we get so involved in these things that it gets polarized and we cannot really see the issue. Something that occurred to me that seemed like a solution to this that will probably seem totally ridiculous to most people, we have got seals, we have got plenty of seals, and perhaps getting rid of a few of them would help the situation, but we cannot because of the regulations. There is also a good chance that somewhere, whether it is Alaska, Canada, or wherever, we have got a population of people who are on welfare and not allowed to hunt seals in their area. It looks like the solution to this would be to bring in some Eskimos and have them shoot the seals and put the seals up for food. It would be a relatively small take, it would not hurt the population any, it would provide food for them, and maybe be able to save some tax dollars.

MR. HALGREN: Two things, I guess. With any living resource we are all sort of brought up as resource managers to manage the resource, not necessarily protect it. So I have some feeling for the seal problem in a condition where seal populations are probably fairly healthy. So it is a situation that is sort of unique. We are not in a true management scenario. Nevertheless, it does seem that even if lethal taking were allowed, it should be allowed for only a very short period of time, and within that timeframe you would be mandated to find a better way.

But what I really wanted to do is ask the fishermen whether they feel that the industries along the coast look to gear technology to address many of the more significant interactions with protected species?

Certainly, with shrimp trawls I think the industry has gone a long way. With your stop net, wouldn't just making sure that stop net was stretched high, used really strong buoys, a little more weight on the bottom to keep that net taut, allow for the animal to back off so it cannot get so entwined? I think we need to look at things in gillnets, such as pingers, possibly other noisemakers, or something woven into the net mesh itself to allow for echo location to work better.

MR. FLAGG: I would like to take this opportunity to thank the three speakers this afternoon, who have really given us an insightful perspective of what the industry is facing and how they view these issues. Thank you.

SESSION III: MONITORING & MANAGEMENT PROGRAMS

Gulf of Maine Sea Sampling Program*

by
Darryl Christensen
National Marine Fisheries Service
Northeast Fisheries Science Center

First, I would like to make a point that there is a serious lack of communication within the National Marine Fisheries Service (NMFS) as well as with the Atlantic States Marine Fisheries Commission and the states. For example, even though I am basically in charge of establishing NMFS observer coverage for the northeast, I have been unaware of activities that have a direct bearing on where those observers may be needed. Two such recent activities include the annual stranding network meetings and the "Third Annual Atlantic Coastal Dolphin Conference." In addition to the lack of communication between different agencies, there is a lack of communication between different disciplines; and some disciplines, such as economics, are not even represented here.

The original title of my talk was about the Gulf of Maine observer business. Again, as I have briefly pointed out, I cover a lot more than the Gulf of Maine. I cover the entire northeast region, North Carolina up through Maine, and we even have some observers closer to Norway. I thought what I would do is briefly go through the history of the northeast observer program and talk about some of the fisheries and issues that I feel are important to this group.

Prior to about 1989 there was no real at-sea observer or sea-sampling program at Woods Hole. The observer coverage that did take place was funded with some 1988 money we received in a special appropriation to look at problems for the depletion of New England groundfish stocks. The original purpose for the program was to look at the discards of groundfish so that we could improve our assessments of groundfish stocks.

Because of concern regarding the condition of the offshore summer flounder fishery, I diverted some effort to assess effort in the offshore flounder fishery, as well as collect some size frequency distribution data and other data on the summer flounder stock. That was a wintertime fishery with little interaction with marine mammals. None of the basic trawl fisheries in the north have much in the way of interactions with either marine mammals or sea turtles.

By the time we got this program rolling, we confronted the issue of personnel ceilings, and the result was that the initial program consisted of one person on staff and a contractor. We went through a required competitive bidding process and Manomet Bird Observatory became our contractor. The program has expanded rapidly since then. We are doing around 3000 sea days a year.

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* text edited from verbatim transcripts

Before we even got off the ground, the Marine Mammal Protection Act started the requirements for coverage of Category I fisheries. Additionally, what was formerly the foreign observer program, which was run out of the NMFS regional office in Gloucester, was transferred down to Woods Hole and incorporated into the domestic program. This is how we ended up with a sea-sampling investigation program.

When I say it has expanded, it has not expanded in terms of NMFS employees. We have four permanent people, who all moved over from other positions, and we have some temporaries. We have no long-term funding. That is one advantage of not having very many permanent employees on your staff. If the funding dries up, permanent staff can be reassigned and everybody else just disappears. All the actual observers, most of the people who do the data entry and the people who supervise the observers work for our contractor, Manomet. It started out small, fewer than a thousand days, now it is up to slightly over 3000 days a year.

State people should look at other options to run their state programs, because they also have problems with hiring and firing and maintaining and long-term funding. These are problems that NMFS has had to deal with and would have to be dealt with on a state level if states get into an observer program.

Let me go on to the fisheries. Again, we had a foreign fishing observer business. By 1991 that had declined to essentially nothing, although we may, in fact, get back into the foreign observer business. It has been proposed for Atlantic herring joint ventures on Georges Bank. In fact, the Preliminary Management Plan that would allow foreign fishing on Georges Bank for Atlantic herring is in Washington and may well be approved at any moment and we may be back into that business.

Other specific fisheries: the New England sink gillnet. We have been monitoring this fishery since 1989. The thrust of this fishery was to estimate harbor porpoise takes in the sink gillnet fishery. At first the primary area of coverage was the Gulf of Maine, but over the years this area has expanded to encompass the entire New England fishery (down through Rhode Island). Needless to say, there are problems with sampling design, sampling size and cooperation from the industry.

On the other hand, there have been some good efforts. I am sorry Bob McKinnon from the industry is not here. Bob not only serves on the harbor porpoise working group; he actually comes and gives part of the training to our observers when we do the gillnet training session. We have other industry members come as well. We have people from industry do the longlines and trawl sessions. We do make an effort in our observer training programs to incorporate the industry.

The New England sink gillnet fishery has been the single largest fishery we have dealt with in terms of sea days. It is a Category 1 fishery and we clearly put our emphasis here. We have

attempted to do a 10 percent coverage. It was not successful, we never caught up, in a sense. The overall coverage is more like seven or eight percent. We originally tried to apply the coverage just based on historical effort.

Estimates based on that sampling technique had very low precision and wide coefficients of variation, so we went to a stratified sampling system whereby we concentrated most of the sampling into the time and space where the harbor porpoise were located. In the areas where there were no harbor porpoise we assigned zero takes for those areas. This gave us much better precision about the estimates and we went with that system for a couple of years.

From the latest review, this turns out to be a poor way to estimate the take of seals. We need to do a better job of estimating the total take of the various types of seals, and other people ought to be doing a better job of estimating the total seal population. These are clearly going to be issues that industry is going to want to know more about.

It looks like we may go back to doing our sampling, just prorating the sampling across all the areas and all the times based on total fishing effort and not use the distribution of harbor porpoises for a sampling scheme. We are also looking at ways to improve seal take estimates without sacrificing harbor porpoise accuracy.

One of the things I would like to point out is that while I am responsible for putting the observers out, other people do the actual analysis of the information. I receive some analytical support for designing sampling strategies.

Our second big fishery, one we have been doing for a number of years, is the offshore swordfish drift gillnet fishery, not to be confused, as it sometimes appears in the regulations, with shark gillnet fisheries, because those are entirely different fisheries. The swordfish drift gillnet fishery occurs offshore, targets swordfish and is managed under the federal Swordfish Fishery Management Plan. Their quota is now under 100,000 pounds of swordfish, a quota which can be taken in about 200 sets by a fleet of about 15 to 25 boats.

The problem with that fishery is that in those 200 or so sets, mammal take is almost one mammal per set, so it has an extremely high take rate. It includes just about everything that is out there, sperm whale, right whale, humpback, pilot whale, beaked whales of several species, offshore bottlenose, striped, and spotted nose dolphins.

Well, Mike is signaling me to end here. Hopefully, I have provided with an overview of our programs. If you have any questions, I would be happy to answer them.

Participant Q&A and Discussion

MR. HARRIS: Would you describe the swordfish gillnet in terms of its mesh size, length, and depth?

MR. CHRISTENSEN: Keep in mind, in all our observer activities we collect data down to the color of the twine. If there is anything to be observed, it is recorded. The truth of the matter is, a lot of us have not got a clue as to what might be important in the long run.

The fishery operates at night. The fishermen set their nets at night, then haul them back the next morning. The fishery occurs at the edge of the shelf, in the same water longliners target, usually where there is some sort of thermal break. They set a net out and they are staying under the mile-and-a-half limit on that net. The net is made of multi-filament twine and the mesh is usually 18- to 24-inches. The nets are fathoms deep, dropped down into the thermocline layer, and are fished from the surface, or just below the surface. We have tried to talk the fishermen into dropping their nets farther down, so that the float line would be farther below the surface, but that has not happened.

There are about a dozen industry people who are really active in the fishery. A few of these individuals have gotten together with researchers at the University of Rhode Island to test the effectiveness of pingers.

MR. HARRIS: Do you have a shark drift net fishery in the same area?

MR. CHRISTENSEN: A few of the vessels originally tried to target tunas or sharks with this really large mesh gear offshore and they did not catch enough to pay for it. So while there were a few trips early in about 1990 or 1991, no one has gone out specifically for tunas or for sharks with this gear, at least the vessels we know about. And they are all pretty much in compliance. They have their permits, they call in, they have to give us five days notice.

This year we actually had 100 percent observer coverage except for the one person who went out in violation without picking up the observer. In the last few years we have been doing about 50 percent coverage. This is such a short intense fishery that we can make everybody available for the two 10-day seasons.

MR. STREET: Where does this fishery take place?

MR. CHRISTENSEN: Actually, it took place right off of North Carolina, just south of Hatteras, but not this year. Nobody fished down there this spring. For somebody who is interested in shark bycatch, there is some interesting heavy-duty hammerhead bycatch in that fishery. The large mesh apparently snags the heads of the hammerheads very well. The summer fishery is

north and east, basically from Hudson Canyon out to the U.S.-Canadian line. By June and July the swordfish have moved out to the U.S.-Canadian boundary along the southern Georges Bank.

This fishery, again, is one that we have covered every year since 1990. It was actually classified as a Category 1 fishery by our early observer coverage (we had some coverage even though it was not required). It was reclassified and has been required ever since. Following the swordfish drift gillnet fishery, there is a whole series of fisheries which we monitor, not with protected species funds, but with our own add-on funds and from other sources. We cover trawl fisheries in Georges Bank, the Gulf of Maine, southern New England offshore areas, and the mid-Atlantic wintertime offshore trawl fisheries, which target mostly summer flounder but there is also sea bass and squid involved in those fisheries.

We conduct a northern shrimp trawl fishery, which is a small-mesh fishery, wintertime in the Gulf of Maine, and I do not believe we have ever had a protected resources interaction there. We have done some groundfish bottom longline work, and even some coverage of lobster pot fisheries. If we see something different happening and there is an observer is available, they will generally go ahead and take a trip.

We have got trips on fisheries I did not even know existed, for instance, a coastal trawl fishery for horseshoe crabs that operates at the mouth of Delaware Bay. That looked pretty interesting, because I believe we had some sturgeon and striped bass and other bycatch in there, and we put some more time in it, but we saw that only once. The rest of the time it turned out to be clean, so one knows.

As a general rule, I am a firm believer that if one has an opportunity to put an observer on a boat any time, do it.

MR. PAYNE: I have a question along that line. If, in fact, we are trying to pinpoint or be more precise about bycatch of anything, take a species or a non-target finfish species, if an organization like the Commission or one of the states wanted to place observers on one of their interstate fisheries, how would they go about doing it?

PARTICIPANT: It is already there. We have people banging the docks now, looking for fishermen to take them on their boats.

MR. PAYNE: In the shrimp fishery?

PARTICIPANT: No, in any of it.

MR. CHRISTENSEN: In the cases where we do not have mandated coverage, where we cannot go and say, "You have to take us, you have no choice," which is the last resort, as far as I am concerned, we pound the docks looking for people who will take us.

MS. EPPERLY-CHESTER: I have the same question Mike does. If anybody wanted to augment observer coverage or pick up another fishery, can they channel dollars to you to organize and observe.

MR. CHRISTENSEN: NMFS can channel dollars. The Southeast Center channels dollars to us all the time. We do their longline coverage. In fact, even though we do that longline coverage basically from Hatteras north, the money we now receive all comes from the Southeast Center and they, of course, do their own longline coverage from Hatteras south.

MS. BERGER: I was wondering, in total, how many observers you are working with now and what is the cost of the program?

MR. CHRISTENSEN: We are doing about 3000 observer days, which is difficult to translate into number of observers since some observers work regularly and some just infrequently. There are probably 30 to 40 observers available for our contractor to use at any one time. Whenever they feel their supply of observers is getting too low, then we have another observer training session.

In this case, NMFS does the observer training. The annual cost is around two million dollars right now. If you wanted a real cost -- and I say around that, because I spend half my time on observer issues and not a nickel of that is actually charged to the protected resources funds or any other fund. In other words, my base salary comes from the general category of statistics collection. So it is very difficult in many cases to come up with an accurate number for actual cost.

MR. STREET: When we had the first stranding in 1990 and started observer coverage. The next year we tried observers, again, and had some resistance from the industry. We ended up with $30,000 to $50,000 in overtime costs, which was not accounted for in our budget. An observer program is not simple.

MR. CHRISTENSEN: No, and I have been in it since 1989. It pretty much started out our little "trawl observer program." There is still so much to be done and every time you turn around you realize you could have done this better. Anybody who is trying to start up a program, feel free to pick up the phone and give me a call. I will try to discourage you entirely from even thinking about it, and then I will give you all my best reasons why it is not going to work and try to give you some advice on how to do it, but I can tell you more things not to do than to do to set up a program.

MS. MURPHY: I do not know if this question is for you or for Mike Street, but what is the status of the Sargassum harvest fishery and are there any observers on those boats?

MR. STREET: To my knowledge, the fishery is not ongoing at present. The company is still technically in business.

MR. CHRISTENSEN: We have started some summertime coastal trawl fishing. We increased our coastal gillnet coverage in the mid-Atlantic, so we are down in the area, not knowing who to go to get advice on where to sample and what have you. I am leaving it pretty much to our contractor, so we have got people wandering the docks from somewhere unknown in North Carolina all the way up to Long Island trying to arrange trips in fisheries where there is very little summertime activity. We are looking for like 30 days at sea in each fishery. Very little summertime activity in coastal gillnetters.

Again, probably the biggest single problem we have had is we collect so much data, we do not have the software or the data management staff. We are about a year and a half behind in software development, just to enter the data we collected.

MR. KENNEDY: Darryl, have you done any work to look at biases as to how people fish with and without an observer on board?

MR. CHRISTENSEN: Yes, not so much here, but Mike Pennington, who just came to work for me up at Woods Hole, is looking at the biases in sampling techniques. There are some things that popped in the harbor porpoise workshops. There was a significant difference in what was observed as opposed to what the fishermen reported independently.

But the whole thing about bias is a major issue, because under the MMPA, even in the New England sink gillnet,where we have to force our way on the boats. In some cases, you are still not allowed to go on boats that are too small or unsafe, so we miss the mosquito fleet portion. So there is bias. We tend to go on bigger boats and shorter trips and too many trips on the same vessel. We have had tried to say, "No more than one trip per month on any vessel."

MR. KENNEDY: We have done some work looking at biases in shrimp trawl observer data related to familiarity and who you can go with and who will not shoot you if you walk on the dock. But I was questioning, really, your onboard versus not being on board, whether there is any information to show what those biases are. It is easy enough to work with them if you know what they are.

MR. CHRISTENSEN: We spend a lot of time looking at that. Again, with Pennington coming to work for me, we are going to spend even more time looking at the data for those kinds of biases.

MR. PAYNE: There are even biases onboard. In the harbor porpoise program that he mentioned the observers were instructed the first couple of years to monitor a trawl coming back, then skip one, monitor one, skip one, and if you look at the differences in bycatch rates, they are

phenomenal just between those observed and not observed on the same trip. Whether that was real or not, the result was that bycatch estimate increased, because only the on-watch data were used and that worked against the fishermen in that case.

The point that has come out to me in this discussion is that we do in terms of observers and getting observers on board vessels can be improved, especially in state waters. Rather than having people pounding the docks looking for rides, if we could work together with the states to place observers on identified fisheries, it would eliminate a lot of running around and we would probably have a more efficient observer program.

DR. MUSICK: Darryl, in those fisheries where you have to depend on the captain allowing your people to go, do you really think they are getting unbiased estimates? The bad guys are not going to take observers out with them.

MR. CHRISTENSEN: Well, but that is assuming there is a clear distinction between good guys and bad guys and I do not think that is fair. I think we probably do, in fact, get a pretty good representation, because in a lot of cases they perceive that there is no real threat if they take the observers out voluntarily, given that in most cases, no matter what was observed, there probably would not be any violations or anything given out. If they are forced to take us out, then all the rules apply. If they were observed doing things that were against the law on a mandatory trip, that is fair game for enforcement. On a voluntary trip it is not.

DR. MUSICK: So what you are telling me then is you really do not know, in the case of protected species, whether or not your bycatch estimates are right or not, because the guy who voluntarily takes an observer out is not going to go into an area where he knows he is going to catch protected species. A guy who is forced to take an observer out may not go into an area that he would fish otherwise because he knows he might take protected species there. So your estimates of protected species bycatch may be biased low.

MR. CHRISTENSEN: I believe there is a general belief that that is true.

MR. PAYNE: There is a general perception that may or may not be true, but in 1994 we had an estimate of bycatch of harbor porpoise. The New England Fishery Management Council established three closure areas and in between two of the closures in the Gulf of Maine there was an open area. What happened was that fishermen were kind of forced to go into one area to make a living and our bycatch estimate actually went up, even with the closures.

But at least in the sea-sampling program and with regard to gillnetters, the people who administer that program know almost every active vessel in the Gulf of Maine. For the few fishermen who have not taken observers, we can almost estimate their bycatch at a minimum. Over a three-year period, where that problem may have been real the first year, the problem has becoming smaller

and smaller. There are still people who do not take observers, but they can be accounted for in the data.

MS. EPPERLY-CHESTER: To add to that, we were concerned about the effect the observers would have on what the captains were doing in the flounder fishery. Two-thirds of our observers were Darryl's observers during that period of time and, with observers aboard, there were only 26 in compliance with the tow [phonetic] restrictions, so we thought the captains were probably operating pretty much as they would.

MR. CHRISTENSEN: In our voluntary trawl coverage up in New England, commercial fishermen were using liners and crossing into closed areas with the observer aboard. We said, "No, we're not going to report you to enforcement; we're not going to initiate a case."

MS. COOGAN: I was going to support the voluntary nature, because otherwise you are putting these poor observers in this enforcement position when they are not trained to be enforcers, that is not really their job. But I agree that there is, probably, in some cases and in some fisheries a bias. In the Gulf of Mexico last year, a shrimper agreed to take a volunteer with them and he did not use TEDs. So there certainly are cases where they are not fishing differently.

MR. SWINGLE: Just to get a little clarification, are all the fisheries we have been discussing required to report a marine mammal take?

MS. COOGAN: Yes, all Category III's are supposed to report.

MR. SWINGLE: I am just curious how many reported takes there are for a state like Virginia? We had 100 cetaceans on the beach last year, and even from the limited numbers we were able to document that there was an interaction.

MR. PAYNE: I do not know the answer. Our office might have that number, but I am not certain. In the fisheries that have been observed, voluntary effort and take reports usually are lower than number of takes with observers on board.

MR. SWINGLE: I have never heard that number ever given. I think I asked this question about a year ago of someone in the northeast regional office and he said there were no documented takes of harbor porpoise. We had 35 carcasses.

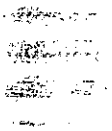
MS COOGAN: We had a documented case of harbor porpoise in the coastal gillnet fisheries in New Jersey following an intense enforcement effort. Within a week we got a couple of more reports.

MR. KAELIN: You have to report only takes that result in serious injury or death if you are a Category 3, I believe. This whole issue came up in the MMPA reauthorization process and it

was clear that there was not good reporting. I think one of the laws now requires the Secretary to develop a postage paid card that can be used to help encourage reporting and there is going to be increased reliance on associations to try to bring their people into compliance by using this simple form. People are hoping that will help.

MS. SILVA: It is also being talked about as including that as part of the requirements for what they have to do for the fisheries anyway on the same form or at least related to that, trying to make it a little easier.

MS. MURPHY: I think it is interesting, the reporting is directly related to the effect on the fishermen. Back before we had TEDs and we were trying to get TEDs, this was a quote I got from a fisherman that is sort of a classic. He said, "I never catch a turtle and even when I do, they are all alive." If it is something that might work against them, they are certainly not going to report it. In the case of the Georgia boats during this gear restriction that has been imposed, they are making every effort to document every turtle they capture to prove the point that the nets are not fishing correctly. They are taking photographs, they are taking videos, they call me on their cellular phones at 7:00 in the morning. Again, I guess it is the motivation that results in whether you get reporting or not.



Marine Mammal Monitoring Programs in the Southeast

by
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Fishery-Interaction Monitoring Observer Programs & Stranding Investigation

The NMFS Southeast Fisheries Science Center (SEFSC) monitors the incidental take of marine mammals using two methods -- direct observation of fisheries and investigation of marine mammal strandings.

Fishery Observer Programs

The SEFSC Charleston, Galveston, Miami, and Panama City Laboratories conduct fishery observer programs. Three fisheries are monitored primarily for incidental marine mammal take by direct observation -- the longline swordfish/tuna fishery in the Atlantic, Gulf of Mexico, and Caribbean; the shark drift gillnet fishery along the U.S. south Atlantic coast; and the shad gillnet fishery in coastal South Carolina waters. The primary goals of observing fisheries are to: (1) estimate the level of marine mammal take, lethal and non-lethal, by geographic region; (2) compare estimates with the level of take being reported by the fleet; and (3) collect samples for life history and other studies. The reef fish, shark longline, and shrimp trawl fisheries are also monitored, primarily for bycatch, in the Atlantic and Gulf of Mexico.

Swordfish/Tuna Longline Fishery

The swordfish/tuna longline fishery was a Category II fishery during 1991 - 1994, and takes of marine mammals were reported through the marine mammal logs completed by the fleet. The observer program (for marine mammal take) was initiated in 1992, but not completely implemented until 1993. The program is designed to achieve five percent observer coverage. The permitted fleet, which consists of approximately 1,400 boats with an active fleet of about 500 boats, fished approximately 16,000 days in 1991 (one set equals one fishing day), 15,000 days in 1992, and 12,000 days in 1993. Takes of pilot whales (*Globicephala spp.*), Risso's dolphins (*Grampus griseus*), and marine turtles have been observed in the Atlantic. Most of the animals were captured alive and were released; however, ingestion of a longline hook, even if subsequently removed, can cause serious injury to a marine mammal. In the Atlantic, estimated fishery-wide mortality and serious injury to pilot whales in the longline fishery averaged eleven pilot whales (CV = 0.33) and 6.5 Risso's dolphins (CV = 0.27) annually during 1992-1993.

Shark Drift Gillnet

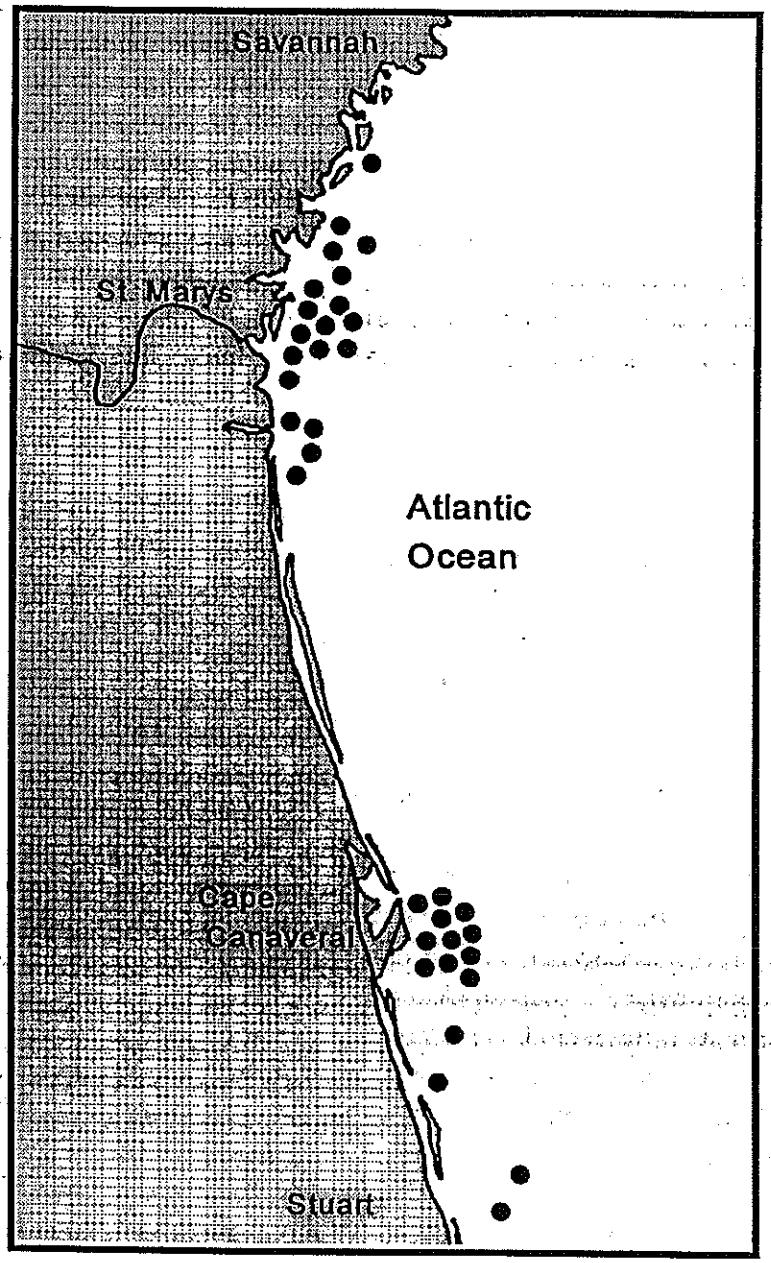
Monitoring of the shark drift gillnet fishery was initiated in 1992. The fleet is small and only 15 boats were known to be active (fishing at least two trips) in 1992-1995. Most fishing activity occurred off Port Canaveral, St. Augustine, Jacksonville, and Fernandina Beach, Florida, and off the southern coast of Georgia (**Figure 38**). The fishery did not carry observers during 1992, but a mandatory requirement to carry observers was in place beginning in 1993. Observer coverage was minimal during 1993 with six trips observed, but increased to 38 observed trips in 1994.

Eight trips were observed during May to June 1995. The coastal migratory stock of bottlenose dolphins, which is listed as depleted under the Marine Mammal Protection Act (MMPA), might account for most, if not all, of any marine mammal take since the fishery occurs nearshore. Although the number of dolphins taken may be low, the fishery requires monitoring because of the potential for significant impact on the depleted coastal stock. The main goals of the program were to: (1) describe the fishery; (2) estimate levels of marine mammal take and compare them with reports of interactions through the marine mammal log system; (3) evaluate methods to reduce bycatch; and (4) collect samples for life history and other studies. No marine mammal interactions were observed, but one bottlenose dolphin mortality was reported by a skipper and two marine turtles were caught and released alive.

Coastal Shad Gillnet

The seasonal, coastal shad gillnet fishery in South Carolina was monitored in 1994. The fishery is open from February 1 through April 2, and is of particular interest because of the potential for causing mortality or serious injury to bottlenose dolphins from the depleted coastal stock. Aerial surveys were used to document distribution of fishing effort and locations of strandings in relation to the effort. The level of effort was also estimated using other indicators (number of licenses, landings, net location, drift, float time). Stranded marine mammals were throughly examined to determine cause of death. Information derived on the shad fishery and marine mammal strandings were examined for possible correlations to determine if any relationship exists. Preliminary analysis indicated that there was no relationship between the coastal shad gillnet fishery and marine mammal strandings in South Carolina. The final report from this monitoring program should be forthcoming later this year in a National Oceanic and Atmospheric Administration Technical Memorandum. The SEFSC has initiated a project to develop an appropriate sampling design for monitoring coastal gillnet fisheries in the Atlantic and Gulf of Mexico. The Northeast Fisheries Science Center is currently monitoring a coastal sink gillnet fishery with observers.

Figure 38. Observed Shark Drift Gillnet Sets during 1993 - 1994.



Marine Mammal Stranding Investigation Program

All of the SEFSC Laboratories, along with the external partners of the Southeastern U.S. Marine Mammal Stranding Network, participate in monitoring marine mammal strandings. Most stranded animals reported are examined for evidence of fishery interaction (e.g., line and/or net marks, attached line and/or net, flukes cut off, etc.) or other human-related cause of death. The proportion of strandings which show signs of human-interaction is closely monitored.

The Southeastern U.S. Marine Mammal Stranding Network routinely provides the SEFSC with stranding records on a near real-time basis. Approximately 500 to 600 marine mammals are reported stranded each year in the southeast region, which includes the Gulf of Mexico, and bottlenose dolphins account for 60 to 70 percent of the strandings. About half of the marine mammal strandings occur in the Atlantic. In addition to monitoring the stranding rate for possible anomalous events, the stranding records provide an index of fishery interactions. Most reported stranded marine mammals are examined for signs of fishery interaction, and these records can be used to derive the proportion of overall mortality attributable to fishery interaction (assuming that cause of death has no effect on probability of stranding.) Estimates of the proportion attributable to net entanglement by state have varied from 0 to over 30 percent, with the highest proportion in North Carolina. The average proportion is approximately 10 to 12 percent overall. Near real-time monitoring also allows identification of possible fishery interaction problems. For instance, a recent increase in the proportion of fishing interaction strandings along North Carolina may be related to a resurgence of a nearshore set net fishery.

Marine Mammal Monitoring: Stock Assessments & Biological Sampling

The SEFSC assesses the status of marine mammal stock throughout the U.S. Exclusive Economic Zone (EEZ) in the NMFS Southeast Region, which includes the coastal and offshore waters of the Atlantic states from North Carolina to Florida and the Gulf of Mexico. The SEFSC also monitors the coastal bottlenose dolphin stock throughout its range in the U.S. Atlantic, which may extend as far north as Long Island, New York. Biological sampling is conducted through the stranding investigation program, through a capture and release program designed to assess the health of local wild bottlenose dolphin populations, and through biopsy sampling in conjunction with ship-based assessment surveys and site-specific monitoring programs.

Marine Mammal Stock Assessments

The SEFSC uses two methods in assessing stock size and status. Site-specific studies are directed at localized, nearshore stocks of bottlenose dolphins. These studies monitor trends in abundance and other population parameters of the localized stocks, as an indicator of population status over a broader geographical area, with the main goal of detecting significant declines in abundance. Small vessel survey and photo-identification are the primary sources of data for the site-specific studies. Large-scale, region-wide surveys are used to determine the status of

bottlenose dolphins along large stretches of the U.S. coast and on the continental shelf, and to determine the status of deep-water cetacean species such as the pantropical spotted (*Stenella attenuata*) and sperm whales (*Physeter macrocephalus*) at the continental shelf edge and over continental slope waters. The region-wide surveys employ both large vessels and aircrafts to collect sighting distance data for providing abundance estimates with coefficients of variation of about 20 percent for the more common species. Both the site-specific and region-wide surveys were designed as long-term studies.

Site-Specific Studies

Site-specific studies of bottlenose dolphin stocks are currently underway at six sites in the southeast region. There are four along the Gulf of Mexico coast, including areas in Texas, Mississippi and Florida. There are three sites along the Atlantic coast, one each in Florida, and North and South Carolina. These studies have been underway from two to six years. Sampling varies by area nearly continuous to only at annual low and high abundance periods. Data analysis are not complete, but no significant changes in abundance trends have been noted.

Region-Wide Surveys

Coastal and continental shelf waters were divided into five zones -- three in the Gulf of Mexico and two in the Atlantic. One zone is surveyed by aircraft each year during a five-year study period. Approximately 100 hours of survey flight time are required annually, resulting in visual survey of about 9,000 to 10,000 kilometer of transect line each year, and usually more than 100 sightings. Bottlenose dolphins are the predominant species observed. The continental shelf surveys replicate surveys conducted from 1982 to 1986. Results of the current surveys will be compared with the earlier surveys for trends in abundance and distribution when a sufficient number of surveys have been completed to allow a statistical trend analysis.

A large-scale ship-based survey of U.S. Atlantic EEZ waters south of Cape Hatteras was conducted in 1992 and another is planned for next year. These surveys are intended to provide data to allow assessment of stock size for deep-water cetaceans over the continental slope and continental shelf edge. There is a major impetus to provide as accurate as possible stock size estimates for cetacean species, such as pilot whales and Risso's dolphins, which are known to interact with fisheries in this area.

Large-scale, region-wide surveys were directed at deep-water cetaceans in the northern Gulf of Mexico in 1992 to 1994. These surveys were a major part of a study to evaluate cetacean distribution and abundance and relationships with environmental variables. Vessel surveys, conducted during the spring-summer beginning in 1990, were used to visually sample U.S. EEZ waters off the continental shelf. Oceanographic data were also collected. Approximately 6,200 kilometers were visually sampled each year, resulting in more than 250 sightings of marine mammals annually. At least 21 species of cetaceans have been observed, and bottlenose

dolphins, pantropical spotted dolphins, Risso's dolphins (*Grampus griseus*), and sperm whales were the most frequently sighted species. Aerial surveys were used to seasonally sample a subset of the vessel survey area in waters from 100 to 2,000 meters in depth offshore of Texas and Louisiana, an area which may be subject to future mineral exploitation. A total of eight surveys were conducted over two years. Approximately 6,300 kilometers of transect were visually sampled each survey. The number of sightings per survey have varied from 24 to 51, with the lowest sighting rates in the fall, and the highest in the spring.

Biological Sampling

Biological sampling is directed primarily at bottlenose dolphins through the stranding program and a program of live capture and release of bottlenose dolphins. Biological samples of other species are also obtained through the stranding program and through biopsy sampling at sea. The samples obtained from stranding are used primarily for life history, genetics, histopathological, and contaminant studies. Live capture sampling is directed at modeling condition indices of site-specific stocks as an indicator of ecosystem health. This is accomplished through clinical evaluation of health status of individual animals. This sampling involves primarily hematological and contaminant studies, ultrasound examinations, and physical exams. Biopsy sampling at sea is used for genetic characterization of species and stocks.

Stranding Investigation

Biological samples of bottlenose dolphins and other species are obtained on a continuing basis through the stranding program. Specific studies to date include food habits analysis, age structure, stock structure, contaminant analysis, and histopathology. For instance, age has been determined for several hundred bottlenose dolphins which stranded during unusual mortality events. In addition, histological samples from bottlenose dolphins were used recently to identify a possible morbillivirus epidemic in the northern Gulf of Mexico.

Live Capture & Release

Live capture sampling and release of bottlenose dolphins was conducted in Matagorda Bay, Texas, during the summer of 1992, and a second live-capture sampling program is currently underway in North Carolina. In Texas, a total of 36 dolphins were sampled to evaluate the overall health status of the local population, which had suffered an apparent unusually high mortality event earlier in the year. A model, which utilizes hematological and other physiological parameters, has been developed for assessing health status of sampled stocks. The results of the Matagorda study were compared with a long-term sampling project conducted in Sarasota Bay, Florida, by the Dolphin Biology Research Institute.

At-Sea Biopsy Sampling

Biopsy samples are collected at sea on an opportunistic basis. In addition, biopsy samples for genetic characterization are collected during live-capture operations, and will be collected as part of the site-specific low-level monitoring studies currently underway. Biopsies obtained from marine mammals at sea will be used in conjunction with stranded specimen data to develop genetic profiles of marine mammals, such as beaked whales and pilot whales, which are difficult for NMFS observers to identify to the species level. This will allow more accurate characterization of marine mammal-fishery interactions. Samples obtained from Atlantic bottlenose dolphins during site-specific monitoring will be used to attempt to better define stocks.

SESSION IV: DEVELOPMENT OF WORKSHOP FINDINGS & RECOMMENDATIONS

Participant Discussion: Developing a Cooperative State/Federal Protected Species Monitoring & Management Program

MR. FLAGG: At this time I would like to invite to the front table my two partners in crime who assisted me with this subcommittee in developing this workshop, Bruce Halgren of New Jersey, and Jim Music from Georgia. What we are going to attempt to do in the next hour and a half is to talk a little bit about how we might collectively go about developing cooperative state/federal protected species monitoring and management programs. Before we launch into that we need to first talk about what some of the workshop findings and conclusions, in terms of the issues and ongoing activities.

I am going to throw out a couple of thoughts that I quickly jotted down as the last speakers were making their presentations, thinking back to some of the things that have been presented in the past couple of days. One of the things that came across very clearly is that our ongoing protected species monitoring and management programs are providing important data and these programs need to be continued and expanded.

In that regard, there should also be increased communication between protected species personnel and state and federal fishery resource managers. In this meeting it has been pretty evident that there is not a good dialogue between the people who are doing protected species research and those who are affected by it in terms of resource management. So I would suggest that that is certainly a real need.

The other thing that I recognize as a result of this workshop is that certainly protected species/fishery interactions are coastwide in nature; they affect all the Atlantic coast states to one degree or another. From the information presented here, there is no state in which protected species/fisheries interactions do not occur. Those are a couple of thoughts I had. I would be interested in what some other people's thoughts and conclusions are relative to the workshop. Any comments, suggestions?

DR. MUSICK: Yes, the monitoring programs in these various states need some kind of firm, dependable support. Funding varies drastically from state to state. Some states have a very dependable funding source, other states have a peripatetic funding source. Florida DNR appears to have at least a steady funding source, although they need more money --we all need more money.

Sally talked about the Section 6 money varying a lot. At least she has Section 6 money and there is a well-established and supportive system in her state. In the State of Virginia we had some startup money from NMFS way back in 1979 and 1980 and then the nongame program that is administered by Game and Inland Fish started up. That was a typical tax write-off plan where

you contribute part of your state tax return to the nongame program. Then part of that money was given to our turtle program at VIMS to monitor turtle strandings and to do aerial overflights.

In about 1989 or so, the State Legislature allowed three or four other major programs to be put on the tax form. Consequently, the amount of money available to Game and Inland Fisheries declined by approximately two-thirds in a matter of a year or so. Of course, they kept most of that money in-house and our program has not been funded since. In essence, I have been running the program because I have had people on my payroll who are paid to do turtle research and impact research by people like the Army Corps of Engineers Management Service. I got the money from the Army Corps of Engineers, for instance, to do aerial overflights, but that is not the same thing as monitoring year to year to try to assess population changes.

The Chesapeake Bay is a particularly important place because there are 5000 to 10,000 loggerheads there every summer. These turtles are between six and 12 years of age and could give us an idea of whether all the conservation work that is going on in the southeast is having an effect, because if it is, we will see an increase in our population estimates long before those turtles return to the nesting beaches, which takes 25 years. Right now there is no funding for that. The state is not about to put any money up with the Governor that we have in power right now. We are not even allowed to use the term "endangered species."

MR. HALGREN: Jack, you said, I think, two things. State monitoring programs require a stable funding source and more work needs to be done on population studies.

MR. KAELIN: I am interested in hearing a discussion about the difficulty that some states have had getting ESA Section 6 assistance because no one agency had sole authority to manage the resources involved. The reason I am raising this issue is because the ESA is up for reauthorization and it looks like a very clear statutory requirement that there be an agency. Perhaps that could be addressed so that you could accomplish the same thing, ensure that the state had the ability and the will to do the job and do not be so strict that you have to have all your responsibilities in one agency. I do not know if that is a real issue or not.

MS. MURPHY: I do not think that is the issue. They can sign a cooperative agreement within a university, they can sign one with a state agency.

MS. SILVA: In Section 6 you can have more than one division of the state's hierarchy on the cooperative agreement. They just have to have authority for conservation and management efforts of endangered species. But it could be a division of marine fisheries and a division of fish and wildlife, for example, on one agreement, but they have to have authority by state law to deal with those species.

MR. PAYNE: I have a question on this, Laurie. The federal agencies, U.S. Fish and Wildlife Service or NMFS, can authorize funding under only one Section 6 agreement to a state. You

cannot have two separate entities within a state. The money goes to one place and you have to have a cooperative agreement in the state to share that money somehow.

MS. MURPHY: Yes, you have just got to have the right laws and the right programs in place in order to get it approved.

MS. SILVA: A university, like a state university, could be funded through the state agency. In fact, some of our work that is being done on turtles in the northeast is through a consultant, but the money comes through the Section 6 agreement they have with the state. As far as transferring the money, that is not as difficult as getting an agreement set up.

MR. HALGREN: One of the things we want to try to do with this workshop is to make some recommendations to the Commission. We can give some background information, we can put together recommendations pretty easily. A lot of people presented some really good thoughts here. Did anybody buy any of them? Are there any conclusions we can make? Are there specific problems or research needs that must be addressed? That is what I think we are looking for. What kind of conclusions did the group make from the presentations that were given?

DR. MUSICK: Darryl has got to put some observers on gillnet vessels off Virginia. He has got to do that in March and April on the ocean side and then in May and June inside Chesapeake Bay on the eastern shore and in the ocean. That involves the shad fishery and the spiny dogfish fishery in the cooler months, with a focus on the mortalities in *Phocoena,* and a focus on the red drum fishery in the spring where loggerheads are taken.

MR. FLAGG: I think Bill Foster mentioned a very good point --that there is a great need to identify, quantify, and document all sources of losses of protected species, not just fishing-related losses but all sources of losses. I think that is a point that should be addressed.

MR. SWINGLE: I would like to see the Commission establish a protected species subcommittee that would bring in fishermen from different fisheries that you have interstate FMPs for to review protected species issues relative to those fisheries. A lot of those recommendations would go forth in the planning process.

MR. HALGREN: It might serve our purposes more if we reach consensus on workshop findings and conclusions before we make recommendations.

DR. MUSICK: I think another thing that came out of that session yesterday was the idea that the Commission plan should follow the lead of Council plans in having a section that addresses endangered species impacts.

MS. BARCO: I think the idea of finding our where the protected species are and where the fishers are and where the efforts are in each state all together, the seasonality of the species and

the seasonality of the fisheries would be an important first step to determining what things might need to be looked at.

MS. EPPERLY-CHESTER: I agree with Ms. Barco that we have a real need to characterize each state water fisheries with respect to protected species interactions. Perhaps the states, through the Commission, are in the best position to do that, for example, what amount of effort there is, identify fishing seasons by gear type so we can then relate that to what we know about the distribution of the protected species.

MR. THEILING: Technology in the fishery for the purpose of protecting protected species. While I am on, let me ask, there is an organization called the South Atlantic Fisheries Development Foundation that is funded through the National Marine Fisheries Service, and a great deal of their work is in gear development.

MR. FLAGG: In New England there used to be, but I do not think there is a lot of activity in that area any more. We used to have a group in our state that worked quite closely with the industry on new technology development and utilization but that program was completely cut out due to funding

MR. THEILING: In the reauthorization of the Endangered Species Act, is there a portion in it that requires technological studies or considerations? If not, perhaps there should be.

PARTICIPANT: There is the New England Fisheries Development Association that has been funded extensively for programs like Saltonstall-Kennedy and they continue to be for gear technology.

MS. MURPHY: I would be cautious about focussing too much attention on identifying other sources of protected species mortality for two reasons. One, the National Academy of Sciences in their study of sea turtles delineated all the sources of mortality for turtles, so that has essentially been done for turtles. Secondly, most of the recovery plans address this, too.

It sorts of gets you bogged down in minutiae when the fishery is really the major cause, in most instances. The distribution of the strandings, the timing of the strandings, if you do the overlay and look at the strandings, they will tell you which fishery is involved.

MS. SCHROEDER: I agree with Sally. I would only disagree in that there are certainly other sources of significant mortality that deal with nesting beach habitat degradation, for example, and photopollution and such, but that is not the charge of this committee, that is not the charge of the Commission. Those threats are well identified for turtles. I suspect they are for marine mammals, listed species and recovery plans and other documents.

That is not something that I would recommend that the Commission spend time on, because it is already there, and certainly there for turtles. It does not mean that we are not addressing those other problems with nesting beach habitat in another form. This is a constant discussion. If we are at a hearing on lighting ordinances, the homeowners on beach front property are saying you need to be addressing fisheries problems. Well, but that is not what we are here to talk about. We know that they exist, but that is another forum. I think this will bog the Commission down and I do not think it is in their purview.

MR. FLAGG: But it is germane to the issue, because in the implementation of management regulations that always becomes a criticism, so we cannot ignore the fact that there are these other sources. As long as we can identify them.

MR. FLAGG: I guess one of my reasons for saying that some losses documented here reported that up to 35 percent of the causes of death were undetermined.

MS. SCHROEDER: You will never find that. Never

MS. WANG: Actually, if you did the statistics on the number that could be determined and show that out of 100 you can determine 50 positive deaths, so that really ups your percentage of fishery interactions if you are looking at only those 50. So the real picture is probably worse.

DR. MUSICK: This harkens back to what I said in the beginning and that Bruce reiterated, that the state monitoring programs, both stranding and overflight programs, need some kind of stable funding base, because those sources of mortality change from year to year. The dredging problems down in Georgia showed up insidiously at first, until they were recognized. They would not have been recognized unless there was somebody there monitoring strandings. The fall flounder fishery mortalities, if a stranding network had not been there to follow what was happening in real time to know that these turtles came up during these weeks and the fishery was operating offshore during the same time, nothing would have happened.

Somebody might have walked the beach two months later and found 70 or 80 turtle carcasses and it would have been too late to find out. That is why I think we need the numbers up there, and Bruce stated this, is to make sure that the established monitoring programs have some form of stable funding base.

MR. PAYNE: I would like to at least recommend for tomorrow's discussion of this committee that a protected species standard be considered for use in the Commission's fishery management plans.your Interstate Fisheries Management program Charter.

The reason I say this is because it is a little stronger statement than just establishing a committee. I think it has been recognized by the people in this meeting that there are still a lot of people who either do not believe or do not want to believe that there are problems out there.

Even if people ignore the standard, if it is front of them, it will creep in and they will pay attention to it. If it is not a standard and it is not right up in front of you, you can continue to ignore it for as long as you want to. I would like it to be discussed tomorrow.

MR. HALGREN: I think one conclusion that I was led to inevitably is that there are fisheries/protected species interactions that cause mortality throughout many different gear types.

MS. BERGER: Before we had this workshop I had the sense that many committee members did not know the extent and magnitude of the problem and were unsure whether it was something the Commission should address. It seems pretty clear from our discussions over the last couple of days that there is a problem, a fairly large one, we just don't know how large. I would like to get a feel from the MSC members whether you see it as a problem, whether you think the Commission should address this, or it should go to the states and be handled individually. I think that was the major question we had going in to this workshop, so I would like to see some answers to that.

MR. STREET: Let me just speak as chair for a moment, and I have told this to the committee already. When we had the meeting last fall, I was kind of skeptical, very honestly. I came away from the presentation, though, with a little different attitude -- a considerably different attitude -- and felt that it was appropriate that we follow up and see if there was a role for the Commission.

The purpose of this workshop is the education of a group of us here -- I regret that more members of the committee are not here. We have 21 members of our committee. Four of them are federal, the remaining are state people. I think it is apparent that there are some substantive problems out there. There are interactions from Maine to Florida. The Commission is a body composed of the states from Maine to Florida. When the members vote ultimately on an issue within the Commission, the states vote. The federal members of the various species boards and policy boards do not vote. The states vote.

There are obviously problems within states, there are obviously problems that are within state jurisdictions for which various states have laws that are enforced from zero to 100 percent. I think there is definitely a role for the Commission. I think it is going to take some time to find that role, and I appreciate very much the assistance and the patience from the federal people here and from the state people in those states that have been able to do some work.

There is an awful lot of information out there and I think there are gaps in information. But remember that people on this committee and most of the people who work within the Commission are fishery managers not researchers. The members of this committee are at the level which translates research and data into policy for the directors of the agencies, for the regulatory commissions, for those who make the decisions

Bill Foster here is not just a member of our Marine Fisheries Commission in North Carolina, he is the vice chair. He makes policy for the State of North Carolina. He is a working commercial fisherman, he sees this every day on the water. He is on a committee for the South Atlantic Fishery Management Council. We are dealing with very, very real issues here, where it is far more than going out and collecting information; it is, in fact, using the information in decisions. We need to ensure that there is a reasonable level of confidence in the information.

You as researchers have been dealing with things about which it is very difficult to get data. Monitoring is the best way to get data, and because of the life history strategies of many of these species, you are not going to do it in one year and you are not going to do very well in 10 years. That is a very, very long-term monitoring program. I think the Commission, which has recently reorganized its staff and has a Research & Statistics Program, under Lisa Kline, can begin to address some of the issues and concerns raised here.

There is no doubt that when you do something coastwide on the order of relatively rare events, which these interactions are, in fact, there is a very high cost per unit of information. There are very real practical considerations. This lobby for a stable funding base for coastwide monitoring may be the highest priority, but I think we need to go on with looking at things that need to be done, and let us look at it from the context of the whole Atlantic coast and what an interstate group can do, remembering that the various state agencies have differing authority, that the National Marine Fisheries Service has an overriding authority but a very limited ability to implement that authority.

For better or worse, those who will be affected are far more amenable to working at as local a level as they can, and I think we can work some things out. There is still a lot more education to go, but I think we have made a good start here.

MR. FLAGG: It seems to me, too, that one of the conclusions that we could arrive at as a result of this workshop is that most of these species are highly migratory in that they migrate between various political boundaries both within states and various states' boundaries as well as within the jurisdiction of the regional councils. In order to manage these protected species, there is going to be some need for coordination amongst those different jurisdictions to provide for effective management. What those mechanisms may ultimately be, I do not know, but I think we can certainly conclude that there is a need to have coordinated management amongst those various jurisdictions.

MR. PAYNE: If the committee recommends to the Commission to proceed, and it sounds like we will recommend something to do with protected species issues. Mike was very correct in stating that NMFS has very little authority in state waters, yet under the MMPA and ESA we are required to manage these protected species populations in areas where we have very limited authority -- at least under the MMPA, not under necessarily ESA.

MS. MURPHY: I am not sure if I have all my thoughts together, but based on what Mike Street said, the only thing I disagree with is when he said these are rare occurrences. Those of us who spend weekends and holidays and get calls at midnight do not consider these rare occurrences.

MR. STREET: It is a relative term.

MS. MURPHY: Real relative. I am new to the workings of the Commission and I was talking with Dale Thieling today at lunch. There are some things I think the Commission can do. There are other management options that we clearly need the Councils to do for issues that fall out in federal waters.

I have a question about the Commission's fishery management planning process. If a state does not come into compliance with a Commission fishery management plan, are they restricted in that fishery? To me, if the Commission does not include some sort of protected species standard to be met in these management plans, then it is really not going to be very effective. Why get involved if there is no incentive for states to do something? Yes, we have the two federal acts, but it really comes down to implementing management plans. What these species need most, at least those that have been well studied, is management, not more research. It is management that is going to recover them, not research. We can study them until they disappear.

Unless there is some sort of standard for protected species in each one of these management plans, then we are not going to accomplish much. I think the whole issue should be approached from either a gear perspective or a fishery perspective. I do not think it should be looked at as species by species from the protected species side, that is why my presentations and a lot of the presentations here focused on the fishery first.

MR. KENNEDY: As a member of the committee, what you are saying is you would rather see a section in the various fishery management plans dealing with endangered species than the Atlantic states trying to develop an endangered species plan?

MS. MURPHY: Yes, I think they are just going to be duplicating efforts that have already been done with recovery teams and recovery plans and management plans. Your focus is the fishery and the gear and that is where it needs to be dovetailed.

MR. HALGREN: Just for clarification, I wrote down that you suggested the Commission fishery management plans need protected species compliance standards, not necessarily to be addressed in the plan. There is a very, very significant difference between addressing it in the plan, which might require seasonal closures and changes in gear type versus a compliance standard of whatever that might be, X animals. I do not think you are going to get the latter. That is only my guess.

MS. MURPHY: That is my impression. That is why I am bringing it up.

MR. LESSER: Just as with the habitat question. Everybody wants to address habitat, but no state would make it a compliance factor, because you do not have complete control over habitat. I do not know about other states, but I know the State of Delaware would not make it a compliance factor, something we had no control over, especially when we do not know the degree of the problem. What is significant about it in terms of the fishery? Before we would restrict the fishery to protect the species, we would have to know the significance of that harm. To me, that has not been demonstrated yet here today. It is a problem but nobody has related the severity of it overall.

MS. COOGAN: Regarding making it a compliance standard, I agree that it should be a standard identified in the plan, but making it a compliance standard implies that you are authorizing a certain level of take and the Commission has no authority to authorize a level of take. I guess I have a problem with whether it should be a compliance issue.

MR. FLAGG: I think, too, the other point is about the fishery management plans, the individual plans relate to compliance with respect to conservation of that particular species. It is directed toward that species, so the measures that have to be taken relate to conservation of that particular target species for which the plan is written.

MR. PAYNE: A statement was just made as to whether or not protected species issues have been dealt with at this meeting at a level that they should have been to monitor fisheries. That was not the role of this meeting. I think if we can recommend establishing a group within the Commission that works with protected species issues at the fishery management planning level and determine whether or not that fishery takes protected species at a level of concern.

What we tried to do at this workshop was present a broad range of issues to provide you with the full scope of what could be considered, but nobody has gotten to a point where we say this fishery is taking levels of turtles at a level where we could close it. That was not the intent.

MR. FLAGG: I think, too, one of the points that Bill Foster made earlier today was a very good one, and that is that probably fishery resource managers should, in the context of making decisions relative to changes in existing fisheries, consider relocation or changes in seasonality of fisheries with an eye toward minimizing impacts on protected species.

MR. EPPERLY-CHESTER: That is getting back to something we discussed yesterday regarding the impact of a particular takes. What was recommended was that for endangered and threatened species that there is a form of consultation under the guidelines of Section 7. It is through that process that you identify whether or not the take would result in a jeopardy opinion.

MS. COOGAN: Someone brought up whether or not the take was severe. If this were a federal fishery management plan that coastal gillnet fishery would be coming under some requirements under the Section 7 consultation. A level of take would be authorized with associated

requirements to minimize that take, preferably requirements as part of the management strategy. At least initially, that would be the preferable way to handle it if we could find a way to minimize impacts. Because this is in state waters, NMFS has not done anything or offered to do much. The mechanism for doing it is through Section 9; you know, jumping on everybody's toes. We want to avoid that. That is where getting problems acknowledged in a Commission plan is so important -- it is hard to not write in management measures to minimize impacts once they have been acknowledged.

MR. SIMPSON: I guess one point I felt was missing a little bit is population level assessment of the effects of bycatch or take. That was difficult for me to ascertain from what was presented. I understand there are takes in about every fishery, but to put it in the context of the population of the stock in question, that was what was missing, and that is going to become a major component of any FMP. If you want to bring this issue into a fishery management plan, we would have to have that. I would think this would also lead directly to this potential biological removal rate, and that translates into state-by-state quotas on take by species. I am sure there are other alternatives.

MS. BARCO: I think a recommendation that was discussed yesterday to address particular types of gear or particular protected species and how they are affected by certain fisheries is still an important issue.

For instance, I think several people have expressed concern over large mesh gillnets. In Virginia, there is the black drum fishery, and I have heard several people discuss the shark dogfish fishery (I do not know whether that is a state fishery or not or whether it is a fishery in every state). I think those are very important to look at.

MR. FLAGG: It seems like one of the other issues, too, may be that certain gear types in certain seasons are not a problem for protected species, so it really gets down to fine tuning of the process, because I do not think anybody could really make a blanket statement that a certain gear type needs to be eliminated because of a particular problem.

MR. FOSTER: I have been sitting here trying to figure out where the fishermen are going to come into this process other than being identified as the problem. I would like to be the solution. One of the main things I think that needs to be done is if fishermen are going to be involved at all, they have to be involved at the very, very earliest stage, which is analyzing the data that are collected.

Unfortunately, in most of our fisheries management plans they do not get into the process that quickly. In the Commission process, by the time things come out of the technical committee and the advisory panel gets to see them, things are already messed up enough where they never get corrected in the worst-case scenario. I have had similar problems with South Atlantic Fishery

Management Council's advisory process -- the advisory committee does not get to comment on a plan until after it was already written.

So if the fishermen are going to be used, they need to be used at the very earliest stages to identify problems. It can be done at that level prior to spending four or five years trying to collect data to put the numbers down to justify taking action, whereas if we work at this right, we can do things much quicker, in one sense. In another sense, we might not be in a crisis all the time; we might be able to identify some areas that may not necessarily be in crisis.

MR. FLAGG: Good point.

DR. MUSICK: I think it is important that information that is already available or is being collected at the present time about interactions between the protected species and certain fisheries be made available to the Commission management committees that are determining the management strategies for those species. One thought that comes to mind is the intercept fishery for shad. I know that the Commission has been wrestling with the problem of whether to close that fishery or curtail it in some way because of competition with traditional fisheries up in the estuaries and rivers. It seems to me that if you plug that information in along with the *Phocoena* mortality data, then that is another additional reason why you might want to close that fishery.

MR. THEILING: This is probably going to extend the workload a little bit, but it follows right along with what he just said. We have heard a great deal of information about fisheries and protected species in the last couple of days, but it is going to be a rare person who can carry that home in his head.

I think the goal I have in mind is a characterization of the interactions between an animal and a fishery, whether it exists or does not exist being the first question to be answered; in other words, a formatted characterization of every possible interaction. This information would be in a format that characterizes the interaction that exists as well as: What state is it in? What is the economic value of the fishery? What is the status of the protected species involved? Is there a recovery plan in place for the various species involved? Is there a fishery management plan under the Commission, is there also a Council plan in place? Who collects data for the National Marine Fisheries Service in the state? I know you cannot enter all that at this point and it is going to extend the work beyond today and tomorrow in order to do it that way. The Management and Science Committee could use it. The members of the Commission and of the various technical committees and boards certainly will need to see that. Another thing is the relative importance of these interactions. Right now I could not tell you whether the seal/salmon interaction is more critical today or whether it is the sea turtle/gillnet interaction in the big picture. Which one is more critical? Which one should be dealt with first?

MR. PAYNE: Again, that was not the intent. If you want that kind of priority, I think we could do it.

MR. THEILING: Well, I use the word "priority" last. The characterization should come first and maybe the prioritization would prove useful later on.

MR. PAYNE: Let me ask, how long does it take the Commission to develop a fishery management plan?

MR. STREET: A year to a year and a half.

MR. PAYNE: A lot of what is being discussed seems to me to be a subset of things that this committee would be doing during that year and a half. Even before that, maybe. The comment was that fishermen should be involved; within the fishery management plan that affects them, they should be involved from the beginning.

The harbor porpoise/gillnet issue is a good example. It has been going on for six years. We are now at a point where we are thinking about some closures that do not affect the number of days they can fish but where they can fish. Nobody was excluded from the closures. But it is a long time coming and a lot of these things that sound like we are going to have this stuff tomorrow, it should be a subset of that committee to work on these within an FMP.

MR. STREET: The protected species people here have provided a lot of information to the Commission folks that we did not know. I think there is a lot of information about how the Commission works with the management planning process that you all do not know. Let me just give you a couple of things about it.

It is in the the Commission's Interstate Fisheries Management Program (ISFMP) Charter, which I showed the group yesterday, which I understand is going to be part of the final report (see Appendix B). Fisheries are species-based. The ISFMP Policy Board of the Commission is made up of one representative from the states plus National Marine Fisheries Service and U.S. Fish and Wildlife Service. The primary task of the Policy Board is to determine the priorities for preparation of those plans. There are 17 plans right now.

Various plans are in various states of amendment and there are one or two new ones under way. The total number of plans to be prepared eventually will probably reach 25. Many of the old plans were done almost totally without fishermen participation. The Commission had very real problems in involving the public. One of the reasons is that it was a very ad hoc process -- I helped design it in 1980. Under the Atlantic Coastal Cooperative Fisheries Management Act public participation is required. It is a multi-step process. Once the Policy Board determines that a plan is needed, or an amendment, then a team is assembled to prepare a brief document, which then goes out for public review. It is essentially a scoping document. Then it goes back into the actual preparation of a detailed plan.

What we are talking about is a way to incorporate protected species concerns into the process as early as possible. That is the central issue.

I do not think you will find the Commission amenable to changing or adding to its fishery management standards. However, it may well be possible that within the sections that describe the plan contents that some changes can be made. As Charlie Lesser said, habitat issues are very important, but because none of the state fisheries agencies along the Atlantic coast have habitat authority and it is impossible to make habitat a compliance issue. You could go back and penalize the state's fishermen and state's agency for something over which they have no control or authority and that is foolish. It will accomplish nothing. The protected species authority is primarily a federal authority, even though various states have laws... Still, under the federal Constitution, federal laws have primacy.

MR. HALGREN: That is because the federal law says it can.

MR. STREET: What needs to be worked out is a way to have a cooperative mechanism of authority, where it is appropriate, within the context of a given fishery management plan and a given interaction. That is something that is going to have to be worked out step by step.

One of the questions is are those interactions significant? We have heard in this meeting about two significant species -- harbor porpoise and bottlenose dolphin.

PARTICIPANT: And sea turtles.

MR. STREET: For Kemp's ridley, but I do not know if for loggerheads if the takes are enough to prevent population growth? There has been no intent to give it for every species. It is a fishery-by-fishery and species-by-species issue. I think one thing we need to see in the future is continued interaction between this committee, or wherever the responsibility lies in the Commission, and the protected species people, possibly a series of mini workshops addressing specific issues to develop the plan and to develop the program.

MS. COOGAN: It is kind of which comes first, the chicken or the egg. If we do not know the extent of the fisheries, we cannot tell you the extent of the impacts. What has been presented here are the types of fisheries that tend to impact protected species. Those are gillnet and bottom trawl fisheries. Depending on the season, the species that will be affected will be different. Some of the trap/pot fisheries will also impact protected species.

However, we should note that none of the takes of endangered species in these non-federally permitted fisheries are legal. Regardless of whether or not it is a jeopardized population, every loggerhead taken in a coastal gillnet fishery is illegal, and the fishermen are the ones who are somewhat in jeopardy there and could be held accountable. The Section 10 program and these

other programs gives us a way to make those takes legal and usually require that some types of modifications be done, but right now they are not legal.

MR. SIMPSON: What prevents the fishery from being shut down today?

MS. COOGAN: We do not want to do that. We want to develop a management program that reduces the impact and that also gives them permission for incidental take under some conditions.

MR. LESSER: That strikes a nerve. I have dealt with enough permits and permitting agencies over the years and I have found that federal laws, such as the Endangered Species Act, shut down more projects because of personalities. You can go from district to district within the Corps of Engineers and have to deal with whole different set of standards for permit reviews and zero tolerance provisions. That is what scares me. If I had to go back and negotiate with the fishermen over seasonality based upon an emotional argument over tolerance levels, I do not know how I would prevail. There is ample opportunity to get involved and we finally have a vehicle where we can see the light at the end of the tunnel to manage fisheries, and it scares me that when satellite agencies want to jump on that vehicle to meet their objectives. I want to go very slowly on that.

It took us 10 years of kicking and screaming to try to get away from voluntary compliance and I hate to overkill it now with the threat of your fishery is illegal if you take one turtle. That scares me and it scares fishermen very much.

PARTICIPANT: But that is already there.

MR. LESSER: I know that, but it scares fishermen.

MS. COOGAN: We have not pursued that, because we realize that is not the best way to approach the problem.

MR. LESSER: Let me repeat. I have been through enough permitting with personalities that take the opposite attitude, that "I can shut you down if I want to." And it happens.

MS. COOGAN: This is a policy that we have had for 10 years now, since 1973. We have not pinged on individuals unless they were doing blatant, intentional, and obvious sorts of things. We certainly have not shut down this fishery, although we have documented takes. We have not done it and we do not intend to.

MR. FLAGG: I think that points out one of the problems that I see in some of the federal legislation, which the fishing industry has not been closely enough involved with to make the case for what the potential impacts are, that there are severe economic repercussions associated with some of these, and that it is really very important in the derivation of these various laws to have

a wide array of input, so that people can realize what the implications are of a zero tolerance situation.

MR. PAYNE: I have never really understood completely -- this is based on the gillnet experience in the Gulf of Maine -- whether the fishermen are as afraid of protected species issues as the agencies are of discussing them. It is a tough issue on both sides. I am not trying to make light of the Commission or anybody, but if they are brought into the process early and all the options are weighed and we try to find mitigating issues all the way from the beginning, the issues usually are mitigated at a level much lower, or tolerable, at least, than waiting around and trying to bring up the issue because we are afraid of discussing it because you might get shut down because of zero tolerance, which does not exist.

I have never heard of a fishery that have shut down because of a take. In the Gulf of Maine gillnet fishery, a fishery where we know the take is three times more than what can be sustained, the gillnetters have not been closed out of one day of fishing. Not one day. Even though we have been screamed at by every organization and every agency that is trying to enforce the ESA for the past four years. We have been trying to work with the gillnetters. It may not end that way, it may not be a pleasant ending. I am not trying to hide the fact that it may be closed down, but I will bet they are going to be closed down because of Amendment 7 before they are because of the ESA. It is like being afraid of fear, afraid of being afraid. It is real and every person has that, and we have got to get past that.

MR. HALGREN: I think that discussion is exactly one reason why we are here and why protected species need to be addressed in fishery management plans, so that it is made part of the public record, that it has been recognized and addressed to the best of the Commission's ability or the Councils' ability, so that those kinds of things do not end up being forced, where you continue to not address it until some point in time when a fishery is shut down because of litigation or some other reason. I think it is important to start addressing them reasonably in fishery management plans.

MS. MURPHY: Talking about getting fishermen in at an early stage, the first Georgia jumper I ever saw was in 1986. If we had had the Georgia jumpers in the early 1980s we could have saved thousands and thousands of sea turtle lives. But there was foot-dragging by a lot of people and we did not get Georgia jumpers into nets in a meaningful way until 1990. That was four years lost. The fishermen know the gear, they know the species, they know the area. The only thing they need to know is that they have to come up with a solution. If they do not realize that, then they will keep on operating as business as usual, and nothing will change. They can come up with the solutions, providing they know they have to come up with the solutions.

MR. SIMPSON: I have a question about how you folks see this playing out. For an individual fishery, such as the shrimp fishery, you can identify the problem and potentially identify a solution. There are numerous fisheries operating, thousands of fishermen, potentially. No one

group can have that control. It seems to me that eventually it comes down to the biology of the animal: What removal rate can be tolerated?

MR. PAYNE: How do you do it for fish? You have the same problem.

MR. SIMPSON: You set quotas, that is what I am getting at, in one form or another. Then it becomes an allocation issue between different fisheries sectors.

MR. PAYNE: Mike mentioned the two stocks of marine mammals that I brought up which are under question because of MMPA changes recently. The potential biological removal rate, for all practical purposes, is a quota. How that is allocated, I do not know. We have not tested it yet. It is going to take a while to play out. What I would recommend is that if the Commission goes forward with this process, we start with a plan. We start the process at a low level and see how it builds up. If we fall on our face, it is not going to affect the Commission a great deal; it will affect one fishery. If it works, we go back and review the others and we work with the fishermen and start over.

MR. STREET: Let me back up about a year and a half. These discussions are fairly similar to what we have had in habitat. We developed an approach to habitat that the Commission utilize Amendment 5. That has a fairly standardized and quite comprehensive approach to habitat. There are no compliance requirements. What it seems to me we are going to have to do is probably find one of the 17 fishery management plans, or maybe a new one that is being developed, and try it. Shad and herring may be the one. The amendment is just getting under way. We have to come up with our recommendations and we are already working on that right now.

MR. PAYNE: I think the protected species component of this workshop needs to realize two things. One, the Commission cannot answer all our problems (it can answer problems within its own mandate); and two, if there is a fishery in an individual state that takes protected species at a level we are concerned about, it does not preclude us from going to that state independent of the Commission. In terms of marine mammals, harbor porpoise is on top of the list. There are two states that we know of that take porpoise that we are concerned about, Virginia and North Carolina, plus everything in the Gulf of Maine. We may have to work with those two states on developing how to reduce bycatch independent of the Commission.

MS. COOGAN: I see the establishment of a Commission protected species subcommittee and incorporation of protected species issues into fishery management plans as a much-needed mechanism for increasing communication that right now is obviously not happening because we are all restricted by time and everything else. Becoming part of the Commission process where 15 states come together regularly to meet and talk with each other is an incredible advance in communication.

MR. FLAGG: I think one of the things, too, and Dale Theiling alluded to it earlier, is it would really be helpful to us as resource managers if the people working on protected species could give us sort of a chart, a matrix of the species -- current status, where it is on a seasonal basis, whether it is inshore or offshore during certain seasons, what gear types are liable to interact with protected species. I think that would give the states some idea about what we are dealing with.

MS. WANG: A lot of that information is in the stock assessments for marine mammals. It is not in a chart form, but each species is identified for gear types that we know.

MR. FLAGG: I think the idea of putting it in a chart form with all of them together, a resource manager can look at that and immediately can say, well, in the fall, I have got to worry about four different protected species and here is where they are, generally, and these are the gear types that they interact with, these are the things I have to be concerned about.

PARTICIPANT: I say this half-heartedly but there is a lot of truth in it, and that is that I think a lot of those data are available. I would be willing to trade you, I will give you data if you can somehow give me similar information on fisheries, how many people are in them or where they fished. I think that is a reason why we are here. You folks may have that information.

MR. FLAGG: I think to some extent you will find a lot of that information in the interstate fisheries plans.

MR. FIELD: I think it also may be instructive, and certainly staff could do this at the Commission in Washington, to compile a status report on the different fishery management plans we have -- which are up for amendment now, which of those FMPs may easily be intervened in right now, if they are in the amendment process, and which have been dormant for a number of years.

MR. FLAGG: Any other points anybody would like to make? Well, I would like to take this opportunity to thank you all for coming to this workshop. It has really been very enlightening for me. I appreciate the enormous time and effort all the presenters have put into the program over the last two days. I am appreciative of the fact that we could have some industry people here, too, to give a point of view that I think is very important.

I would like to thank Mike Payne and the National Marine Fisheries Service, and particularly Tina Berger with the Commission for helping put this together, and my two colleagues up here, Jim Music from Georgia and Bruce Halgren from New Jersey, for helping out. I think we will make some progress. I am encouraged that your efforts are going to pay some dividends here and I am looking forward to working with any or all of you in the future, and if I can be of any assistance to you at any time, please feel free to call me.

Mike Street and the Commission's Management and Science Committee will be holding a meeting tomorrow to further deliberate on these issues and try to come up with draft report of some recommendations that we can forward on to the Commission. I am encouraged that we are going to be able to address these issues, and I think it is imperative that we do so.

Report of the Management & Science Committee to the Atlantic States Marine Fisheries Commission on the Management of Protected Species/Fisheries Interactions in State Waters

Introduction

The Management & Science Committee (MSC) of the Atlantic States Marine Fisheries Commission convened a workshop on *The Management of Protected Species/Fisheries Interactions in State Waters* in Richmond, Virginia on July 17 & 18, 1995. For the purposes of this report, protected species are threatened or endangered species under the Endangered Species Act (ESA) and marine mammals under the Marine Mammal Protection Act (MMPA). Participants included members of the MSC, representatives of state, federal and academic organizations involved in protected species research and regulation, and representatives of the commercial fishing industry. Objectives of the workshop were to: (1) disseminate current information on the status of federal and state laws; (2) identify and quantify problems relative to protected species; (3) provide information on current status of protected species; (4) identify data gaps; and (5) develop recommendations regarding the role that the Commission can play in the management of protected species in state waters.

Background

The ESA and MMPA mandate that the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) implement measures to manage protected species throughout their range in U.S. waters. Such species are taken as bycatch in most Atlantic coast fisheries, including those which occur in state waters. While not all fisheries interact with protected species, such species have been shown to be present, at least seasonally, in the waters of all Atlantic coastal states. Further, protected species are known to interact with one or more fisheries in almost all jurisdictions participating in the Commission's Interstate Fisheries Management Program (ISFMP).

Statement of Problems

- High levels of fishing effort and high densities of protected species overlap in state waters.
- Mortalities of protected species have been documented with many fishing gears used in state waters.
- The best available data indicate that several protected species cannot sustain current levels of fisheries-related mortality.

- Effective protected species management in state waters by NMFS and USFWS cannot be achieved without expanding cooperation among the federal agencies, the Commission and the jurisdictions that participate in its ISFMP.

- The Commission has not established policies relative to protected species interactions with managed coastal fisheries.

Findings

- Fishing is one of a number of activities that adversely impact protected species.

- Protected species/fishery interactions result in mortalities across many gear types and fisheries.

- Improved communication between protected species managers, state and federal fishery managers and fishery users is essential.

- State and federal fishery monitoring programs for bycatch of protected species are inadequate.

- Gear technology and selectivity research needs to address protected species interactions.

- The migratory nature of protected species and coastal fishery resources necessitates regional coordination to address interactions.

- The Commission's fishery management planning process needs to address protected species impacts.

Recommendations

The Commission should establish policies and programs to address the bycatch of protected species by taking the following actions:

- Amend the ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management planning process;

- Develop a coastwide state/federal cooperative bycatch monitoring program to include protected species;

- Re-activate the Commission's Conservation Engineering Committee to provide guidance regarding gear modifications to minimize protected species/fishery interactions;

- Obtain stable funding to support coastwide state/federal cooperative bycatch monitoring and conservation engineering research in partnership with the fishing industry as appropriate;

- Expand the Commission's education & outreach program to include developments in ESA and MMPA and Commission fishery management plans as they relate to protected species issues;

- Include NMFS and USFWS protected species representatives on species technical committees, and plan development and review teams;

- Charge the MSC with overall responsibility for coordination of Commission activities regarding protected species;

- Coordinate protected species activities, as appropriate, with the Regional Fishery Management Councils;

- Increase Commission involvement in the re-authorization of ESA and MMPAwith regard to fisheries/protected species issues; and

- Address protected species issues on a plan-by-plan basis, using the Shad and River Herring Fishery Management Plan as a model.

Conclusion

On November 2, 1995, the findings and recommendations of this report were presented to the Commission's Executive Committee and ISFMP Policy Board for consideration. All of the above recommendations were adopted, although some recommendations were given greater attention than others. Specifically, the ISFMP Policy Board placed greater emphasis on those recommendations that would most immediately assist the Commission in addressing protected species issues in its fishery management planning process. Those recommendations were to: (1) amend the ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management planning process; (2) include NMFS and USFWS protected species representatives on species technical committees, and plan development and review teams; (3) coordinate protected species activities, as appropriate, with the Regional Fishery Management Councils; and (4) address protected species issues on a plan-by-plan basis, using the American Shad and River Herring Fishery Management Plan as a model.

In adopting the above recommendations, the Commission through its ISFMP Policy Board, composed of a representative from each of the 15 Atlantic coastal states, the Potomac River Fisheries Commission, the District of Columbia, NMFS and USFWS, fully recognized the

importance and growing urgency (due to MMPA deadlines) of addressing protected species issues as they apply to state and interstate fisheries management.

Since November 1995, the Commission has amended its ISFMP Charter (Section 6(b)(2)) so that protected species/fishery interactions are addressed in the Commission's fisheries management planning process (see revised and approved Charter in Appendix B). It is intended that protected species issues would be addressed much the same way as habitat issues are currently addressed in the Commission's fishery management plans. This means that each fishery management plan would contain a section which describes protected species issues relevant to the fishery in question. This section would most likely include: a list of protected species (both marine mammal and sea turtles) that may interact with the fishery, the type of interaction (by gear, region, season), a review of the population status of relevant protected species, a list of existing and proposed federal regulations and actions pertaining to the relevant protected species, potential impacts to Atlantic coastal state and interstate fisheries, and an identification of current data gaps and research needs. None of the items addressed in the protected species section would require mandatory compliance under the Commission's fishery management planning process.

The Commission has also begun to develop a standard outline and format for inclusion of protected species issues in Commission fishery management plans beginning with the American Shad & River Herring Fishery Management Plan, which is currently under amendment. Additionally, NMFS and USFWS representatives with protected species expertise have been incorporated into the Commission's species technical committees, and plan development and review teams. The Commission will continue to implement the remaining workshop recommendations as resources become available.

APPENDIX A

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APPENDIX B

INTERSTATE FISHERIES MANAGEMENT PROGRAM CHARTER

Section One. Introduction and Policy

(a) **General**. The Atlantic States Marine Fisheries Commission was formed in 1942. The purpose of the Commission is:

....to promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries, and by the prevention of the physical waste of the fisheries from any cause. It is not the purpose....to authorize the states joining herein to limit the production of fish or fish products for the purpose of establishing or fixing the price thereof or creating and perpetuating monopoly.

(b) **Interstate Fisheries Management Program**. The Commission carries out an Interstate Fisheries Management Program, authorized by Article IV of the Commission's Rules and Regulations.

(c) It is the policy of the Commission that its Interstate Fishery Management Program promote the conservation of Atlantic coastal fishery resources, be based on the best scientific information available, and provide adequate opportunity for public participation.

Section Two. Role of the Commission

(a) **General**. The Atlantic States Marine Fisheries Commission is responsible generally for the Commission's fishery management activities. These activities will be carried out through the Interstate Fishery Management Program established under this charter.

(b) **Final Approval Authority.** The Commission will be the final approval authority for:

(1) any fishery management plan or amendment; and

(2) any final determination of a State's non-compliance with the provisions of a Commission-approved fishery management plan.

Section Three. ISFMP Policy Board

(a) **Membership**. The Membership on the ISFMP Policy Board shall be comprised as follows:

(1) the Chair of the Commission, Vice-Chair of the Commission, the Chair of the Commission's Legislative Appointees, and the Chair of the Commission's Governors' Appointees shall each be a voting member;

(2) one Commissioner from each State, except for the States represented by the Chair and Vice-Chair, designated by that State's delegation to the Commission, shall be a voting member;

(3) one representative from the National Marine Fisheries Service and one representative from the United States Fish and Wildlife Service shall each be a voting member;

(4) one representative from the Potomac River Fisheries Commission and one representative from the government of the District of Columbia shall each be a member, eligible to vote, on any matter which may impose a regulatory requirement upon their respective jurisdictions; and

(5) one representative of the Commission's Law Enforcement Committee shall be a non-voting member.

(b) The Chair and Vice-Chair of the Commission shall respectively be the Chair and Vice-Chair of the ISFMP Policy Board.

(c) **Role and Functions.** The ISFMP Policy Board will be responsible for the overall administration and management of the Commission's fishery management programs. In this regard it will:

(1) interpret and give guidance concerning the standards and procedures contained in Sections Six and Seven, and generally provide Commission policy governing the preparation and implementation of cooperative interjurisdictional fishery management for coastal fisheries of the Atlantic coast;

(2) establish the priority species to be addressed by the Commission's fishery management program, taking into account the following criteria:

(i) the species constitutes a "coastal fishery resource" as defined in Section 803(2) of the Act;

(ii) the degree to which the species is of importance along the Atlantic coast; and

(iii) the probability that the species and associated fisheries will benefit from cooperative interjurisdictional management;

(3) establish Management Boards described in Section Four;

(4) review and approve declarations of interest in species management by states according to the standards contained in the Commission Rules and Regulations;

(5) review fishery management plans and amendments prepared and approved by management boards and sections described in Section Four, and, if it finds that they are in conformity with Section Six, recommend to the Commission that they be adopted;

(6) monitor and review the implementation of fishery management plans for which no management board or section is currently operational;

(7) review and approve action plans, including priorities for activities, for the ISFMP;

(8) establish, for any matter that does not come under the purview of an existing Management Board, a committee to provide it with any relevant analysis, reviews, and recommendations;

(9) recommend to the Commission that it make a determination of a State's non-compliance with the provisions of a Commission-approved fishery management plan, according to the procedures contained in Section Seven;

(10) consider and decide upon appeals of states to actions of any management board under Section Four(h); and

(11) take any other action that is consistent with this charter and that is necessary and appropriate to carry out the fishery management program of the

Commission; except that a final determination of a State's non-compliance with the provisions of a Commission-approved plan must be made by the Commission.

Section Four. Management Boards

(a) Upon determining that a need exists in a fishery for the development of a fishery management plan or amendment, the ISFMP Policy Board shall establish a Management Board for that fishery. A Management Board may be disbanded by the Policy Board upon a determination that it is no longer needed for the preparation, review, or ongoing monitoring of the implementation of a fishery management plan or amendment.

(b) **Membership**. The voting membership of each Management Board shall be comprised as follows:

(1) one Commissioner from each State, designated by that State's delegation, with an interest in the fishery covered by the Management Board shall be a voting member;

(2) one Commissioner from among the Legislative Appointees and one Commissioner from among the Governors' Appointees may be appointed as a voting member by the respective Chairs of those sections; except that such members on any Management Board may not come from the same state;

(3) a representative each from the Potomac River Fisheries Commission and the District of Columbia may elect to serve as a voting member on a Management Board for any fishery in which it has an interest or which may result in the imposition of regulatory requirements on their respective jurisdictions; and

(4) one representative from each of the National Marine Fisheries Service and the United States Fish and Wildlife Service may elect to serve as a voting member of any Management Board.

(c) **Functions**.

(1) With respect to the fisheries under its jurisdiction as established by the ISFMP Policy Board, each Management Board shall be responsible for the development of a fishery management plan or amendment. In the development of such plan or amendment the Management Board shall keep the ISFMP Policy Board apprised of progress and consult with the ISFMP Policy Board on significant

questions of fishery management as they arise. Each Management Board shall provide the ISFMP Policy Board with any review or recommendation that the ISFMP Policy Board requests.

(2) During the process of fishery management plan proposal, development, or amendment, Management Boards shall solicit public participation by submitting fishery management plan drafts to each interested state for public comment prior to the approval by the ISFMP Policy Board.

(3) With the approval of the ISFMP Policy Board, a Management Board may, after the necessary plan or amendment has been approved by the Commission, continue to monitor the implementation and enforcement of the plan or amendment, advise the ISFMP Policy Board of its effectiveness, or take other actions specified in the plan that are necessary to ensure its full and effective implementation.

(4) Each Management Board shall select its own Chair and Vice-Chair. The Chair of Management Boards will rotate among the states on a bi-annual basis, with the Vice-Chair acceding to the Chair.

(d) **Atlantic Menhaden Board.** The Atlantic Menhaden Board, which shall have all of the same functions and responsibilities with regard to Atlantic menhaden that are contained in subsection (c), shall, unless changed by amendment to the Atlantic Menhaden Fishery Management Plan, be comprised of the following:

(1) five Commissioners from different states that have an interest in the Atlantic menhaden fishery, and five industry representatives to represent different sectors of the industry; appointed by the Chair of the ISFMP Policy Board with due regard being given to the geographic range of the fishery; and

(2) one representative each from the National Marine Fisheries Service and the National Fish Meal and Oil Association.

(e) **South Atlantic State-Federal Fisheries Management Board.** The South Atlantic State-Federal Fisheries Management Board shall serve, at the direction of the ISFMP Policy Board, as the Management Board for species that are of predominant interest to the South Atlantic states. The members of this Board shall be:

(1) one Commissioner from each of the States of North Carolina, South Carolina, Georgia, and Florida, designated by that State's delegation, shall be a voting member;

(2) one Commissioner from any other State, designated by that State's delegation, may serve as an ad hoc voting member with respect to any matter which may impose a regulatory requirement on that State;

(3) one Commissioner from among the Legislative Appointees and one Commissioner from among the Governors' Appointees of the states listed in the preceding paragraph may be appointed as a voting member by the respective Chairs of those Sections;

(4) the Regional Director of the National Marine Fisheries Service (Southeast Region) and the Regional Director of the United States Fish and Wildlife Service (Region 4), or their designees, shall be voting members; and

(5) the Executive Director of the South Atlantic Fishery Management Council shall be a voting member.

(f) **Sections under Amendment One.** Under Amendment One to the Compact creating the Commission, one or more states may agree to designate the Commission as a joint regulatory agency; and the Commissioners of these states shall constitute a separate section for these purposes. In any such instance the following procedures apply:

(1) Agreements among states under Amendment One shall be in writing, and open to participation by all states with an interest in any fishery to which the agreement applies.

(2) All Commissioners from states forming a section under Amendment One shall be members of the section.

(3) Regulatory authority exercised by the Commission under Amendment One shall be carried out pursuant to a fishery management plan prepared according to this Charter. For these purposes, including determinations of non-compliance under Section Seven, a section shall have the same authority and responsibility as set forth in this Charter for a management board.

(g) **Coordination with Regional Fishery Management Councils.** Each Management Board shall work with appropriate committees of the Regional Fishery Management Councils and appropriate federal officials to insure that state and federal fishery management programs are coordinated, consistent, and complementary. It will be the policy of the Commission to develop fishery management plans jointly with Regional Fishery Management Councils wherever possible.

(h) **Appeal Opportunity.** Any state that is aggrieved by an action of the Management Board may appeal that action to the Policy Board in accordance with Section Three(c)(10).

Section Five. Staff, Management, Technical and Advisory Support

(a) **Staff Support**. The Commission's Executive Director or the Director of the Interstate Fishery Management Program shall serve ex-officio as non-voting members of all Management Boards. Commission staff shall serve as ex-officio members of all Technical Committees and will chair the Plan Development Teams and Plan Review Teams. Staff will provide liaison among the Management Boards, ISFMP Policy Board, Plan Development Teams, Plan Review Teams, Stock Assessment Committees, Technical Committees, Management and Science Committee, Law Enforcement Committee, and Advisory Panels.

(b) **Committee Organization.** Unless otherwise specified, each group included in this section shall elect its own chair and chair-elect (or vice-chair), which shall rotate bi-annually among the Committee members, with the chair-elect acceding to the chair. Committees shall maintain a record of their meetings compiled by the chair-elect (vice-chair) in consultation with the chair and Commission staff.

(c) **Management and Science Committee.** The Management and Science Committee is a standing ASMFC committee appointed by the Commission. The Management and Science Committee carries out assignments at the specific request of the Commission, Executive Committee, or the ISFMP Policy Board, and generally provides advice to these bodies concerning fisheries management and the science of coastal marine fisheries. The Management and Science Committee is comprised of one representative from each member State, the NMFS Northeast and Southeast Regions, and the USFWS Regions 4 and 5 who possess scientific as well as management and administrative expertise. Among its duties for the Commission, the ASMFC Management and Science Committee shall:

(1) serve as the senior technical review body of the ISFMP Policy Board. As such, it shall be available to review and comment on any product of the Plan Development Teams, Plan Review Teams, Technical Committees, and Stock Assessment Committees, including action plans, species priority lists, stock

assessments, and economic and social analyses; and

(2) with approval of the ISFMP Policy Board, establish subcommittees or other work groups as are necessary to ensure that the best scientific information available including biological, social, economic and environmental information, is used in developing, implementing, and maintaining fishery management plans and amendments, using a multidisciplinary approach.

(d) **Plan Development Teams** shall be appointed by the Management Boards to draft fishery management plans and plan amendments.

(1) Plan Development Teams shall be comprised of personnel from state and federal agencies who have scientific and management ability and knowledge of a species and its habitat, and an interest in the management of species under the jurisdiction of the relevant Management Board. Personnel from regional fishery management councils, academicians, and others as appropriate may be included on a Plan Development Team. The size of the Plan Development Team shall be based on specific need for expertise but shall generally be kept to a maximum of 6 persons.

(2) It shall be the responsibility of a Plan Development Team to prepare all documentation necessary for the development of a fishery management plan or amendment, using the best scientific information available and the most current stock assessment information. Each fishery management plan or amendment shall be developed by the Plan Development Team in conformance with Section Six of this Charter.

(3) In carrying out its activities, the Plan Development Team shall seek advisement from the appropriate Technical Committee, Stock Assessment Committee, Advisory Panel, and the Law Enforcement Committee.

(4) Following completion of its charge, the Plan Development Team will be disbanded or assume an inactive status until reconstituted/reactivated by the Management Board.

(e) **Plan Review Teams** shall be appointed by the Management Boards to provide advice concerning the implementation, review, monitoring, and enforcement of FMPs that have been adopted by the Commission. The size of the Plan Review Team shall be based on specific need for expertise, but shall generally be kept to a maximum of 6 persons.

(1) Each Plan Review Team shall at least annually or as provided in a given fishery management plan, conduct a review of the stock status and states' compliance with the implementation requirements of the fishery management plan for which it was established. The Plan Review Team shall report all findings in writing to the Management Board for appropriate action. Compliance review shall be consistent with the requirements of Sections Six and Seven of this Charter and the respective fishery management plan requirements. When a plan amendment process is initiated by the Management Board, the Plan Review Team will continue its annual review function applicable to the existing plan.

(2) In carrying out its activities, the Plan Review Team shall seek advisement from the appropriate Technical Committee, Stock Assessment Committee, Advisory Panel, and the Law Enforcement Committee. The Management and Science Committee will be consulted as appropriate.

(f) **Technical Committees**. A Management Board may appoint a Technical Committee to address specific technical or scientific needs requested periodically by the respective Management Board, Plan Development Team, Plan Review Team, or the Management and Science Committee.

(1) A Technical Committee shall be comprised of state, federal, Regional Fishery Management Council, Commission, university or other specialized personnel with scientific and technical expertise and knowledge of the fishery or issues pertaining to the fishery being managed, and shall be constituted on a multidisciplinary basis as appropriate.

(2) It shall be the responsibility of a Technical Committee to provide scientific and technical advice to the Management Board, Plan Development Team, and Plan Review Team in the development and monitoring of a fishery management plan or amendment as requested in writing, including evaluating fishery dependent and fishery independent data and providing information on the status of the stock and the fishery to the Plan Development Team and Plan Review Team.

(3) Among its duties, the Technical Committee shall provide a range of management options, risk assessments, and justifications, and probable outcomes of various management options.

(4) The Technical Committee will coordinate the process of developing stock assessments for Atlantic coastal fisheries, including coordination with stock

assessment and review processes of the National Marine Fisheries Service and the Fish and Wildlife Service. Upon the request of a Management Board, the Technical Committee shall appoint individuals with appropriate expertise from a pool of individuals to a Stock Assessment Committee, which will report to the Technical Committee and shall continue in existence so long as the Management Board requires, to carry out the following functions:

(i) conduct a stock assessment for use by the Plan Development Team in formulation of a fishery management plan or amendment; and

(ii) conduct periodic stock assessments as requested for use by the Technical Committee in reporting status of the stock to the respective Management Board.

The Stock Assessment Committee shall use the best scientific information available and established stock assessment techniques. Stock assessment techniques should be consistent with the current state of scientific knowledge.

(g) **Advisory Panels**. A Management Board may at any time request that the Commission's Committee on Advisors establish an Advisory Panel in conformance with the Commission's Advisory Committee Charter, to assist in carrying out the Board's responsibilities. Advisory Panels shall also work with Plan Development Teams and Plan Review Teams, as requested.

(h) **Law Enforcement Committee**. The Law Enforcement Committee is a standing ASMFC committee established by the Commission. The Law Enforcement Committee carries out assignments at the specific request of the Commission, the ISFMP Policy Board, the Management Boards, the Plan Development Teams, and the Plan Review Teams. In general, the Committee provides information on law enforcement issues, brings resolutions addressing enforcement concerns before the Commission, coordinates enforcement efforts among states, exchanges data, identifies potential enforcement problems, and monitors enforcement of measures incorporated into the various interstate fishery management plans. The Law Enforcement Committee is comprised of law enforcement representatives from each member state, the U. S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U. S. Coast Guard. The Law Enforcement Committee convenes a working meeting in the spring, meets in conjunction with the Commission's Annual Meeting, and convenes other meetings as needed. Among its ISFMP duties, the Law Enforcement Committee shall:

(1) provide advice to Plan Development Teams regarding the enforceability of measures contemplated for inclusion in fishery management plans, including enforcement information needed for the Source Document and Background Summary pursuant to Section Six(b)(2)(E); analysis of the enforceability of the proposed measures; and if the fishery management plan provides for conservation equivalency, enforcement procedures for alternative management measures;

(2) provide advice to each Plan Review Team at least annually or as provided in a given fishery management plan regarding the adequacy and effectiveness of states' enforcement of the measures implemented pursuant to the fishery management plan;

(3) coordinate, among law enforcement personnel, the preparation of reports concerning state law enforcement and compliance in order to ensure these analyses are comparable; and

(4) upon request or on its own initiative, provide enforcement advice and information regarding any fishery management plan to any Committee, Team, Board, or Advisory Panel in order to carry out activities under this Section.

(i) **Other ASMFC Committees**. Other ASMFC Committees, e.g. Habitat, Statistics Policy, etc. shall upon request or on their own initiative provide advice and information to any committee, including a Management Board, Plan Development Team, Plan Review Team, Technical, Law Enforcement, or Management and Science Committees, in order to carry out activities under this Section.

Section Six. Standards and Procedures for Interstate Fishery Management Plans

(a) **Standards**. These standards are adopted pursuant to Section 805 of the Atlantic Coastal Fisheries Cooperative Management Act (P.L. 103-206), and serve as the guiding principles for the conservation and management programs set forth in the Commission's fishery management plans. The Atlantic States Marine Fisheries Commission recognizes that an effective fishery management program must be carefully designed in order to fully reflect the varying values and other considerations that are important to the various interest groups involved in coastal fisheries. Social and economic impacts and benefits must be taken into account. Management measures should focus on conservation while allowing states to make allocation decisions. Fishery management programs must be practically enforceable, including as much as possible the support of those being regulated, in order to be effective. An FMP should allow internal flexibility within states to achieve its objectives while being fairly and equitably implemented and

administered by the states. Above all, a fishery management plan must include conservation and management measures which ensure the long term biological health and productivity of fishery resources under management. To this end, the Commission has adopted the following standards:

1. Conservation programs and management measures shall be designed to prevent overfishing and maintain over time, abundant, self-sustaining stocks of coastal fishery resources. In cases where stocks have become depleted as a result of overfishing and/or other causes, such programs shall be designed to rebuild, restore, and subsequently maintain such stocks so as to assure their sustained availability in fishable abundance on a long-term basis.

2. Conservation programs and management measures shall be based on the best scientific information available.

3. Conservation programs and management measures shall be designed to achieve equivalent management results throughout the range of a stock or subgroups of that stock.

4. Management measures shall be designed to minimize waste of fishery resources.

5. Conservation programs and management measures shall be designed to protect fish habitats.

6. Development and implementation of fishery management plans shall provide for public participation and comment.

(b) **Contents**. A fishery management plan should be a readily available, concise, and understandable document designed to inform the Commission and the public of the need for and nature of management action to provide for conservation of coastal fisheries, to allow the public to have effective participation in the management planning process, and to help Commissioners to make decisions on fishery management plans. Additionally, the FMP should facilitate implementation and enforcement of the fishery management program in the individual states. With this in mind, all fishery management plans of the Commission shall contain the following items:

(1) Management Program Elements:

(A) A statement of the problem being addressed by the fishery management plan, and the benefits to be achieved through implementation, including the social and economic benefits;

(B) The goals and objectives of the fishery management plan, including a specification of the management unit, a plan-specific definition of overfishing, and, if a stock is determined to be depleted as a result of overfishing and/or other causes, a specific rebuilding program and schedule for the resource;

(C) A statement of management strategies, options, and alternatives; and

(D) A complete statement of the management measures needed to conserve the fishery, including:

(i) a detailed statement on a State-by-State basis of each specific regulatory, monitoring, and research requirement that each State must implement in order to be in compliance with the plan; provided that the relative burden of the plan's conservation program and management measures may vary from state to state relative to the importance of the fishery in that state as compared to its importance in other states throughout its range; and provided that each fishery management plan shall address the extent to which States meeting de minimis criteria may be exempted from specific management requirements of the fishery management plan to the extent that action by the particular States to implement and enforce the plan is not necessary for attainment of the fishery management plan's objectives and the conservation of the fishery;

(ii) if the fishery management plan so provides, procedures under which the States may implement and enforce alternative management measures that achieve conservation equivalency;

(iii) a complete schedule by which States must take particular actions in order to be in compliance with the plan; and

(iv) a specification of the requirements for states' reports on compliance to be submitted to the Plan Review Team at least annually or as provided in a given fishery management plan, including the requirement for submission within a specified time line of copies of relevant laws and regulations for the record.

(v) a statement of those recommendations which States should implement in order to conserve fishery resources.

(vi) a statement of those recommendations which the Secretary of Commerce should implement in order to conserve fishery resources through complementary management measures in the Exclusive Economic Zone in the event that a federal fishery management plan has not been approved for this species.

(E) Adaptive Management: Each FMP may provide for changes within the management program to adapt to changing circumstances. FMPs which provide for adaptive management shall identify specifically the circumstances under which adaptive management changes may be made, the types of measures that may be changed, the schedule for state implementation of changes, and the procedural steps necessary to effect a change. Changes made under adaptive management shall be documented in writing through addenda to the FMP. FMPs must provide for public comment in making adaptive management changes. The Management Board shall in coordination with each relevant State, utilizing that State's established public review process, ensure that the public has an opportunity to review and comment upon proposed adaptive management changes.

(i) Adaptive management measures may include recommendations which the Secretary of Commerce should implement in order to conserve fishery resources through complementary management measures in the Exclusive Economic Zone in the event that a federal fishery management plan has not been approved for this species.

(2) Supporting Summary Information and Analyses

(A) a review of the resource and its biological status;

(B) a review and status of fish habitat important to the stocks, and ecosystem considerations, including protected species aspects of the fishery;

(C) a review of the fishery and its status, including commercial and recreational fisheries and non-consumptive considerations;

(D) a review of the social and economic characteristics of the fishery; and

(E) an analysis of the enforceability of the proposed measures.

(3) Impacts: A summary evaluation of the biological, environmental, social, and economic impacts of the requirements and recommendations included in the FMP.

(c) **Source Document.** In addition to the FMP, the Plan Development Team and the staff shall compile a Source Document that contains all of the scientific, management, and other analyses and references utilized in preparation of the FMP.

(d) **Procedures.** All fishery management plans and amendments of the Commission shall be prepared according to the following procedures:

(1) Need for an FMP - Identification of priority species by the Policy Board will initiate the process to create a fishery management plan (FMP). The Management Board will appoint a Plan Development Team to develop the FMP for a particular species according to the process described in Subsections (C)(3) through (7).

(2) Need for FMP Amendment - Each Plan Review Team (PRT) shall evaluate the adequacy of each respective FMP at least annually and will submit to the Management Board a written report of its findings. The report will address, at a minimum, the following topics: adequacy and achievement of the FMP goals and objectives (including targets and schedules); status of the stocks; status of the fisheries; status of state implementation and enforcement; status of the habitat; research activities; and other information relevant to the FMP. The PRT shall also solicit and consider the input of the relevant Advisory Panel, if any, appointed pursuant to the Commission's Advisory Committee Charter, in preparation of its report. The PRT may recommend to the Management Board that a PDT be reinstated or convened. Using this information, the Management Board will determine whether the FMP needs amendment, including issues to be addressed, such as updating data, including results of new research or a new stock assessment, needed changes in state rules and/or enforcement, and recommended options and strategies to address the concerns. All Draft FMP Amendments shall be subject to the public comment process described under Subsection (c)(8), and shall be approved by the process described in Subsections (c)(4) through (7).

(3) Public Information Document - The species Plan Development Team shall

prepare a Public Information Document containing a preliminary review of biological information, fishery issues, and potential management options for the subject FMP or amendment being prepared. The PDT shall also solicit and consider the advisement of the relevant Advisory Panel, if any, under the Commission's Advisory Committee Charter, in preparation of the Public Information Document. The PDT shall also prepare appropriate audio-visual material to accompany the Public Information Document for presentation to the public. The Public Information Document, after approval by the Management Board, shall be made available to each State with an interest in the fishery and where applicable, Regional Fishery Management Councils, for the purpose of soliciting public comment as described in Section Six (c)(8).

(4) Preparation of Source Document and Background Summaries- During review and consideration of the Public Information Document, the PDT will begin to collate and prepare the Source Document as provided in Section Six(b)(4). After consideration of the reviews of the Public Information Document, the PDT shall prepare background summaries as provided in Section Six(b)(2)[A through E].

(5) Preparation of Draft Fishery Management Plan - After consideration of comments and views developed in response to the Public Information Document, the PDT, at the direction of the Management Board, will prepare a Draft Fishery Management Plan. Upon approval by the Management Board, the Draft FMP shall be referred to all relevant States and, where applicable, Regional Fishery Management Councils, for the purpose of conducting public hearings and soliciting other public comment as described in Section Six (c)(8).

(6) Preparation of the final Fishery Management Plan - After consideration of the record developed in receiving comment on the Draft FMP, the PDT shall, at the direction of the Management Board, prepare the final FMP.

(7) Review and Approval - The Management Board shall approve the FMP or refer it back to the PDT for revision. Once approved, the Management Board shall recommend that the ISFMP Policy Board refer the FMP to the Commission for adoption. The ISFMP Policy Board shall review the recommendation of the Management Board and either recommend to the Commission that the FMP be adopted, or refer it back to the Management Board for revision. Final approval of all FMPs shall be the decision of the Commission.

(8) Public Participation:

(i) The Management Board shall in coordination with each relevant State, utilizing that States' established public review process, ensure that the public has an opportunity to review and comment upon the problems and alternative solutions addressed by the Public Information Document (see Section Six [c][3]).

(ii) Upon completion of a draft FMP and its approval by the Management Board, the ASMFC shall again utilize the relevant States' established public review process to elicit public comment on the draft. The ASMFC shall ensure that a minimum of four public hearings are held, including at least one in each state that specifically requests a hearing. A hearing schedule will be published within 60 days following approval of the draft fmp; hearings may be held in conjunction with state agencies. The hearing document will be made available to the public for review and comment at least 30 days prior to the date of the first public hearing; availability will be announced by a press release issued by the commission. Written comments will be accepted for 14 days following the date of the last public hearing. The ASMFC will make the draft FMP and accompanying Public Information Document widely available to the public, including fishermen, consumers, government agencies and officials, environmental groups, and other interested parties throughout the geographic range of the draft FMP. Records of the public hearings and summaries of the written comments will be made available at cost to anyone requesting them. Summaries of verbal and written comments will be prepared by ASMFC staff and provided to Commissioners, the ISFMP Policy Board, the Management Board, the Advisory Panel, NMFS, and USFWS. Copies of the summaries will be made available to other parties at cost.

(iii) Agendas for meetings of the Management Board, the ISFMP Policy Board, and the Commission will include an opportunity for public comment prior to the Boards or Commission taking action on a fishery management issue.

(iv) Public comments will be evaluated and considered prior to deciding what modifications will be made to the draft FMP, or draft final FMP, and prior to approval of the FMP.

(9) Administrative Record - The PDT shall be responsible, in conjunction with the Commission staff, for collating and maintaining the administrative record for all FMPs.

(10) Emergencies - A Management Board may, without regard to the other provisions of Section Six (c), authorize or require any emergency action that is not covered by or is an exception or change to any provision in a fishery management plan. Such action shall, during the time it is in effect, be treated as an amendment to the FMP, and shall contain compliance dates for implementation of the emergency by the states.

(i) Such action must be approved by two-thirds of all voting members (i.e., entire membership) of the Management Board prior to taking effect.

(ii) Within 30 days of taking emergency action, the States and the Commission shall hold at least four public hearings concerning the action, including at least one in each state that requests it.

(iii) Any such action, with the exception of public health emergencies, shall originally be effective for a period not to exceed 90 days from the date of the Management Board declaration of an emergency, but may be renewed by the Management Board for a period up to an additional 180 days provided the Board has initiated action to prepare an FMP, or initiated action to amend the FMP in accordance with Section Six(c). Emergency actions taken to address a public health emergency shall remain in effect until the public health concern ceases to exist (this determination to be made by the Management Board). The Management Board may terminate an emergency action at any time with approval of two-thirds of all voting members (i.e., entire membership).

(iv) Definition of Emergencies. The provisions of this subsection shall only apply in those circumstances under which public health or the conservation of coastal fishery resources or attainment of fishery management objectives has been placed substantially at risk by unanticipated changes in the ecosystem, the stock or the fishery.

(11) Joint FMPs with Regional Fishery Management Councils - The Commission

recognizes that fish species and fisheries are transboundary across state and federal jurisdictions, and that proper and efficient fisheries conservation can only be achieved by close coordination between state and federal management systems. The Commission is committed to close cooperation with the Regional Fishery Management Councils in providing for coordinated and compatible fisheries management. To this end, each Management Board shall work closely with appropriate Council organizations to develop coordinated approaches to management.

(i) A Management Board may decide with a Regional Fishery Management Council to prepare a FMP jointly with that Council, with the intent that the Council and the Commission will approve the same FMP document. In such instances the Management Board and the Council will establish the specific procedures and schedules to follow during FMP development, including assignments of staff responsibilities on Plan Development Teams, Technical Committees and other fishery management program staffing and support groups, including Advisory Panels.

(ii) A Management Board shall endeavor whether or not a joint FMP is being prepared, to coordinate its meetings, meetings of the relevant Advisory Panel, and public hearings with relevant Council meetings and hearings.

Section Seven. Compliance

(a) All states are responsible for the full and effective implementation and enforcement of fishery management plans within areas subject to their jurisdiction. Each state shall submit a written report on compliance with required measures of a specific fishery management plan in conformance with reporting requirements and schedules specified in the plan, which requirements shall include submission of copies of relevant laws and regulations for the Commission's record. At any time, according to the procedures contained in this Section, the Commission may determine that a State is not fully and effectively implementing and enforcing the required provisions of a fishery management plan, and is therefore not in compliance with that plan. All evaluations, findings, and recommendations regarding compliance determinations shall be in writing.

(b) **Schedule for Reviews** - Implementation and compliance for FMPs will be reviewed

according to the Action Plan approved by the ISFMP Policy Board. The schedule shall provide for review of each FMP at least annually, or more frequently as provided in a given fishery management plan. In addition to the scheduled reviews, the Plan Review Team may conduct a review of the implementation and compliance of the FMP at any time at the request of the Management Board, Policy Board, or the Commission.

(c) **Role of the Management Board** - Each Management Board shall, within 60 days of receipt of a State's compliance report, review the written findings of the Plan Review Team developed according to the previous subsection. Based upon that written review, as well as other information that it has or may receive, the Management Board may recommend to the Policy Board that a State be found out of compliance, including the rationale for the recommended finding of non-compliance. The recommendation shall specifically address the required measures of the fishery management plan that the State has not implemented or enforced, a statement of how that failure to implement or enforce the required measures jeopardizes the conservation of the resource, and the actions a State must take in order to comply with requirements of the FMP.

(d) **Role of the Policy Board** - The Policy Board shall, within 30 days of receiving a recommendation of non-compliance from a Management Board, review that recommendation of non-compliance. If it concurs in the decision, it shall recommend at that time to the Commission that a State be found out of compliance.

(e) **Review and Determination by the Commission** - The Commission shall consider any recommendation forwarded under Subsection(d), as quickly as possible and within 30 days of receiving a recommendation of non-compliance from the Policy Board. Any State which is the subject of a recommendation for a finding of non-compliance shall be given an opportunity to present written and/or oral testimony concerning whether it should be found out of compliance. The State may request that the Commission's consideration be held at a formal meeting by roll call vote. With the consent of the Commissioners from the State subject to the recommendation, the Commission's decision may be made by mail/FAX ballot. If the Commission agrees with the recommendation of the Policy Board, it may determine that a State is not in compliance with the relevant fishery management plan, and specify the actions the State must take to come into compliance. Upon a non-compliance determination, the Executive Director shall within ten working days notify the State, the Secretary of Commerce, and the Secretary of the Interior of the Commission's determination.

(f) **Withdrawal of Determination** - Any State subject to a moratorium at has revised its conservation program in response to a determination of non-compliance may request that the Commission rescind its findings of non-compliance.

(1) If the State provides written documentation to the Commission of implementation of every measure required of it, the withdrawal will be automatic upon issuance of a letter from the Commission Chairman to the State, Secretary of Commerce, and the Secretary of the Interior.

(2) If the measures implemented deviate from those required of the State, the State shall provide a written statement on its actions which justify a determination of compliance. The Management Board shall promptly conduct such re-evaluation and make a recommendation to the Policy Board that the recommendation or determination of non-compliance be withdrawn. Upon the recommendation of the Policy Board, the Commission may withdraw its determination of non-compliance, whereupon the Executive Director shall promptly notify the State, the Secretary of Commerce, and the Secretary of the Interior. The re-evaluation by the Management Board, review by the Policy Board, and action by the Commission shall be made within 45 days of the receipt by the Commission of the request for reconsideration by the State and may be made by mail/FAX ballot with the consent of the Commissioners from the subject State.

(g) **Appeal of Compliance Findings** - A State which disagrees with a Management Board's failure to find a State out of compliance may appeal that finding to the ISFMP Policy Board pursuant to Section Three(c)(10).

Section Eight. Definitions

(a) **Act** - The Atlantic Coastal Fisheries Cooperative Management Act, Title 8 of P.L. 103-206, signed by President Clinton on December 29, 1993.

(b) **Action plan** - A document prepared annually by ASMFC staff and approved by the Policy Board to provide priorities and schedules for the specific activities of the ISFMP during a given year.

(c) **Adaptive management** - An iterative process which includes evaluation of the response of the managed fishery and stock to specific management measures and adjusting such measures based on that evaluation.

(d) **Advisory Panel (AP)** - A group of interested and knowledgeable persons convened under the ASMFC's Advisory Committee Charter to assist in development of an FMP or amendment.

(e) **Best scientific information available** - Includes but is not limited to that body of biological, environmental, ecological, economic, and social data concerning the fish stock and fisheries which are the subject of an FMP or amendment, provided that the methods of collecting such information are clearly described and are generally accepted as scientifically valid. Data may come from state, federal, or private databases and from published and unpublished sources. Information which becomes available during preparation of an FMP or amendment should be incorporated to the extent practicable.

(f) **Bycatch** - That portion of a catch taken in addition to the targeted species because of non-selectivity of gear to either species or size differences; may include non-directed, threatened, or endangered and protected species.

(g) **Compliance** - Condition in which a state has implemented and is enforcing all measures required by an FMP. States are presumed to be in compliance unless determined to be out of compliance pursuant to Section Seven.

(h) **Conservation** (from the Act, Section 803[4]) - The restoring, rebuilding, and maintaining of any coastal fishery resource and the marine environment, in order to assure the availability of coastal fishery resources on a long-term basis.

(i) **Conservation equivalency** - Actions taken by a state which differ from the specific requirements of the FMP, but which achieve the same quantified level of conservation for the resource under management. For example, various combinations of size limits, gear restrictions, and season length can be demonstrated to achieve the same targeted level of fishing mortality. Conservation equivalency will be determined by the appropriate Management Board.

(j) **Conservation program** - Enactment of rules or statutes, research, biological monitoring, collection of statistics, stock enhancement, and enforcement activities conducted by a state to maintain, restore, and/or rebuild a fish stock and its habitat.

(k) **De minimis** - A situation in which, under existing conditions of the stock and scope of the fishery, conservation and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coastwide conservation program required by an FMP or amendment.

(l) **Directed fishery** - Fishing for a stock using gear or strategies intended to catch a given target species, group of species, or size class.

(m) **Emergency** - unanticipated changes in the ecosystem, the stock, or the fishery which place public health, the conservation of coastal fishery resources, or attainment of fishery management objectives substantially at risk.

(n) **Fish** (from the Act, Section 803[7]) - "finfish, mollusks, crustaceans, and all other forms of marine animal life other than marine mammals and birds."

(o) **Fishable abundance** - Numbers of fish in a stock sufficient to provide continuing harvests in the range of historic average levels without overfishing the stock.

(p) **Fishery** (from the Act, Section 803[8])

(A) "one or more stocks of fish that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographical, scientific, technical, commercial, recreational, or economic characteristics; or

(B) any fishing for such stocks."

(q) **Fish habitat** - The environment upon which a fish stock is dependent as it conducts its normal life history functions of spawning, feeding, and migration; including biological, physical, and chemical factors which influence the choices of such areas.

(r) **Fishery management** - All activities conducted by a government to improve, restore, rebuild, or maintain fish stocks and fisheries, including statutory action and rule-making, enforcement, research, monitoring, collection of statistics, enhancement, protection, development, and habitat conservation.

(s) **Implementation of an FMP** - Conducting a state conservation program which meets all requirements for that state as provided in an FMP or amendment.

(t) **Law Enforcement Committee** - The principal body, established by the Commission, which advises the ASMFC on issues of law enforcement and enforceability of potential management measures, comprised of representatives of each member state, Washington, D.C., National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the U.S. Coast Guard.

(u) **Management measure** - A statute or rule enacted by a state to conserve a fishery and/or protect its habitat.

(v) **Management and Science Committee (MSC)** - The principal scientific advisory body of the ASMFC, comprised of representatives from member states, National Marine Fisheries Service, and U. S. Fish and Wildlife Service.

(w) **Minimize waste** - Process of taking specific actions which reduce the effects of fishing activities on non-target resources (habitat and bycatch) and promote full, efficient utilization of the catch.

(x) **Non-compliance** - A condition under which the ASMFC has determined that a State has failed to implement and enforce a conservation program as required in an FMP or amendment.

(y) **Non-indigenous species** - A species of fish which is not native to a particular geographic area.

(z) **Overfishing** - In the context of the ISFMP, harvesting from a stock at a rate greater than the stock's reproductive capacity to replace the fish removed through harvest. Each FMP contains a plan-specific definition of overfishing.

(aa) **Plan Development Team (PDT)** - A group of individuals who are knowledgeable concerning the scientific facts and fishery management issues concerning a designated fish stock and who are appointed and convened by a Management Board to prepare an FMP or amendment and its supporting Source Document.

(bb) **Plan review** - An evaluation of an FMP, considering adequacy and relevance of the goals and objectives, stock status, fishery status, implementation status, research activities, and recommendations.

(cc) **Plan Review Team (PRT)** - A group of individuals who are knowledgeable concerning the scientific facts, stock and fishery condition, and fishery management issues concerning a designated fish stock and who are appointed and convened by a Management Board for the purpose of conducting an annual plan review for an FMP.

(dd) **Protected Species** - species which are regulated under the jurisdiction of state endangered species regulations, federal Endangered Species Act or Marine Mammal Protection Act.

(ee) **Public Information Document (PID)** - A document of the ASMFC which contains

preliminary discussions of biological, environmental, social, and economic information, fishery issues, and potential management options for a proposed FMP or amendment.

(ff) **Range** (functional) - The geographic area utilized by a fish stock and its dependent fishery as defined in an FMP.

(gg) **Recommendations** - Actions identified in an FMP which should be taken by the states, but are not required, such as enactment of rules, research, monitoring, collection of statistics, and enhancement, which collectively will promote restoration, rebuilding, or maintenance of a stock.

(hh) **Regulatory** - Of or pertaining to any administrative or legislative measure in a sense that requires compliance by individuals involved in the fishery.

(ii) **Requirements** - Actions set forth in an FMP which must be taken by the states specified in such FMP, such as enactment of rules, research, monitoring, collection of statistics, and enhancement, which collectively will promote attainment of the FMP's objectives for restoration, rebuilding, or maintenance of a stock, and are the measures against which compliance is judged. Failure of a specified state to implement a required action may result in a finding of non-compliance under the Act.

(jj) **Source document** - The comprehensive support document to an FMP which is compiled by the Plan Development Team and ASMFC staff and contains all the scientific, management, and other analyses and references utilized in preparation of the FMP; the Source Document is kept on file with the ASMFC.

(kk) **State** - (from the Act, Section 803[13]) For purposes of the Act, one of the following East Coast jurisdictional entities: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, the District of Columbia, or the Potomac River Fisheries Commission.

(ll) **Stock Assessment Committee (SAC)** - A group consisting of experts in fish population dynamics and appointed and convened by a Technical Committee, at the request of a Management Board, to prepare a stock assessment for a specified fish stock using the best scientific data available and established techniques.

(mm) **Stock** - A group of fish of the same species which behave (spawn, migrate, feed) as a unit.

(nn) **Subgroup** - A group of fish from the same stock which consistently conducts itself as an identifiable unit.

(oo) **Target species** - A species or group of species of fish which certain fishing gear or strategies are designed to catch.

(pp) **Technical Committee (TC)** - A group of persons who are expert in the scientific and technical matters relating to a specific fish stock and who are appointed and convened by a Management Board to provide scientific and technical advice in the process of developing and monitoring FMPs and amendments.

(qq) **Trigger** - A measure of a specific attribute of a fish stock or fishery for which values above or below an established level initiates a pre-specified management action.