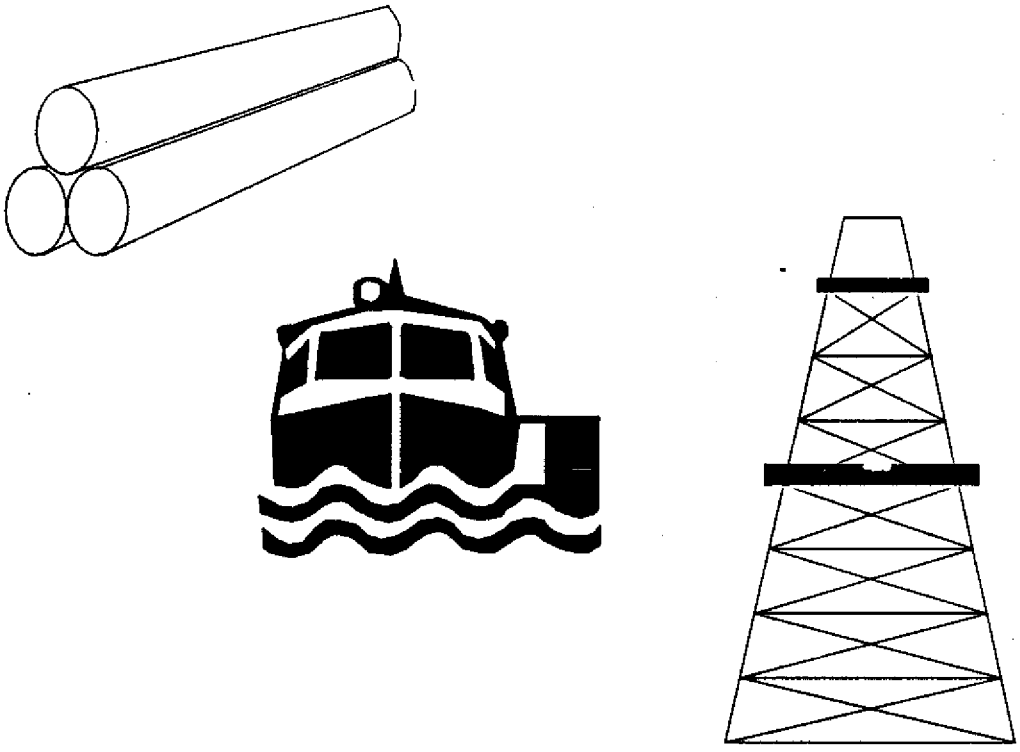
SGR-93

Florida Artificial Reef Summit

Proceedings of a Conference Held November 2, 1987 in Miami, Florida



Edited by Scott Andree

Florida Sea Grant Extension Program

SEA GRANT

Florida Artificial Reef Summit

Proceedings of a Conference Held November 2, 1987

in Miami, Florida

Sponsored by
Florida Sea Grant College Program
Florida Sea Grant Extension Program

Edited by
Scott Andree

Sea Grant Project IR 87-7

Grant No. NA86AA-D-S6068

Sea Grant Report 93

Florida Sea Grant College Program

August 1988

Price: $2.00

Acknowledgments

The editor gratefully acknowledges those persons, organizations, and agencies that supported this Summit Meeting with their prayers, presence, assistance, and, of course, funds. In particular, the Florida Sea Grant College Program, which supported the summit by an immediate response grant (IR 87-7, Grant No. NA86AA-D-S6068, UF Project No. 7305-021-13) and the Florida Keys Artificial Reef Association, the Fort Pierce Sportsfishing Club, the Organization for Artificial Reefs (Tallahassee), and the Jacksonville Offshore Fishing Club, which cosponsored the reception.

Particular individuals greatly assisted the development and organization of the program, especially those serving on the steering committee. Many thanks to Ed Kalakauskis, Ben Mostkoff, Don Pybas, Ron Schmied, Bill Seaman, and Virginia Vail.

Also, the assistance and support of the Florida Sea Grant office, Bill Seaman, Twila Stivender, Tom Leahy, and Lin Welch, keeping everything on track from planning to final publication, was greatly appreciated. Finally, a special thanks to Rita Shivers for her expeditious and thorough clerical assistance and Ginny Vail for assisting the editing of the proceedings.

Scott Andree
Editor
June 1988

Table of Contents

Summit Synopsis

The following issue statements represent the accordant opinion of the Summit participants (attendance of 95 persons) on the key issues discussed at the Florida Artificial Reef Summit, November 2, 1987.

1) Florida needs a statewide artificial reef plan that addresses all Florida aquatic habitats and local user needs, establishes guidelines for orderly reef building, sets criteria (minimum standards) for reef siting, design, and construction, and establishes a funding base to support artificial reef planning, management, and construction.

2) Florida should have an expanded state artificial reef program that would assist county level reef-building programs in implementing the statewide plan through administration of funds, resources, and guidance.

3) Florida needs a centralized permitting system which utilizes uniform criteria for review of all permits (state and federal), trains staff on artificial reef minimum standards, and establishes stiffer enforcement procedures.

4) Florida should require state and local reef-building programs to set management goals prior to reef construction and to establish monitoring and maintenance procedures and criteria.

5) Florida needs a statewide association, or network, of artificial reef interests to establish better communication between government agencies and local programs and among local programs statewide, which will enhance information and technology transfer and encourage the most responsible efforts in the field.

Introduction

Scott Andree
Summit Chairman and Sea Grant Extension Agent, Florida Sea Grant Extension Program, Tallahassee, Florida

WHY SHOULD Florida have a summit on artificial reefs? The idea was initiated by Bill Seaman, Associate Director of Florida Sea Grant, chairman of the Fourth International Conference on Artificial Habitats for Fisheries. With the international meeting being held in Florida, the timing was right for planning a statewide meeting. The last time Florida's reef building and research community had met to share ideas and concerns was in Daytona Beach in 1979, a conference also coordinated and co-sponsored by Florida Sea Grant (Florida Sea Grant Report 41, February 1981).

Since 1979, there has been a rapid proliferation of artificial reef sites in Florida. Currently, there are over 210 permitted reefs off Florida's coast, making Florida the national leader in reef development in terms of numbers of reefs. But this expansion has also drawn attention to resource management and environmental concerns by governmental authorities, competing resource users, researchers, and others.

It was apparent that evaluation of our reef building programs, methods, and impacts in Florida was needed. The meeting program was designed as a first step in this evaluation process, with the ultimate goal being to determine how artificial reef building could be improved to maximize benefits to all Florida citizens, as well as the natural environment.

The objectives of the Summit Meeting were to 1) review recent changes in agency policies or programs that will affect future artificial reef construction in Florida, 2) present and discuss different perspectives of reef resource users as to current reef building practices, and 3) debate current policy issues to generate recommendations for decision makers to improve future reef development.

Since the make-up of Florida's reef building community is as varied as the types of materials used to build reefs, it was important that all segments be represented at the summit. The program was organized to involve as many points of view and perspectives as possible in one day, and obviously time constraints meant some were left out. It was hoped that, via panel discussions and the issue debates, all views and perspectives could be expressed.

The characteristic that typifies Florida's reef builders and managers is their commitment to doing a better job with each successive reef project. It is now time to combine these individual efforts and programs into a statewide effort, whether that be establishing a state plan or program, or simply networking the groups into a statewide association. It is my hope that this meeting and proceedings will be a catalyst to assist this evaluation process and lead to an improved artificial reef program for the State of Florida to benefit all its citizens and its marine resources.

Keynote Address: The Future of Artificial Reefs in Florida

Representative Peter M. Dunbar
Florida House of Representatives, District 50, Republican, Crystal Beach, Florida

I WILL mention a number of things that go beyond just the issue of the artificial reefs, because I think it will help you understand what we face as policymakers. Jim Cato, in his introductory remarks, mentioned some of the environmental pieces of legislation that we have passed in the last decade. Florida can be quite proud of them. They are landmark pieces of legislation in almost every area. This legislation includes the Wetlands Bill, the Surface Water Improvement and Management (SWIM) Act, and two programs to purchase endangered lands: Save Our Rivers and Save Our Coasts. We also have major new programs and mandates for solid waste recovery and for growth management.

Unfortunately, in our efforts to deal with Florida's environment, while at the same time trying to deal with Florida's growth and the pressure it brings on our natural resources, we are noticeably ignoring the resources below the mean high water line. The extent to which we provide conservation measures offshore is more a result of our efforts to protect the uplands than our efforts to protect the marine environment, for example, in growth management and wetlands preservation.

In Tallahassee we lack a widespread awareness and commitment to marine conservation, and often the things we have done may have happened for reasons that were not even the right reasons. For example, the bill establishing the Marine Fisheries Commission, co-sponsored by James Harold Thompson and myself, was a product of almost a year's worth of work. The legislation was motivated partly by need, but primarily by the desire to remove policymaking for our fisheries from the legislature itself. Its purpose was to eliminate the local bills and the constant hassling between commercial and recreational fishing interests from the legislative hallways, rather than being motivated by good environmental concerns and good management policies. I think we lack a comprehensive focus, by researchers and by environmentalists, who care about the field. We have a tendency to look in the areas that are of the most immediate concern to us, while losing sight of the many elements making up the resource and the associated management policies.

We also lack coordination. One of the nice things about today's program, which is particularly pleasing, is that persons like the commissioner from Citrus County are here with others like him – local level managers and policymakers – to develop coordinated efforts in habitat enhancement. We have a terrible lack of coordination in our efforts. We are very fragmented and that's one of the things I think we can improve on.

1988 Legislative Outlook

The message I would like to give you today is: What you can look forward to from the legislature. By saying that, I would also extend an invitation to you to help us achieve a better program in marine management based on some of the following key issues.

In 1988, there are some changes we hope will take place and there are some I think will happen. First, our governor has identified the marine environment as one of his concerns. We hope that this can be cultivated to provide significant leadership in marine resource issues from the chief executive. There is also growing support in the legislature. I can remember a time when there might have been only

two or three of us concerned with the marine environment; now there is well over a majority, I think, in both houses. While there are still notable exceptions, we have substantial, growing legislative support for better marine resource programs from such leaders as House Speaker Jon Mills, the Senate President John Vogt, the chairmen of several major committees, and Republican leaders in both Houses. One other thing that has happened in the last six or seven months is that the Chairman of the House Natural Resources Committee has appointed a special select subcommittee on coastal resources. We hope the subcommittee will make a comprehensive report for consideration by the legislature right after the first of the year.

The Saltwater Fishing License

Let me talk for a minute about some specific legislative initiatives you can expect to see this year, and my prediction for their success or failure. Let me begin with the saltwater recreational fishing license. It is something that I have sponsored annually for seven years – trying to move the idea in one form or another. The first year I introduced the bill, we worked on it without a whole lot of success. Now things have changed rather significantly. In the 1987 legislative session the bill actually cleared all three of its committee assignments and passed the full House of Representatives by about a two-thirds margin.

We did not have quite the same success in the State Senate, although I think there was a majority in the State Senate prepared to endorse and pass the legislation. This year we have two rather significant hurdles to leap. The legislation must have the support of both the Finance and Tax Committee and the Rules Committee, and that support does not currently exist. To gain that support will require a lot of work.

Let me briefly describe why the saltwater fishing license bill is so significant. It is important because it is the major missing element of a comprehensive marine resource management policy, the funding source. There are still some things we need to do, but not much can happen if the funding is not available. If you follow the legislature at all, you know that we have been debating, for better than a year, the sales tax on services and other major revenue sources to try to deal with Florida's growth. Even if we are successful in keeping this tax, or finding an alternative source of revenue, there still are not enough funds to meet general needs, which range from prisons to education to whatever else. Establishing a designated source of funds for marine resource management is, to me, the only possible answer.

I find that the recreational community, by large measure, greets the recreational saltwater fishing license with support. The reason they do so is because it is clearly earmarked and trust-funded for specific purposes: 1) increased enforcement, 2) additional research, 3) habitat rehabilitation, and 4) artificial reef construction. Depending on what type of exemptions are added to the bill when the legislation finally passes, I hope it will raise between $20 and 30 million. That is, I believe, 20 and 30 times the amount of money the state currently devotes to one of its best resources. I hope that you will give it some thought. I know many of you have been supporters of this legislation. It is something that we desperately need.

Coastal Resources Subcommittee

There are some other things we're going to look at this year. The Coastal Resources Subcommittee efforts have been fueled by Secretary (U.S. Dept. of Interior) Hodell's efforts to begin leasing offshore mineral rights, particularly petroleum. We are most concerned about these drilling leases to be given to the major oil companies. There are some of us who would like to see these leases stopped outright. I am among them. We had hearings in Key West on the subject a week ago Friday

(October 1987). We hope to use the Coastal Resources Subcommittee as the vehicle to create a more comprehensive management policy, tying together a lot of loose pieces that relate to coastal policy, from resource development to management, and from research to the actual implementation of resource management in the field.

One of the things that has troubled me a little bit, which I hope that legislation may begin to resolve, is that we have many different players working or dealing in the coastal or marine areas: the Department of Natural Resources, with some fine personnel and some fine facilities; the Marine Fisheries Commission, a budding yet much maligned agency, which has had to tackle some very difficult problems at the very beginning of their agenda; and Florida Sea Grant and other basic academic sources that can bring extensive research to bear on the above problems. All of these I hope we can tie together with some additional financial resources.

Apart from the fishing license itself, we have identified another source of potential revenue we hope to use this year to begin the preliminary work for a coastal law and policy center, or centers, here in Florida. For example, for the Marine Fisheries Commission, we would like to pick up some management areas where we are lacking in jurisdiction, or where federal programs are not managing Florida species. I was talking earlier with Russ [Nelson, Executive Director of the commission] and was surprised to learn that while we, in Florida, have treated snook as a troubled species from a recreational and environmental point of view for a long time, in Federal waters it is not protected. Apparently there are a number of other species for which there is no federal management policy in place. I hope this spring that the legislature will clearly mandate that, for each of those species, it is the responsibility of the Marine Fisheries Commission to extend the implementation of the state plans into federal waters.

A State Artificial Reef Program

The final thing that we would like to do is formally establish a program for artificial reefs to be housed in the Department of Natural Resources. Representative Patchett (R, Vero Beach) and I introduced such a bill last year and have prefiled one again this year: House Bill 16. Ideally, what will help bring it to bear is the dialog that comes from the group here and the expertise that is shared here. I hope that it will deal with everything from construction and permitting to the proper types of materials. I hope that it will maximize the use of revenue and, probably most important, encourage coordination of the good ideas and the commitments from both professional managers and volunteers. Finally, it will hopefully give to people, who would like to see the program recognized at its full potential, some formal state policy support for the work done by Sea Grant and others, such as the program that you are a part of today.

I really had come to speak a little longer, but I think, in the five to seven minutes left I'd really like to hear from you, your questions and your comments. Those of us who have been in Florida for a while, those of us who enjoy the marine environment, have not done enough to protect it. We have lacked in coordination. We have lacked in expressing our points of view. All this needs to get to the policymakers on the county commissions, in the Florida Legislature, and in U.S. Congress.

We have allowed and continue to allow practices in our marine environment where there is no proof that they are not damaging to the resource, and I suspect in many cases they are very damaging. I would like to see us reverse that trend. I would like to see the presumption be that you don't do it in the marine environment unless it is proved to be acceptable, safe, and environmentally sound. This would include activities ranging from the placement of artificial reefs and materials to the use of commercial fishing gear, which seems to be developed for greater ex-

pertise and efficiency faster than the regulatory bodies we put in place can even begin to deal with it.

To me, it is also short-sighted that parts of Florida should say that there is no need for substantial amounts of revenue to protect, preserve, and enhance this resource. We have waited far too long and in many places the damage that has been done is far greater than we would like to see. It troubles me very much that the areas that probably have the most to save are the ones that stand in the way of us putting in place the fishing license and revenue that we need to have to generate a comprehensive marine resource program. A program to serve some 11 million people here in Florida, plus the many visitors, plus that group of 30,000 or more people that come to make Florida their new home every month. In this effort, I hope that you will join me. I hope you will let the policymakers know your feelings. I hope that you will let them know that we need to open our eyes in Tallahassee because there are far too many with their heads in the sand. It is time to open our eyes.

Global and National Status of Artificial Reefs

William Seaman, Jr.
Associate Director, Florida Sea Grant College Program, and Associate Professor, Department of Fisheries and Aquaculture, University of Florida, Gainesville, Florida

IF WE THINK in terms of widespread public and private interest in artificial reefs, and also in terms of sheer numbers of persons and organizations involved in their development, Florida has to be on the leading edge of world efforts to enhance marine habitat and fisheries-related benefits using reefs. Many would say that's good news, in terms of visibility and prestige. But the challenge is to consider if this means that Florida also is on the leading edge of the technology to best accomplish its reef-related goals.

In fact, does Florida even have goals for its reef efforts? In other words, while the magnitude and diversity of the reef effort in Florida have been acknowledged widely, for example by the decision to hold an international reef conference at this same location all this week, there also is a soft underbelly to that effort—one which, in fact, motivated today's summit meeting.

To look beyond Florida reef efforts, however, this paper offers a perspective on reefs and other habitat technologies in other areas of the nation and world. The topics include motivation to build reefs, their extent, who builds them and how, the kinds of policies that pertain to them, the status of research and development in this field, and, finally, perceptible trends in reef development.

National and Worldwide Issues

A summary of the following seven factors as they relate to reef development globally and nationally is provided in Table 1.

Motivation

While the principal reason for starting reef programs in the U.S. has been to enhance recreational fishing benefits, in some areas commercial fishermen have parti-

Table 1. Highlights and principal emphasis of artificial reef efforts in the United States and other nations world-wide, according to basic program descriptors.

Factors related to reef development	Focus	
	U. S.	Global
Motivation	Recreation	Industrial, artisanal, national security
Extent	Widespread, independent	Concentrations: Japan, SE Asia, Mediterranean
Users/builders	Fishing, diving	Fishing
Construction	Surplus, opportunistic, state/local efforts	Targeted, opportunistic, national governments
Policy	NOAA National Plan, states variable	Variable
Research & development	Scattered	Variable
Trends	Coordination?, new materials and designs	Growing interest in development

cipated. For instance, there has been controversy in the Southeastern U.S. over the use of fish traps around artificial reefs. Recreational fishing has been a significant consideration, also, in Australia, New Zealand, and western Europe.

In other nations, however, commercial or subsistence fishing frequently has been a higher priority. Japan, of course, comes immediately to mind as a foremost example of specifically declaring self-sufficiency of national food supply as a reason for building reefs. Meanwhile, lesser developed nations have fostered artisanal fishing by means of low energy techniques, such as using palm fronds as fish-attracting devices in the Philippines.

Extent

Interests in Louisiana recently have boasted of 4,000 artificial reefs, by virtue of that state's extensive fields of offshore petroleum production platforms. In fact, from that area the so-called "rigs-to-reefs" effort has emerged. By now several nations have considered the feasibility of relocating such structures for fisheries habitat.

More traditional structures, actually constructed for the sole purpose of fish enhancement, have been deployed by a myriad of U.S. interests, ranging from state agency-operated programs such as Washington's to local government efforts such as the urban reef program in Washington, D.C., and private efforts in many states. Typically, individual states in the U.S. may have a dozen or so reefs.

Repeatedly, there is reference to the advanced, $750 million dollar reef program of Japan, but other areas of the world are initiating or expanding programs. Centers of activity include Thailand, Taiwan, the Philippines, Australia, Israel, Italy, France, and Monaco.

Users/Builders

As noted above, the interests that use reefs vary from recreational fishing and diving interests in the U.S. to food fisheries elsewhere. Sport divers in Miami, for example, contribute to the local economy. In contrast to Florida's far-flung grassroots, volunteer efforts, users may not always build the reefs. In many places, governmental agencies exclusively build reefs.

Recently, reefs as waste disposal sites have been evaluated, such as in the New York Bight using blocks of fossil fuel ash made from electric power plant wastes.

Construction

Reefs run the gamut from specially designed structures targeted to life history stages of a particular species all the way to opportunistically acquired surplus materials that meet basic criteria for size, density, transportability, and so forth.

Japan has massive multistory concrete and steel edifices, as manufactured by major corporations such as Asahi. At the opposite end of the spectrum are the derelict vessels lining the Atlantic coast of the U.S. and somewhere in between are experimental units—compromises between convenience and capital investment—such as a California structure of boulders intended to provide habitat mitigation.

Whereas the more industrialized nations expend more energy, material, and labor resources to deploy high density materials, nations concerned with artisanal fishing employ readily available materials such as brushpiles in Sri Lanka or palm fronds in the Philippines.

Policy

The National Reef Plan prepared by the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, represents a significant milestone for focusing and coordinating effort in this country. At the state level, policy and planning guidelines exist in a few places, such as South Carolina and Washington, while a laissez-faire approach typifies others. The closest thing to an

inventory of state and local plans is the datafile of the Artificial Reef Development Center, operated by the Sport Fishing Institute.

Besides the Japanese master plan for reefs, other countries with formal programs appear to be the Philippines, New Zealand, and Australia. Otherwise, like many American state efforts, international activity is fragmented.

Research and Development

The Japanese reef research and planning budget during just their first six-year reef plan, in 1976–82, was $62.5 million dollars. This amount is only a fraction of the total Japanese national investment in reef development and deployment. By comparison all else pales. In other nations, typically, research is being conducted by independent scientists on very limited budgets. It is significant that in the U.S. the Atlantic States Marine Fisheries Commission has established a reef committee that is addressing regional coordination of research to avoid duplication.

From research and development, of course, comes information transfer. One notable attempt to speed up that process was a worldwide bibliography prepared in Florida a few years ago.

Trends

Finally, where is reef-building going? The picture painted so far is one of varied colors and clarity. We have a field that involves 1) science and art, 2) high and low technology, and 3) planned versus nearly haphazard activity. Some of this variation is summarized in Table 1.

But for each point that we might criticize as imprecise or inefficient, we see efforts to correct or improve procedures. Science is trying to synthesize information that answers the ecological production/attraction question, for example. Builders are starting to look at real-world scale design questions, or else apply such information from Japan. And policy-makers are grappling with benefit-cost considerations that might have been dismissed or ignored in the past, including the ultimate question of how many reefs, if any, can be sustained in an area, and in turn what fishery stocks and harvests can be sustained.

In closing, Florida has much to learn from exchanges not only with other states but also with other nations. As the folks in the Extension Service would say, it's a matter of "working smarter, not harder."

Artificial Reefs in Florida

Donald Pybas and William Seaman, Jr.
Sea Grant Extension Agent, Florida Sea Grant Extension Program, Miami, Florida (presenter of paper) and Associate Director, Florida Sea Grant College Program, Gainesville, Florida

IN TERMS of numbers, Florida is recognized as a leader in the development of artificial reefs, for both active permits and documented sites (210) that have been constructed. In addition, several de facto artificial reefs created by accidental sinkings and a significant number of "midnight reefs" (i.e. nonpermitted artificial reefs) exist in Florida's marine waters. The primary user groups are recreational fishermen, with independent local interests typically serving to initiate and coordinate reef development.

According to U.S. Army Corps of Engineers records, 387 permits were issued, as of July 1987, for artificial reef development in the marine waters of Florida. The first reef permit was recorded in 1918. Many permits were reapplications by the original permit holder yet recorded separately; other permittees applied to enhance previously permitted artificial reef sites. Several times, more than one active permit was issued for an existing site, resulting in overlapping permits. Some permitted sites have never been developed or were built with unstable materials that have been scattered, deteriorated, or sunk into soft substrate after deployment.

Permitting and Location

Of the 387 permit applications only 210 actual permitted sites were documented or were believed to exist as of April 1987. Figure 1 illustrates the geographic distribution of artificial reefs in the marine waters of the state. The data in this paper were compiled through a Florida Sea Grant Extension Program statewide survey of local artificial reef programs and knowledgable individuals. They are reported in the publication *Atlas of Artificial Reefs in Florida* (SGEB-13, 1987). Figure 2 depicts the total number of artificial reefs sites in each coastal county in Florida and the number permitted and/or developed since the second edition of the reef atlas was published in 1983. Duval County has the highest number of sites in Florida with 25. Southeast Florida counties (Palm Beach, Broward, Dade, and Monroe) have had extensive increases in reef development in this period (1983–1987), as have a number of counties on the central east, southwest, and northwest coasts.

Florida Reef Builders

Artificial reef permit applications and construction in Florida have been initiated by a myriad of organizations. As of April 1987, permits for artificial reefs were issued to (or are currently held by): county governments, 54%; fishing and diving clubs, 21%; private individuals, 6%; city government, 5%; reef associations/organizations, 5%; businesses/corporations, 4%; others, 5.4% (Figure 3).

Unlike many states, Florida has a decentralized artificial reef development/management approach where parties desiring to build an artificial reef may acquire the necessary federal and state permits and deploy materials on the site if they are willing and able to obtain the materials and incur the cost of deployment. No official reef policy or statewide development plan exists, although financial assistance is available through state government, specifically the Florida Department of Natural Resources (FDNR). However, there is no state agency program responsible for marine artificial reef research or monitoring.

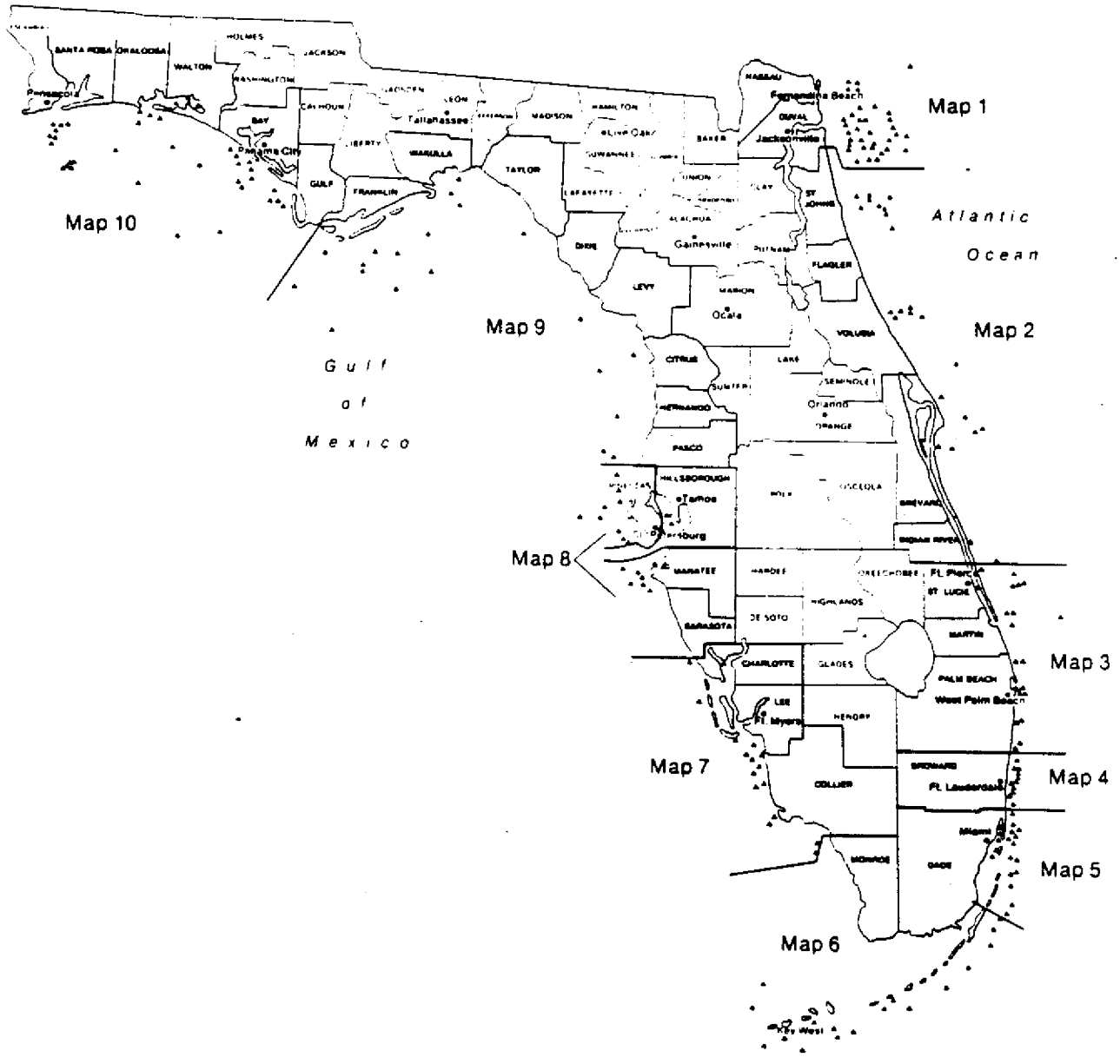


Figure 1. Florida permitted artificial reefs. Map areas 1 to 10 are available in *Atlas of Artificial Reefs in Florida* published by Florida Sea Grant.

In the early years (1950–1970) of artificial reef development in Florida, fishing clubs, service organizations, and individuals were the most common permit holders, with some also held by local governments. The Florida DNR artificial reef development fund was initiated by the legislature in 1980 to assist local governments in transporting and deploying material to reef sites, using grants of up to $20,000 per applicant. Other funding sources for artificial reef development administered by the FDNR include Wallop-Breaux federal grants, the Derelict Vessel Program, and the Boating Improvement Trust Fund.

Since 1980, local governments have increased their number of permit applications for reefs, as well as their assistance to organizations, such as fishing clubs, to obtain funds and materials for developing the organization's permitted sites. An exception to this trend has been the recent increase in business and private individual

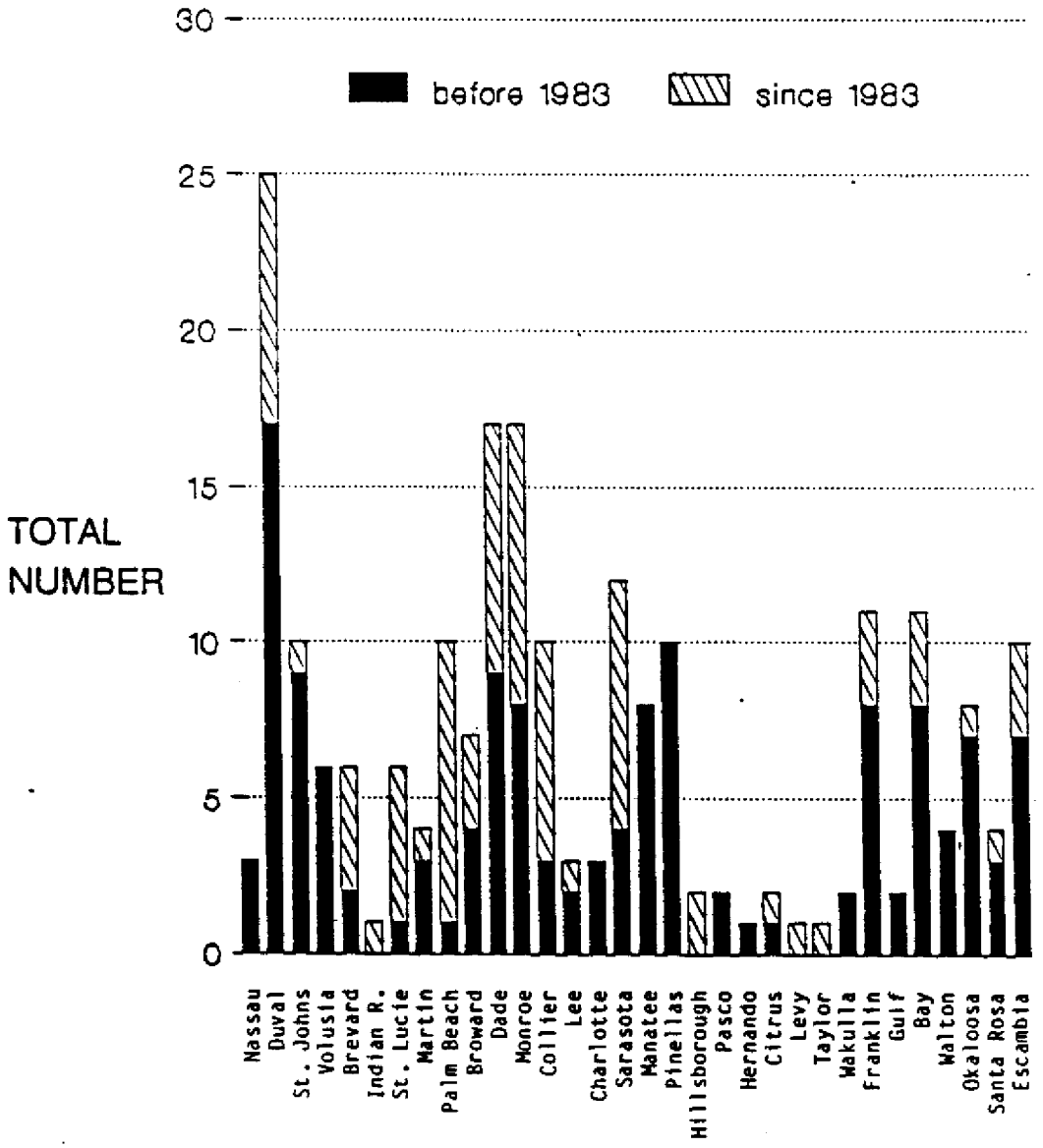


Figure 2. Number of artificial reef sites in Florida counties according to pre-1983 and 1984-1987 development (circumpeninsular listing of counties is from northeast [Atlantic] to west [Gulf]).

permit applicants in late 1986 and early 1987, primarily in the Florida Panhandle. This increase may have been caused by stricter surveillance by federal and state authorities for proof of valid permits from boaters leaving port with "reef materials."

Materials

Materials for artificial reef development have evolved over the years from early reefs made up of "white goods" (e.g. kitchen appliances), automobile bodies, and tires to public works salvage, (e.g. concrete bridge rubble and storm drain pipe), large vessels and designed materials. As Figure 4 illustrates, in excess of 40% of the material of artificial reefs in Florida include some type of vessel. Concrete rubble products and scrap steel were next in frequency used, at nearly 29 and 15%, respectively. The relatively new practice of deploying obsolete petroleum production plat-

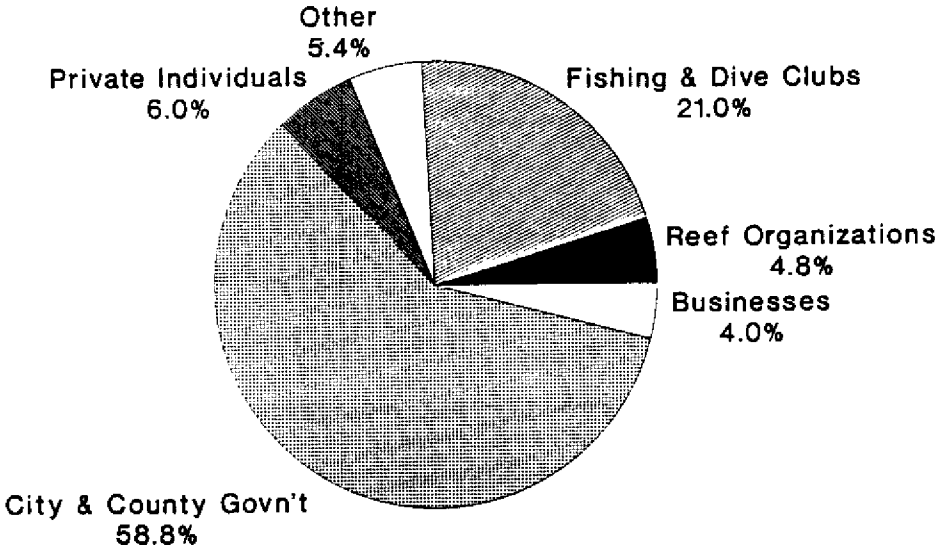


Figure 3. Applicants for reef development in Florida.

forms, while large in terms of volume of material, constitutes just under 1% of total number of reefs utilizing this material in Florida.

Table 1 depicts various material types, or items, used in Florida reefs. Under the "Vessels" category, steel vessels (211 occurrences) were by far the most frequent type of material used in Florida. Second most often cited were concrete rubble and products (154). Tires, from older reefs, were mentioned 58 times, and scrap metal occurs 49 times. All other items were mentioned 12 times or fewer.

Information Transfer

As interest in artificial reef development increased in recent years (1970–1980), a series of regional meetings have addressed the needs of reef interests. In addition, a variety of extension and research services have been conducted by Florida Sea Grant. There is growing grassroots interest in state reef planning and policy, in designing reef structures, and in relieving burdens on volunteer labor.

Note: Freshwater bodies of the state are managed by the Florida Game and Freshwater Fish Commission, which deploys various fish attractors in lakes for enhancement of fishery habitat. As these are in the freshwater environment, these attractors were not tabulated for this paper.

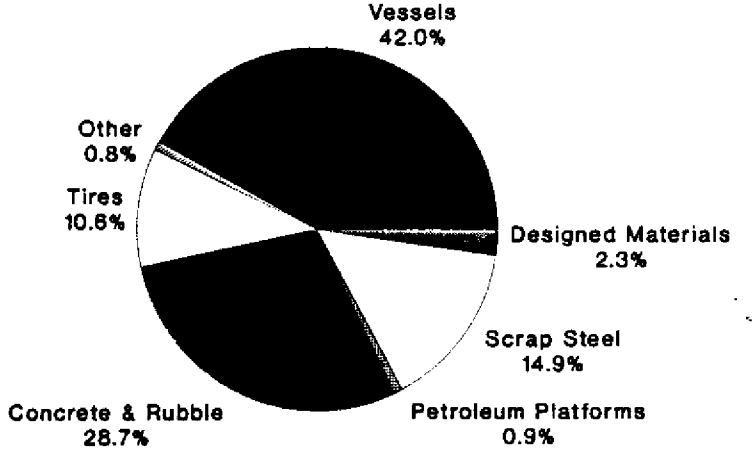


Figure 4. Materials used in Florida reef construction (percentages show frequency of listing, not necessarily individual units).

Table 1. Florida artificial reef composition according to type of material and individual items. Numbers show frequency of listing, not necessarily individual units.

Listed materials	Number of times used by local reef builders
Vessel	
Steel	211
Wood	8
Fiberglas	8
Concrete	3
Concrete/stone	
Concrete rubble, products	154
Limestone boulders	2
Clay pipe	1
Scrap metal	
Misc. scrap	49
Autos	12
Steel tanks	11
Airplanes	8
Cement mixer drums	2
Tires	58
Designed materials	
Japanese FRP units	2
Fish-aggregating devices	8
Oil ash blocks	1
PVC structures	1
Petroleum production platforms	5
Other	
Fiberglas boat molds	2
Bathroom fixtures	2

National Fishing Enhancement Act of 1984: New Federal Directions

Ronald L. Schmied
Special Assistant for Recreational Fisheries, National Marine Fisheries Service, St. Petersburg, Florida

GOOD MORNING. My assignment this morning is to summarize pertinent sections of the National Fishing Enhancement Act (NFEA) of 1984 and to describe the impact of that act on federal activities relating to artificial reef development. Since time is short, let's get on with the job.

The federal government has been involved in reef development in various capacities over the past 70 years, although our involvement has been limited primarily to permitting and research. In the early 1970s, our interest expanded due to creation of the National Marine Fisheries Service (NMFS) and passage of the Magnuson Fisheries Conservation and Management Act, which made the Secretary of Commerce directly responsible for the management, conservation, and orderly development of marine fishery resources. NMFS acts as the management agency on behalf of the Secretary.

Contributions to Fisheries

NMFS believes that artificial reefs can contribute to fisheries conservation and management goals in six important ways.

Maintaining, Restoring, and Enhancing Fishery Habitat

Artificial reefs can be used to expand critical habitat for habitat-limited fish such as snappers and groupers, as well as others dependent on coral reefs and bottom outcroppings. These artificial reefs therefore create shelter, spawning, nursery, and feeding areas for specific target species. A new emerging concept is to use artificial reefs to help mitigate habitat loss resulting from coastal development. However, this approach should be used only in appropriate in-kind mitigation situations.

Rebuilding Fish Stocks

Research has demonstrated that artificial reefs can increase carrying capacity and fish biomass in local areas. Moreover, the Japanese, who spend millions each year on artificial reef development, have demonstrated that reefs can be designed to enhance production of specific target species. Looking closer to home, reef fish stocks in the Gulf, which are currently considered to be overfished and stressed in many nearshore areas, may greatly benefit from artificial reef construction if combined with appropriate catch limitations (minimum size limits) or prohibitions (marine sanctuaries).

Increasing Food Production and Recreation Opportunities

By carefully analyzing the needs and fishing patterns of various user groups, artificial reefs can be built in a variety of locations and configurations to increase recreational and commercial fishing opportunities and catches. Construction of trolling alleys, fish aggregation systems, and benthic reefs can lead to increased catches, profits, and satisfaction for recreational and commercial users. As a commercial venture, use of artificial reefs in mariculture/aquaculture programs is an area that deserves additional attention.

Promoting Efficiency

Building artificial reefs offshore of fishing ports and urban areas can help reduce

costs of operation per trip for commercial and recreational fishermen. Increased operating cost is the single most important cause of business failure for commercial and recreational fishing businesses. Reduction of travel distance to fishing grounds can also provide an additional margin of safety for fishermen.

Reducing User Conflicts

Artificial reefs can be built to provide fishing opportunities for all user groups and to spatially separate users, thereby reducing conflicts. However, proper siting of artificial reefs is essential to avoid creating additional user conflicts. Designation of special management zones around reefs has already been required to reduce gear conflicts in some states.

Developing Underutilized Species

Estimates of underutilized marine fishery biomass in the South Atlantic, Gulf of Mexico, and Caribbean areas range from 5.2 to 10.3 billion pounds. Wherever the truth lies, it is clear that substantial opportunity exists for increased use of fishery resources for the benefit of recreational and commercial fishing industries and seafood consumers at large. Artificial reefs can be used to help fishermen selectively target species of interest, particularly pelagic species.

National Fishing Enhancement Act

Clearly, properly designed, sited, and constructed artificial reefs can help resolve numerous problems confronting state and federal fishery managers. Unfortunately, past efforts have suffered from a lack of planning. I'm sure that all of us have heard of, or have been involved in, reef development projects that just didn't pan out the way they were intended. Materials that were improperly placed or were not suitable for site conditions have drifted off-site and, in some cases, washed ashore, or even worse, came ashore in the cod end of some angry fishermen's net. In some cases, reef materials have disappeared due to corrosion or subsidence.

The National Fishing Enhancement Act (NFEA) was implemented in October 1984 to help avoid these expensive mistakes and to encourage and require more responsible and effective artificial reef development efforts in the future. The act accomplished several important functions:

1) It established five national standards for reef construction and management (see section 203, NFEA). Section 203 of the Act states:

> Based on the best scientific information available, artificial reefs in waters covered under this title shall be sited and constructed, and subsequently monitored and managed in a manner which will do the following:
>
> a) enhance fishery resources to the maximum extent practicable;
>
> b) facilitate access and utilization by United States recreational and commercial fishermen;
>
> c) minimize conflicts among competing uses of waters covered under this title and the resources in such waters;
>
> d) minimize environmental risks and risks to personal health and property; and
>
> e) be consistent with generally accepted principles of international law and shall not create any unreasonable obstruction to navigation.

2) It called for and precipitated development of a National Artificial Reef Plan (NARP) which was implemented in November 1985.

3) It clarified and beefed up federal permitting requirements for artificial reef construction by requiring the Secretary of the Army (Corps of Engineers) to

- consult and consider the views of appropriate federal, state, and local government agencies and other interests when issuing an artificial reef permit

- ensure that the proposed reef project is consistent with national standards and criteria
- ensure that title to reef construction material and responsibility for reef maintenance are clear
- ensure that the permit holder/applicant has the financial ability to assume any liability which may arise
- consider the NARP and advise the Secretary of Commerce of any need to deviate from the plan.

4) It clarified and limited the liability of reef permit holders and donors of reef construction materials.

5) It established civil penalties of up to $10,000 per violation of any provision of a reef permit.

Future Still a Question

With that brief coverage of the Act, the key question remains: What does all that mumbo jumbo really mean for the future of artificial reef development in the U.S.?

First and foremost, I believe that the NFEA has helped usher in a new era of responsible, and enlightened reef development that expands beyond our historically myopic approach and pursues the full range of fishery benefits achievable through artificial reef construction.

Second, I believe the act has opened our eyes to the need for more comprehensive reef planning and management. While somewhat general in nature, the NARP encourages the development of more specific state and local artificial reef plans. A flurry of activity has already occurred. New Jersey, Puerto Rico, and Louisiana have developed and implemented plans, and a regional plan has been developed for the Northern Gulf covering offshore areas from Destin, FL, west to Louisiana. Exclusion mapping has been completed for the entire Gulf. Further, New York, Maryland, Washington, D.C., North Carolina, South Carolina, and many counties are developing plans.

Third, requiring reef permit applicants to demonstrate that they have the financial ability to assume any liability that may be associated with reef development will precipitate more responsible efforts and will tend to shift reef development activity from private interests to the government sector. Most government bodies have less exposure to liability due to sovereign immunity provisions of most stable constitutions. Government should play more of a leadership role in the future.

Fourth, while no funds were appropriated by the act, pressure is mounting for government to be more actively involved in artificial reef research and development. Evidence of increased government interest and involvement exists.

Fifth, while untested by the courts, liability limitations imposed by the act should encourage greater private sector donations of reef construction material.

Last, representing the federal agency responsible for marine fisheries management and development, I can assure you the act has further piqued the interest of the National Marine Fisheries Service in using artificial reefs as a fishery management tool. We are already increasing our involvement in artificial reef research, planning, and management.

In summary, the National Fishing Enhancement Act is a significant new law that promises to substantially affect the nature of artificial reef development in the U.S. A new stage has been set upon which artificial reefs stand to play a more diverse and important role. Thank you for your kind attention.

Federal Artificial Reef Permitting Requirements: U.S. Army Corps of Engineers Criteria

John Adams
Chief, Regulatory Division, U.S. Army Corps of Engineers, Jacksonville, Florida

GOOD MORNING, ladies and gentlemen. I am John Adams, Chief of the Regulatory Division, U.S. Army Corps of Engineers, Jacksonville, Florida. As chief of the regulatory division, I have the overall staff responsibility for the Corps' dredge and fill permit program within the State of Florida, Puerto Rico, and the U.S. Virgin Islands.

As I am sure you are aware, the Corps of Engineers regulates the construction of artificial reefs pursuant to Section 10 of the Rivers and Harbors Act of 1899. In addition, authority under Section 10 was extended to the outer limits of the outer continental shelf by the Outer Continental Shelf's Lands Act. Also, permits are required pursuant to Section 404 of the Clean Water Act.

The history of permitting artificial reefs is lacking. From review of the records that we are able to uncover, very few permits were issued for artificial reefs prior to 1960. We did uncover the first authorization, being the placement of a reef in the year 1918. Between the years 1960 and 1970, approximately 30 permits were issued. In the next 10-year period, between 1970 and 1980, approximately 85 permits were issued. In the period between 1980 and April 11, 1984, there were approximately 25 authorizations granted.

On April 11, 1984, the Jacksonville district issued a general permit, referred to as SAJ-50, which covers the installation of artificial fishing reefs and fish attractors in waters of the State of Florida, the Commonwealth of Puerto Rico, and the U.S. Territory of the Virgin Islands. The areas off the State of Florida most commonly used for installation of artificial reefs have been offshore from Dade, Duval, Pinellas, and Bay Counties. Since authorization of the general permit, 179 activities have been authorized.

General Permit Criteria

The criteria in order to qualify for this general permit are as follows:

1) You must submit suitable plans, to include drawings, to the Corps of Engineers and obtain written approval from the Corps of Engineers. This information must include the following: site location, expressed in both latitude and longitude and Loran C coordinates; water depth, measured in feet from mean sea level; proximity to shipping lanes and general navigational channels; types, quantities, and on-site orientation of materials to be used for the reef; description of site condition, as evidenced by marine survey or inspection performed by a qualified party. All material placed on the artificial reef must be clean and free of pollutants.

2) No artificial reefs shall be authorized that constitute a hazard to or from shipping interests, general navigation, and/or military restricted zones. The same is true for designated danger zones.

3) No authorization will be granted in established shrimp, fish, and shellfish trawling areas unless after evaluation, and in the opinion of the Corps of Engineers, such construction would not constitute a hazard to those trawling activities.

4) All marking requirements shall be in accordance with the U.S. Coast Guard requirements and evidenced by a letter from the U.S. Coast Guard which the applicant must provide.

5) No permit authorization would be granted around national historic sites or federal or state parks, preserves, marine sanctuaries, or wildlife management areas.

6) No authorization will be granted where there are significant submerged beds of sea grasses, coral reefs, or other valuable underwater habitat.

7) No authorization will be granted that may affect endangered species or their critical habitat. After reviewing these items and insuring that the proper criteria have been met, the Corps will provide a letter of authorization, along with all conditions that must be adhered to, to the applicant. In addition, copies of this will be provided to the defense mapping agency, the Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Ocean Survey of NOAA, the National Marine Fisheries Service, and both southeast regional and Washington offices of the U.S. Coast Guard, the appropriate state agencies, and the appropriate fisheries management councils, i.e. South Atlantic, Gulf, or Caribbean.

Corps Authorization

Generally speaking, the Corps of Engineers has found no major problems with approving artificial reefs. However, if the conditions I have mentioned today are not followed and adhered to, then authorization will not be granted and, if necessary, enforcement action will be initiated to correct problems that may have occurred.

I thank you very much for giving me the opportunity to speak today. If we have time for questions, I will now address them.

Federal Artificial Reef Permitting Requirements: U.S. Coast Guard Criteria

Paul R. Von Protz
Lt. Commander, U.S. Coast Guard, Chief, Merchant Vessel Safety Branch, Seventh District, Miami, Florida

IF JOHN [John Adams, Corps of Engineers] lets you do it, then you've got to face the Coast Guard. So, I have a few things I would like to comment on. First of all, I want to make sure everybody is aware that the Seventh Coast Guard District covers most of Florida but it does not cover the Panhandle, covered by the Eighth Coast Guard District Office in New Orleans. The Coast Guard is undergoing many revisions; I wanted to make sure you were aware of these, particularly address changes for the Coast Guard Districts, since the brochure is now outdated.

The First Coast Guard District is now located at 408 Atlantic Avenue, Boston, MA 02114. There is no longer a Third or Twelfth Coast Guard District. The Seventh Coast Guard District here in Miami, effective the 15th of November, will be moving to the Brickell Plaza Building and the address is 909 Brickell Plaza, and the zip code is 33131.

New Interest in Reefs

One of the other things we talked about here is the interest in reefs. One of the new developments involving reefs is the passenger-carrying submarine, the first of which was certificated by the Coast Guard in July of this year. One now operates in St. Thomas, carrying 49 people to a depth of 150 feet. It is expected that in the next two years there will be submarines operating off the coast of Florida that will be carrying passengers. So, this is another interest of people, going down to look at these reefs in submarines.

John did not mention Public Laws 92-402 and 98-623, which refer to the availability of vessels to be used as artificial reefs. Basically, if the U.S. Government has surplus vessels in its maritime reserve fleet that are no longer useful to the government, they are available, free of charge, to interested organizations. Make sure you have the details on those laws.

Another very important factor is that the Coast Guard, as well as NOAA, are going to be changing the latitude and longitude coordinates. You all should be aware that we are in the process of changing the latitude and longitude of all geographical points within the United States to shift to the North American datum. So, when you are submitting your permits, please indicate which latitude and longitude you are going to use. In Florida, we're talking about a shift of about 300 yards. In Puerto Rico, that can be up to a half mile. So, please be aware of that when you submit data.

One of the things Mr. Adams talked about was legal ramifications. I had our legal office go through various court cases, and they were able to get the published ones up to 1984. There were no specific court cases dealing with artificial reefs; however, there was a very important one that you should be aware of, handled by the Federal Court out of New Hampshire. That case was where bombers were taking off from an Air Force Base up there using JATO [jet-assisted take-off] racks; and as they got out over the sea, they dropped these JATO racks into the water and indeed fishermen kept snagging their nets on them, suing the Air Force for the cost of the lost nets. Finally the Air Force got tired of paying for nets, because these were all eventually promulgated on the charts and Notice to Mariners.

However, when the Air Force stopped paying, they were taken to the court. The Federal Court ruled on behalf of the government, saying that the fishermen were given notice that indeed there were obstructions down there. That is the only court case that our legal staff could find, but it sets a precedent that it is absolutely essential that you have the permit and then follow it up by the appropriate Notice to Mariners, and marking it on the chart.

There are several cases that I am personally aware of. For example, an artificial reef off Jacksonville was snagged by the net of a trawler. The trawler was lost along with seven persons aboard. There is pending litigation now which has not yet gone to court. However, in that particular case, which happened to be a drill rig, the artificial reef was permitted and marked upon the chart. If this case goes the same way as the first one, then the courts would find the permit holder not at fault. Then, indeed, the permit, the notification, the marking leave no liability on the part of the reef owners, or the government for allowing the reef to be there. On the other hand, if it is a "midnight" reef, and someone finds out who put it there, then indeed the legal decision may go the other way.

Vessel Safety

The biggest role in reef building that the Coast Guard plays is after the fact, especially involving vessels. Once a vessel has been identified, then the Coast Guard gets directly involved to insure that the vessel is examined for the presence of any hazardous materials, oils, chemicals, and so on, and obstructions that are going to float free. For example, on a steel vessel there are a lot of things that could float up once the vessel sinks.

Finally, the Coast Guard wants to make sure that the vessel gets safely from where it is to its intended destination as a reef. Within the Coast Guard organization, the people taking care of the examinations are usually in the Marine Safety Office.

Let me give you an example of the Coast Guard Cutters Bibb and Duane that were sitting in Boston and are going to be sunk probably in December off Key Largo as an artificial reef. The Marine Safety Office in Boston examined the vessels to make sure that they could be safely towed to New York. The Marine Inspection Office in New York is aboard the vessel now examining it as goes through its cleaning process, and then the Marine Inspection Office will make sure the tugboats and the vessel condition are suitable for towing down to Florida. Once it gets down to Florida, the Marine Safety Office in Miami will be directly involved in putting a security zone around the vessel to keep away people who could hamper the operations and to insure the safety of people aboard the vessel prior to the sinking. So, the Coast Guard is directly involved there.

Also in the audience is Lt. Lauzon. She is involved with the Aids to Navigation Branch. Her section handles navigation aids for artificial reefs.

Editor's Note: To apply for permits for marking artificial reefs contact the appropriate U.S. Coast Guard District Office.

Jacksonville to St. Marks
Commander (OAN)
U.S. Coast Guard, 7th District
Attn: Private Aids to Navigation
909 S.E. 1st Avenue
Miami, FL 33131-3050
Phone: 305/536-5621

Panhandle of Florida (St. Marks River Westward)

Commander (OAN)
U.S. Coast Guard, 8th District
Attn: Chief, Private Aids Section
500 Camp Street
New Orleans, LA 70120-3396
Phone: 504/589-6236

The following criteria (dated March 10, 1987) for marking of artificial reefs were provided by the Private Aids Section, U.S. Coast Guard, Eighth District (OAN). The following criteria are only required in the Eighth District portion of Florida. Requirements for marking of artificial reefs in the Seventh District are reviewed on a case by case basis. Contact the Private Aids Section (see address on page 19) for specific questions.

Marking of Artificial Fishing Reefs

The general rules relating to the marking of structures, sunken vessels, and other obstructions to navigation are prescribed by 33 Code of Federal Regulations Part 64, with references to Parts 62 and 66. Artificial fishing reefs may be obstructions to navigation and are marked generally in the same fashion as underwater completions, i.e. in accordance with current Eighth District "Guidelines for Marking Submerged Artificial Structures in the Gulf of Mexico." This essentially means reefs with less than 85 feet of clearance require Lighted Special Purpose Markings that conform to the International Association of Lighthouse Authority (IALA) Agreement Region "B" Marking system. Reefs with more than 85 feet require only unlighted yellow special marks unless within 500 yards of a fairway, channel, or anchorage where lighted lateral marks are required.

Reefs Extending up to One-half Mile from Center

If less than 85 feet of water clearance, one lighted six-second yellow special purpose marker in the center of the reef is required.

If over 85 but less than 200 feet of water clearance, one unlighted special purpose marker in the center of the reef is required.

If over 200 feet of water clearance, no marking is required.

If located within 500 yards of a fairway, channel, or anchorage, a quick flashing lateral (red or green) marker between the edge of the reef and the fairway is needed. This is in addition to the yellow special purpose marker located in the center of the reef.

Reefs Extending up to 1 Mile from Center

If less than 85 feet of water clearance, one lighted six-second yellow special purpose marker on each corner of the reef complex is required.

If over 85 but less than 200 feet of water clearance one unlighted special purpose marker on each corner of the reef complex is required.If over 200 feet of water clearance, no marking is required.

If located within 500 yards of a fairway, channel, or anchorage, a quick flashing lateral (red or green) marker between the edge of the reef and the fairway is needed. This is in addition to the yellow special purpose marker indicated above.

Reefs Extending over 1 Mile from Center

If less than 85 feet of water clearance, one lighted six-second yellow special purpose marker on each corner of the reef complex is required, with additional markers centered at 1-mile intervals around the circumference as determined by Commander, Eighth Coast Guard District.

If over 85 but less than 200 feet of water clearance, one unlighted special purpose

marker on each corner of the reef complex is needed with additional markers centered at 1-mile intervals around the circumference as determined by Commander, Eighth Coast Guard District.

If over 200 feet of water clearance, no marking is required.

If located within 500 yards of a fairway, channel, or anchorage, a quick flashing lateral (red or green) marker between the edge of the reef and the fairway is needed. This is in addition to the yellow special purpose markers indicated above.

Waivers

Owners of reefs may apply for waivers of some marking requirements.

1) A waiver *may be* granted for the lighted buoy requirement on reefs with over 50 feet of water clearance. 2) A waiver *may be* granted for the marking requirement on reefs with over 85 feet of water clearance once the reef is charted on navigational charts.

The following requirements must be met for consideration of granting a waiver.

1) The reef structure is over 2 miles from fairways, channels, or anchorages. 2) Clearance is over 50 feet of water. 3) The entire reef complex is adequately marked/charted. 4) The individual reef structure is part of an overall reef plan involving a number of such reefs. 5) Historically no deep draft traffic transits the area.

Identification

For record purposes and to identify buoys lost from their assigned location, an identification number will be assigned to each buoy on the returned copy of the approved Private Aid to Navigation Application Form (CG-2554). This identification number will consist of the letters "FR" indicating fishing reef followed by the postal abbreviation for the state that the reef is located offshore from, followed by a number (e.g. FR-TX-3). If the reef requires more than one buoy a letter suffix is assigned (e.g. FR-TX-3A) to distinguish different buoys. This identification must be displayed at least once on buoys and should be in block style lettering, contrasting with the color of the buoy. The lettering should be no smaller than 3 inches in height, and larger if space allows.

Additional Remarks

Existing markings may remain in use. When need to replace or change arises, new markings must meet these guidelines. All new reef permits will be marked in accordance with these guidelines.

Each reef will be marked on a case by case basis. Final determination of markings will be made by Commander, Eighth Coast Guard District.

These guidelines are subject to change and are not hardset rules but are an aid to determine the proper markings required for artificial reefs.

Florida Artificial Reef Permitting Requirements: Department of Environmental Regulation

Larry O'Donnell
Regional Director, Division of Permitting, Florida Department of Environmental Regulation, West Palm Beach, Florida

I THINK John Adams [Corps of Engineers] said it all when he went through the permitting reviews for the federal level, and I think as far as the Florida Department of Environmental Regulation (DER) is concerned just about everything John said, I'm going to mimic in my presentation today.

DER is a relatively young agency as far as permitting agencies are concerned. It was formed in 1975, and one of its primary functions was the evaluation and processing of dredge and fill permit applications. The construction of artificial reefs is considered a dredge and fill activity, and thus would require a dredge and fill permit from the department.

DER Permit Process

The permit process is handled in six distinct locations throughout the State of Florida. They are handled in the Panhandle in the Pensacola Office, also in Jacksonville, Orlando, and West Palm Beach, for the Atlantic Coast and on the West Coast in Tampa and Ft. Myers. They are not handled in the Tallahassee Office, and for those of you that are involved in the permit process, this will probably be a welcome relief for you! The permit process is just about the same as John outlined. In order for the department to process an application, it needs the filled out application, a processing fee of $100, appropriate drawings showing the location, the height of the reef, the type of material to be found on the reef, and the transportation routes to and from the reef.

When the department evaluates permit applications, it evaluates them under a two-step process. There are two concerns that DER has, which are pretty much common sense: water quality and public interest. As for water quality, the applicant must be able to demonstrate to the department that state water quality standards are not going to be violated as a result of the proposed activity, in this case a reef. If it is a vessel that is going to be sunk, the department is going to have concerns that all the oil products are going to be removed and that the vessel is going to be cleaned up before it is sunk. The second concern is a little bit more complex, and it is called a public interest test. There are seven criteria that the department uses when it evaluates the permit application for public interest:

- whether the project is going to affect the public health, safety, welfare, or property of others.
- whether the project will adversely affect the conservation of fish and wildlife
- whether the project will adversely affect navigation or erosion (DER is not an expert in navigation; therefore, as part of the permitting process, it will usually check with the Corps of Engineers or the U.S. Coast Guard to help make the decision about navigation)
- whether the project will adversely affect fishing, recreational value, or marine productivity
- whether the project will be a temporary or permanent structure
- whether the project will affect or enhance historical or archaeological resources

- whether the current condition, or functions being performed by the proposed permit areas, would be affected by the proposed activity. The department's concern here is an assessment of how existing site activity will be affected by what is being proposed for placement there. In the case of reefs, usually that is going to be an environmental plus.

General Permit

The permitting process normally takes anywhere from three to six months. However, there is good news! Back in 1984, DER came out with a general permit. I didn't realize that our general permit came out at the same time as that of the Corps of Engineers, but it did. This general permit process will streamline this three- to six-month permitting period down to just a couple of weeks, provided that certain data are obtained in advance. It is also free.

I would like to go over some of the concerns mentioned in the general permit for artificial reefs, which are also in the handouts that I'll leave at the front table.

1) The material to be used shall be clean concrete, or rock, or clean steel boat hulls.

2) The material shall be free of soils, oils, greases, debris, litter, and other pollutants.

3) The material shall be firmly anchored to the bottom and shall not be indiscriminately dumped. We are having some trouble with this one because we are dealing with a lot of people right now who just want to find a spot out in the ocean and dump a lot of concrete products. We're also having trouble getting people to narrow down their zone of dumping.

4) The material shall be placed so that the top of the reef does not exceed half the distance from the bottom to the surface of the water unless a greater distance is required for safe navigation. At no time shall the distance between the top of the reef and the surface of the water be less than six feet. This general permit was written for all types of occasions, not only for ocean reefs, but also considerations for freshwater and estuarine reefs.

There are some conditions that are associated with the obtaining of a general permit: that there shall be no reefs constructed in shallow bay or estuarine bottoms; that there shall be no "white goods," asphalt material, tires, or other pollutant materials used in construction of the reef; and that the site shall be marked with buoys to ensure that no material is deposited outside of the site. What we are finding is that people are placing the buoys and a day later they are gone, and I don't know how they are going to solve that. Hopefully, we can substitute Loran coordinates instead of the buoys.

Another bit of good news for those of you who have to deal with the permitting process is that the department is in the process right now of coordinating permitting with the local programs, especially here in Dade, Broward, and Palm Beach Counties. We're trying to delegate some of the general permits to these local programs; so that, rather than dealing with the state and a federal and a local agency, you might be able to eliminate at least one step in the process.

Florida Artificial Reef Permitting Requirements: Department of Natural Resources

Casey Fitzgerald
Chief, Bureau of State Lands Management, Division of State Lands, Florida Department of Natural Resources, Tallahassee, Florida

THE GOVERNOR and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, assume the fiduciary responsibilities of managing sovereign submerged lands on behalf of the citizens of Florida. The Florida Department of Natural Resources (DNR), Division of State Lands, performs all staff duties and functions regarding the administration of these lands.

Statutory/Rule Framework

The primary statutory authority for the Division of State Lands is found in Chapters 253 and 258, Florida Statutes. The administrative rules which implement the statutory authority include the following:

- Chapter 18-14 Administrative Fines
- Chapter 18-18 Biscayne Bay Aquatic Preserve
- Chapter 18-20 Florida's Aquatic Preserves
- Chapter 18-21 Sovereignty Submerged Lands Management.

Chapter 18-21 is the general rule which applies to all submerged lands whereas Chapters 18-18 and 18-20 apply to areas of special management, e.g. aquatic preserves.

Reef Application Review Process

Form of Consent Required

A *consent of use* (letter of consent) is required from the department for artificial reefs for public use (Subparagraph 18-21.005(1)(a)8, FAC)

Requirements for Approval

1) FDER/U.S. ACOE Joint Permit Application
2) Adequate location description
3) Comments or approvals from other involved agencies

Coordination with Other Agencies

1) Department of Environmental Regulation: water quality
2) Army Corps of Engineers: navigation issues
3) Local governments: local artificial reef areas
4) FDNR, Division of Beaches and Shores: borrowsite areas/renourishment projects
5) FDNR, Bureau of Land and Aquatic Resource Management: aquatic preserve concerns
6) FDNR, Division of Marine Resources (Virginia Vail): funds, mapping, etc.

Areas of Special Management: Additional Requirements for Aquatic Preserves

1) Approval of an artificial reef may be granted if the activity is deemed a public necessity or is necessary to enhance the quality or utility of the preserve (18-20.004(1)(e)10, FAC).
2) In determining whether or not to approve a proposed activity, a balancing test

is employed to determine whether the social, economic, and/or environmental benefits clearly exceed the costs. Note that listed as an example of specific benefits is "improving fishery habitat through the establishment of artificial reefs, or other such projects, where appropriate" (18-20.004(2)(d)5, FAC).

3) Aquatic preserve management plans, as adopted, further define the preferred management strategy for individual preserves.

Applications for Special Management Zones Around Artificial Reefs

Gregg T. Waugh
Fisheries Biologist, South Atlantic Fisheries Management Council, Charleston, South Carolina

ARTIFICIAL reefs and fish attraction devices (FADs) are expensive to construct and have limited advantages that can be rapidly dissipated by certain types of fishing gear (e.g. traps harvesting black sea bass from artificial reefs). Fishing gear that offers "exceptional advantages" over other gear to the point of eliminating the incentive for artificial reefs and fish attraction devices for users with other types of fishing gear prevent improved fishing opportunities that would not otherwise exist. The intent of a Special Management Zone (SMZ) is to create the incentive to establish artificial reefs and FADs that will increase biological production and/or create fishing opportunities that would not otherwise exist.

Management Measure 17 of the Snapper-Grouper Fishery Management Plan (FMP), March 1983, is as follows.

Prohibition or Restraint of Specific Fishing Gear From Artificial Reefs

> Upon request to the [South Atlantic Fisheries Management] Council from the permittee (possessor of a Corps of Engineers permit) for any artificial reef or fish attraction device (or other modification of habitat for the purpose of fishing) the modified area and an appropriate surrounding area may be designated as a Special Management Zone (SMZ) that prohibits or restrains the use of specific types of fishing gear that are not compatible with the intent of the permittee for the artificial reef or fish attraction device. This will be done by regulatory amendment similar to adding or changing minimum sizes (Section 10.2.3):

1) A monitoring team will evaluate the request in the form of a written report considering the following criteria: (a) fairness and equity, (b) promote conservation and (c) excessive shares.

2) At the request of the Steering Committee, the Council Chairman may schedule meetings of the Advisory Panel (AP) and/or Scientific and Statistical Committee (SSC) to review the report and associated documents and to advise the Council. The Council Chairman may also schedule public hearings.

3) The Council, following review of the Team's report, supporting data, public comments, and other relevant information, may recommend to the Southeast Regional Director (RD) of the National Marine Fisheries Service that a SMZ be approved. Such a recommendation would be accompanied by all relevant background data.

4) The RD will review the Council's recommendation, and, if he concurs in the recommendation, will propose regulations in accordance with the recommenda-

The monitoring team is composed of members of the council staff, Fishery Operations Branch (Southeast Region, NMFS), and the NMFS Southeast Fisheries Center.

tions. He may also reject the recommendation, providing written reasons for rejection.

5) If the RD concurs in the Council's recommendations, he shall publish proposed regulations in the *Federal Register* and shall afford a reasonable period for public comment which is consistent with the urgency of the need to implement the management measure(s).

SMZ Objectives

The opportunity to request the council to designate a SMZ is open to all permit holders and could focus on gear restrictions applicable to any and/or all user groups. Thus far, only requests in support of gear restrictions for fish traps, hydraulic/electric reels, longlines, and spearfishing have been received by the council. Objectives approved by the committee and council are as follows.

1) Establish SMZs that prohibit or restrain the use of specific types of fishing gear in order to promote orderly utilization of the resource and reduce user group conflicts.

2) Create incentives to establish artificial reefs and fish attraction devices by maintaining the socioeconomic value consistent to the maximum extent practical with the intent of the permittee.

3) Optimize use of biological production and/or create fishing opportunities that would not otherwise exist, thereby maintaining and promoting conservation.

Criteria to be utilized are fairness and equity, promotion of conservation, excessive shares, ensurance that SMZs are consistent with the objectives of the FMP, the Magnuson Act, and other applicable law, consideration for the natural bottom in and surrounding potential SMZs and impacts on historical uses, and consideration for cumulative impacts.

Requests Received

South Carolina

Restrict the fishing methods used on artificial fishing reefs off the South Carolina coast to hand-held hook-and-line fishing and spearfishing and eliminate the taking of jewfish with powerheads (bangsticks).

Georgia Department of Natural Resources

Restrict the harvest of fish from SMZs to hand-held hook-and-line fishing and spearfishing by divers. Spearfishing in these zones, it is recommended, should include the use of powerheads, except in the taking of jewfish, which should only be landed through hook-and-line and other spearfishing techniques.

The South Atlantic Fishery Management Council approved these two requests in October 1985, with an additional measure of "no possession or harvest of jewfish." Final regulations were effective March 27, 1987.

Dade County, Florida

Prohibit the use of fish traps, hydraulic and electric reels (later removed from request), bottom longlines, preloaded or power assisted powerheads, and spearguns.

Miami Sportfishing Club

Restrict the use of fish traps, power actuated (electric and hydraulic) reels, spear guns, and bottom longline gear.

The South Atlantic Fishery Management Council disapproved these requests in March 1987.

Ft. Pierce Sportfishing Club

Prohibit the use of fish traps, electric and hydraulic reels, all types of spearfishing gear, and bottom longlines.

The South Atlantic Fishery Management Council approved taking this request to public hearings in September 1987. A public hearing has been scheduled for November 19, 1987, with the council giving final consideration of this request at their meeting November 30 to December 3, 1987.

Table 1 illustrates the main factors evaluated during the council's deliberations concerning the first four requests. The Ft. Pierce request appears to be more similar to the approved sites in South Carolina and Georgia as indicated by these factors.

Table 1. Contrast of approved and disapproved SMZ requests.

	Approved SC/GA	Disapproved Dade County and Miami Sportfishing
Coordination	State	None
Research & monitoring	Economic/utilization	None initially, some on Site H
Shelf area	Wide	Narrow
Bottom type	Nonproductive	Productive
Existing fishery	No	Yes
Level of regulations	Low	High
Objections	None	Yes

Panel I Discussion

Changes and Challenges: New and Revised Agency Policies and Programs

Ronald L. Schmied, National Marine Fisheries Service, Moderator

Q Ron Lukens: To John Adams: you mentioned that in the permit there is a provision called "Responsibility for Maintenance." Do you have an interpretation of exactly what that means? What is responsibility for maintenance?

Q John Adams: Are you talking about as far as the reef itself?

A Lukens: Yes.

A Adams: It would depend on the individual case as to whether or not it is needed to insure that the reef itself is maintained. That would probably relate more to inshore fish attractors than it would to artificial reefs placed offshore.

Q Lukens: Okay. I think some of this might have been interpreted differently from the National Plan, in which it is an implied mandate to monitor and assess reefs to ascertain whether any maintenance needs to be done or whether some kind of log of the condition of the reefs needs to be kept. Is this perhaps part of this interpretation?

A Adams: It is not a requirement on our permit for the monitoring. We have not placed any requirement for monitoring to determine whether or not you're having an adverse impact with what's been placed on the bottom. We just go based on what knowledge is available at the time we are reviewing that particular application.

Q Lukens: Another question for you. I have had this question asked of me and couldn't answer it. If a group such as a fishing club, for instance, acquires permits for a reef and undertakes reef building activity for a number of years and for one reason or another disbands, the permit expires so no further construction can take place; however, there are still materials on that site, but the group responsible for those materials being there has disbanded. Do they still maintain liability, or responsibilities, to that reef site, or what happens? Does that site revert to the state, or has anything like that occurred?

A Adams: To be honest with you on liability, I don't know the answer to the question. Our permit authorizes the construction to occur, so that is what is authorized. If the party that did the construction disbands, I don't know what the answer would be on a liability question.

Q Lukens: One other question to Gregg Waugh. Does the Gulf Council, to your knowledge, have the SMZ provisions in the reef fish management plan?

A Gregg Waugh: No, they don't have the particular special management zone provision. They have a stressed area concept that does limit specific types of gear in certain areas. Doug Gregory is here from their staff and you might want to talk with him more. But their stressed area concept would allow you to do a similar type of management that our special management zone does.

Q Lukens: Is there a time limit on SMZs or a provision to re-evaluate SMZs after a certain period of time for the need of an SMZ?

A Waugh: There's no specific time period set up once a SMZ is granted. It certainly would be reviewed in an ongoing review of the entire snapper/grouper management plan. But no, there is no set time period.

A Ron Schmied: Maybe I could add a little bit to that. Under the Gulf [of Mexico Fishery Management] Council reef fish plan, the stressed area that Gregg alluded to is an area covering a continuous offshore band of varying distance from shore that runs all along the Florida west coast and along the Alabama and Mississippi shore. It stops at Louisiana, since there is no stressed area off Louisiana, and runs from the Louisiana/Texas line over to a point roughly offshore of the Freeport, Galveston area. There isn't a stressed zone as you go further down the Texas coast. In that zone, there are a number of prohibitions. No traps, no bottom trawls, no explosives, so on and so forth. So, if someone wanted to have an extra measure of protection in terms of harvest from a reef, it would be wise to site the reef within the stressed zone. There is a request for the council to amend the reef fish plan to include provisions for designation of special management zones. I think the Council is discussing that. Doug?

A Doug Gregory: Yes, there will be public hearings about this topic probably at the Council meetings in March or April of 1988.

Q Bob Clinger: I work for Palm Beach County and my question is directed to Lt. Commander Von Protz. One of the types of materials that Palm Beach County likes to use is concrete, and the way we get this out to the artificial reef site is by barge. I realize we are having a little bit of a problem right here in Palm Beach County, but it seems that the regulation affecting Palm Beach County is probably also one that could affect the statewide program; that is, that barges that go out of inlets have to have certain types of certification. Can you give us a little bit of insight on that? It seems that those regulations are somewhat prohibitive to construction of an artificial reef program in Palm Beach County.

A Lt. Comm. Paul Von Protz: What it boils down to is indeed that the marine safety offices have numerous violations of law where the barges that are hauling this material out are commercial barges. Commercial barges that operate beyond the safety boundary line are required to be documented and inspected for load lines. These vessels are not. In other words, the regulations were established so that a vessel that stayed within the harbor could meet minimum standards. Those that go out to sea, for protection of the property and people on board must meet higher standards. Indeed, the vessel must meet these requirements in order to go out. Most of the vessels don't. It is true that it will cost five times as much to get an inspected and certificated barge, but there are provisions where a barge that is not inspected can be brought under inspection. However, that requires final reviews, dry docking, and repairs. So yes, it is cost prohibitive, but we're getting a vessel that meets a higher standard for the safety of the people involved, as well as to insure it doesn't sink in the inlet, or half way to where it's supposed to be going.

Q Clinger: Because of the costs that are involved in having that type of certification and because there are so few certified barges available within our area, I am wondering if there is a possibility that the Coast Guard would consider some relaxation of those requirements, particularly, in Palm Beach County, where we are not going much over a mile or two miles offshore.

A Von Protz: First of all, we do it all the time. There are numerous barges available to Florida, maybe not many within Palm Beach County. But to certificate and inspect a vessel to only operate one mile offshore certainly can be done.

Remember the standards for certification and inspection vary depending on route, and obviously a barge that goes worldwide must be stronger than one that goes a mile offshore. So the Marine Safety Office is very flexible with enforcement of the standard that is applied. So, yes, that can be done.

Q Ed Kalakauskis: Gregg Waugh, I have a question for you. For the special management zones, do you have a method of policing these zones, and how do you plan to enforce the regulations that are established in these zones?

A Waugh: The council doesn't do any direct enforcement itself. Any regulations that are approved become federal law and they are enforced by the Coast Guard and the National Marine Fisheries Service. Also, in states that have cooperative enforcement agreements with the federal government, the local Marine Patrol does some enforcement. This is an item that we have received a lot of questions about. It is cost prohibitive to have directed enforcement, but I think a lot of the enforcement on these sites will come from people who are out using the resource [reefs], accessing those areas and reporting any violations. So, I think it tends to offset, but it is very expensive to enforce small pockets of area.

Q Kalakauskis: Well, that would lead me into my next question to the Coast Guard. If you are the reporting agency that one reports a violation of this act to, what would be the procedures in reporting that violation?

A Von Protz: Like I said, if we are aware that someone is midnight dumping, or dumping in the wrong spot, then we would investigate and pursue accordingly. Does that answer your question?

Q Kalakauskis: I think my question is directed to noticing particular fishing practices going on in these special management zones. How would you go about reporting it, and who would you report it to? Would it be to the Coast Guard?

A Von Protz: With respect to that, quite often the Coast Guard Cutters carry members of the National Marine Fisheries Service out as riders on our vessels. Our expertise is more in saving lives, not looking at fish nets; so, we'll have those people actually aboard vessels at certain times. If we have a report that something like that has happened, then we will carry some of their agents out.

A Schmied: If you have an observation of an apparent violation, all you do is call the regional office of the Marine Fisheries Service, at 813-893-3141, and we'll transfer you to law enforcement. We'll acknowledge the calls and do any follow-up that is appropriate. With regard to enforcement, our law enforcement people do utilize the Coast Guard vessels. We utilize other vessels. We can be very inventive in enforcing the law! We have cross-deputization with the State of Florida, so that Florida Marine Patrol officers can enforce federal law and our officers can enforce state law. That way we can utilize the resources of the Marine Patrol. I would say that enforcing provisions of a special management zone is a heck of a lot easier than enforcing some of the other regulations since you have a specific site. It's not that difficult to plant an enforcement officer on a vessel, and sit out there and watch. We can also follow up on reports from other fishermen in the area. We do intend and will enforce the law with respect to those areas.

Q Kalakauskis: Are there any cases now pending on people who have violated this law?

A Schmied: I am not aware of any at this point. It doesn't mean that there aren't any, but I am not aware of any.

Kalakauskis: That's my biggest concern. We've put a program in place that seems to improve the environment, but how are you going to enforce it, and once you do enforce it what are the wheels of the justice system going to do to turn it over. I haven't seen a case yet where these management zones have really helped in that aspect. Speaking for our area [NE Florida], in which we don't have any management zones but are looking at them in depth, enforcement is going to be the biggest problem we're going to have.

Schmied: Well, enforcement is a major concern in all of the fisheries arena, and if you have laws and you don't enforcement them the laws are ineffective. But those [SMZ] areas were just established and approved in March of this year, and we intend to proceed to monitor and take calls from people reporting violators and follow up as necessary.

Waugh: Let me just add that in South Carolina and Georgia, in the past, we have had reports of black sea bass pots being placed around the artificial reefs. I don't know of any enforcement up in that area. Certainly the existence of the special management zone has been well publicized. It went through this summer season, and I haven't heard of any complaints about fish pots being there. So, perhaps having it in place has eliminated the use of that gear, and I can follow up with our state people in those areas.

Q Richard Nielson, Jr.: Mr. Adams, one of your regulations in the general permit states that there will be no artificial reef sites within one mile of the Biscayne National Park or any other national parks, is that correct?

A Adams Yes, I think it is.

Q Nielson: How can you get around that if you wanted to have a permitted site outside a national park? Is there a way to get around that?

A Adams: You would have to apply for an individual permit. We would not be able to authorize a general permit. I think the chances of us approving it is going to be very slim, but we will go through an individual review and coordinate all the agencies represented here and the general public and additional local agencies to get comments and evaluate that particular proposal.

Q Nielson: Is that a new law or has that law been on the books for a long time?

A Adams: Now, this isn't a law that I am talking about. It is just within our general permit that criteria are laid out to say that if you want to apply for a reef permit, and if you meet these conditions, we will grant you approval for it. However, there is an indication there, especially in this general permit, if you can't meet those conditions, you probably will not obtain an approval. We will evaluate that. It is possible, depending on the particular situation, that you might be able to get an approval.

A Nielson: The reason that I was asking is because there are about five of them outside Biscayne National Park, and within the last month to two months, there was another permit issued for a reef where Biscayne National Park and Key Largo National Marine Sanctuary come together.

A Adams: I am not familiar with those particular ones. I can check into them for you if you would like.

Q Nielson: Yes, I would like that. Particularly, to see how people went about doing that when it is against one of your requirements.

Schmied: One quick follow-up. Under the general permit it says no authorization is given for such and such. However, if someone wants to proceed under the individual permit process and they go through the full blown public review process, it may take 30, 60, 90 days, or more to get approval. An approval could still be granted for some of these areas.

Jim Jeansonne: I am in the process of building an estuarine system of reefs within Tampa Bay, trying to get it up to about 10 or 12 reefs all together. We now have two reefs permitted and one pending currently. My question is directed to Larry O'Donnell, as it has to do with DER's permitting procedures. However, it's probably something that needs to be discussed as part of an overall reef plan. Under a general permit they mentioned things like, "don't put it in an estuary." Well, I already have two general permits and Tampa Bay is certainly an estuary from a biological or oceanographic standpoint, but has been designated as not an estuary for the general permit. I am not really objecting, but I would like to see some clarification. I understand also for a general permit, it's about a 30-day wait from the time you notify them of use of the general permit. For the regular permit I believe it's a 90-day clock, at least that's what we work on in our local area. Finally, concerning marking the areas, supposedly the area must be marked when building a reef, requiring that buoys be placed. I don't mind putting out the buoys, but I may want to modify the buoys, which can be a little confusing. The DER permit, of all the permits I have to get, including the Tampa Port Authority permit in addition to what most other people have to get, is the hardest to interpret. I would just hope that a state plan would help to direct the permitting procedures within DER, DNR, and other agencies. I don't know if you have any comments on these items. It's not exactly a question, and I apologize.

Larry O'Donnell: I don't think I want to touch that topic about Tampa Bay either. I don't work over in that area; so, I don't know all the particulars. The only comment I can give you is that the general permit process was designed to cut down on the amount of time spent in processing. That if you could meet A, B, C, D, and E on the specific criteria, you automatically got a permit. There was no field inspection required. There was no fee. There is no time clock. If obviously you don't meet A, B, C, D, and E, you'll have to go through the full blown process which depends on you supplying additional information to us to evaluate a permit application, and that can be a lengthy process.

Jeansonne: I get the impression at least at the local level that, when I apply for a regular permit which is specified as a short form, I am not sure of the expertise at DER in relationship to the general expertise in our local community. In other words, I am not sure the expertise to evaluate artificial reef permits exists in-house in DER and that concerns me.

O'Donnell: You are right. DER traditionally has had a very high turnover rate for numerous reasons and the expertise is not there in all cases. We do coordinate with other agencies and try to work the specific permit applications as best we can, and I agree with you. But, I don't have a solution.

Jeansonne: I guess I am just trying to present some of these things as items I hope would be addressed in a state artificial reef plan. Those items could then be made part of the regular DER procedure and possibly some expertise could be then utilized on a regular basis by DER people. Even though I have only been running a program for a year, I sometimes feel like they should be coming to me, or at least other people like Heyward Mathews, for certain specific information. They are trying to do it in-house, and it is a little difficult for them I think.

Q Bob Engel: John [Adams], is the Naval Defense interested in these reef permits as far as metallic structures, or this type of thing? Are they actually using this [permit] to monitor where these locations are?

A Adams: It is my understanding that that is not as critical anymore as it used to be 20 years ago. We do provide copies to the defense mapping agencies so they will have the information available. However, I don't think that is as big a problem as it was 20 or 30 years ago when we had to get assurances from the Navy that there was no problem before we ran authorization.

Q Engel: One more question for Casey Fitzgerald. It seems that new regulations and paperwork are becoming more popular with the state on artificial reefs, but from DNR's standpoint, what about encouragement and sponsorship for new funding to help artificial reef building? I know that the Governor just vetoed a $3 million project to design and build some reefs. Can you shed any light on that?

A Casey Fitzgerald: Probably not! I think that the issue of funding for these types of projects has just been called into question lately along with services issues. We also have put on hold about $30 million of beach renourishment money, as well, so this is just one of those things that is not going to be a high priority until some reasonable tax base is established. We may have to look for more private funds as a net result as far as I can see right now.

Schmied: Obviously, there is always the avenue available of contacting your local representatives and letting them know how important this kind of activity is to your community.

Responsible Reef Development: A Commercial Fisherman's Perspective

Joan S. Butler
Deputy Executive Director, Organized Fishermen of Florida, Tallahassee, Florida

IN JANUARY 1987, the Board of Directors of the Organized Fishermen of Florida adopted a resolution requesting that no further permitting of artificial reefs in Florida be done until the completion of research showing that artificial reefs are not harmful to the long-term welfare of our natural ecosystems. Realizing that our concerns alone will not lead to the temporary halting of reef construction in this state, we are presenting recommendations for improving the reef construction process that exists in Florida today.

To the commercial fishermen, site selection and materials placement are the most disturbing aspects of individual reef construction projects. From a social perspective, a primary objective of site selection should be to minimize encroachment on a commercial fisherman's access or use of traditional productive fishing grounds. Unfortunately reefs are often sited in areas of ongoing commercial fishing operations, and the commercial fisherman is forced to move to avoid artificial reef materials that create unfishable obstructions for certain commercial gear. We feel it is absolutely necessary that reef builders integrate local commercial interests into the site selection process from the outset. Reef placement should avoid the undesirable effect of eliminating areas of the ocean from seafood production. Additionally, artificial reef construction should not be used as justification to deliberately exclude commercial fishermen, who produce seafood for all our citizens, from access to large areas of our public ocean resources.

Preserve Traditional Fishing Grounds

Our first specific recommendation is to require that permittees be responsible for nonencroachment on traditional commercial fishing grounds through a mandatory formal process of consultation with local fishing industry representatives. This formal consultation should be done prior to any permit application or issuance. No permit should be issued without this.

From a biological aspect, commercial fishermen are concerned by placement of artificial reefs in already productive fishing areas. The primary objective is obviously to concentrate fish and create a hot spot for anglers at a convenient site. Site selection is sometimes based on popularity, politics, convenience, and economic return for particular local interests. These are sometimes valid reasons for choices, but these should not be overriding factors when we are talking about making permanent habitat changes. Site inspection should include biological assessments of the area--not just a diver down for a quick glance to confirm that the area is "barren bottom." Preconstruction biological monitoring and assessment are minimal or nonexistent and should be increased.

Fishermen have brought to my attention instances where reef materials wind up off the mark—the materials aren't placed at coordinates stated in the permit and contractors and permittees are not monitored or held responsible for accurate placement of these materials. We need a strict protocol for monitoring of materials placement, with mandatory performance standards.

Funds expended on artificial reef construction should be redirected. Department of Natural Resources reef program grants are used primarily for transportation of reef material to the site. No more than $1,000 of a possible $30,000 grant can be

used for engineering purposes, which includes site selection, reef design, and observation and inspection of materials placement. As a result, site selection and design are the weak links in the chain, when they should be the very foundation of a responsible reef program. This existing funding ratio should be reversed, with the major portion of a grant required to be spent on site selection, biological assessments, and professional reef design and construction.

We recommend redirection of effort and funds, both private and public, to engineering, site selection, and biological assessments and monitoring of areas before and after reef placement. Wallop-Breaux funds received by Florida and dedicated to artificial reefs should be redirected to artificial reef research to answer pressing basic questions of reef function and effect. Recent allocation of Wallop-Breaux funds to Florida allotted as great a percentage for reef construction alone (40%) as was allocated for all types of marine research. Let's redirect more of the limited amount of available funds to maintaining and restoring natural habitat. We have had exponentially increasing development of artificial reef sites. We need, instead, exponential development of research and monitoring on artificial reef function, and research on experimental larval and juvenile reefs which might truly enhance our resources.

Biological Questions

There are biological questions which concern members of OFF and must be answered. Are areas labeled "flat, barren, sand bottom" of no importance in the overall ecological scheme, and is their replacement by an artificial high relief area an "improvement?" Or do these so-called barren areas serve an important function in the marine environment? Wetlands were once considered useless, unproductive areas, prime areas for habitat "improvements" through filling, in order to be useful to man. They were looked at in much the same light as "barren, sand bottom" seems to be considered today by artificial reef devotees, as areas which should be altered to be useful to human activity.

Artificial reefs being built today are primarily for the specific purpose of increasing fishing success rates for anglers. This is often termed "fisheries enhancement" when the correct term is "fishing enhancement." Are fish merely relocated and their dispersion and behavioral habits altered? Increased fishing success does not necessarily equate with an increased total population. Artificial reefs undoubtedly subject those fish attracted to the site to an increased exploitation and harvest rate. They attract fish, as well as fishermen, and the result is increasing pressure. It seems logical that declines in resources in certain areas may be exacerbated by artificial reefs themselves—accelerating stock depletion by placing fish in a situation where they can be easily targeted by ever-increasing numbers of leisure fishermen.

Commercial gear is often denigrated as "overefficient" and thus heavily regulated or prohibited. Perhaps artificial reefs may be acting as an overefficient habitat alteration device. Fish-attracting devices (FADs) are particularly problematic, since these are placed solely for the purpose of changing migratory patterns and concentrating pelagic species. No scientist has suggested that FADs increase biological productivity in any manner.

Establish a State Reef Program

The rate of reef placement and permit issuance in Florida is increasing rapidly, currently at the rate of two each month—an alarming rate for altering ocean bottom habitat. We are faced with the snowball turning into an avalanche. We recommend establishment of a formal state artificial reef program under the Florida Department of Natural Resources through which all reef permit applications must be approved, possibly a program with the state as sole permittee for any artificial

reef construction. Artificial reef placement should be part of a holistic program of responsible, integrated resource management.

Public policy and public perception already consider artificial reefs a "benefit" for many reasons. Artificial reef construction creates convenient sites for disposal of large solid-waste materials, provides tax write-offs for corporations and individuals, and serves as public relations projects for local governments. Artificial reef construction is often the pet project or even the *raison d'être* for private clubs. Yet are we working at cross purposes to our fishery conservation and management measures and our desire to protect and preserve our natural habitat? On one hand, our state and federal government are spending millions of tax dollars purchasing land in order to prevent its physical alteration by man and keep it in its natural state. Private organizations such as Nature Conservancy and Trust for Public Lands are engaged in the same effort. Yet on the other hand, as regards our ocean bottom, public policy is to promote and provide funding for its physical alteration.

Degradation of fishery resource habitats and overfishing are considered the two greatest threats to our fishery resources. One has to wonder if artificial reefs contribute to these two factors. Artificial reefs are certainly changing habitat; from the ecosystem viewpoint is this change a degradation or an improvement? We really need to get closer to the answer before we wholeheartedly embrace massive reef construction as "good" public policy. Let's take reef construction out of the realm of politics and public relations projects. A permanent man-made environmental change, particularly one as little understood as artificial reefs, should be treated with much more seriousness, formality, and deliberation than is currently done.

Summary of Recommendations

1) Commercial fishermen formally involved in site selection prior to any permit application/issuance. Require permittees to be responsible for nonencroachment on traditional fishing grounds through a formal process of consultation with local commercial fishermen.

2) Mandatory performance standards for placement of reef materials. Require publication of Loran coordinates of reef materials so commercial fishermen can prevent loss of gear occasioned by entanglement.

3) No attempt to prevent free access of commercial fishermen to large areas around artificial reef sites.

4) More effort and dollars directed to basic research on artificial reef function. Grant money for reef construction now primarily expended for transportation of materials, should be redirected to scientific site selection, reef design, and biological assessments and monitoring.

5) Formal and expanded state artificial reef program, possibly with the state as the sole permittee.

6) No acceptance of artificial reefs as mitigation in exchange for permits to destroy natural reefs or shoreline. Before we accept artificial reefs as mitigation we must have more indication that they can replace destroyed natural functions.

Responsible Reef Development: A Sport Diver's Perspective

Dan Grizzard
Captain, Commercial Charter Diveboat and Scuba Instructor, Panama City, Florida

ARTIFICIAL reefs, like natural habitats, have always seen competition between user groups such as divers and fishermen. This will always be a reality. There is even competition between subgroups within each of the user groups, but divers are united behind the cause of more and better artificial reefs. As users of a limited commodity, we wish to contribute and push for improvement as well as use. Divers have always been in the forefront of this type of development if only for the simple reason that divers were needed.

Artificial reefs become a more needed resource everyday. More and more people are competing for a commodity that is not currently keeping up with the demand. Divers are now even more needed, not just for their ability to go underwater and report and move items around, but to become a force to assist in the development of future reef sites by helping physically, financially and, more importantly, politically.

Florida: Number 1 Diving Destination

Florida is the number one dive destination in the continental United States and one of the top rated "want to go to" places for divers anywhere in the world. In 1986, 17.8% of all SCUBA divers certified in the United States were certified in Florida. The median age of this group of "voters" was 30.8 years, with an average household income of $43,000. Eighty-three percent of these divers were from a college-educated background. This group of people is a source of political power alone, but coupled with the other groups with an interest in artificial reefs should prove unbeatable.

This large number of consumers is served by the diving industry of Florida. This industry, through organizations like FADO (Florida Association of Dive Operators), is beginning to organize to help accomplish many goals. The recent work in the Keys toward the sinking of a Coast Guard cutter is just an example of the events that should become more commonplace as the push for artificial reefs continues to grow. This list could go on and on to include not only FADO but the volunteer reef-monitoring organizations, the dive clubs with reef permits, and local organizations like the Panama City Marine Institute.

These comments and numbers are just a small step toward saying, "Yes, divers want more and better artificial reefs. Yes, divers have done and will continue to do their share to help develop artificial reefs."

Recognizing this effort and consensus, other groups also need to understand the contribution divers have made and the potential that is there. Also, there have been and will continue to be distinctly different types of diver activity, just as there are different types of fishing activity.

The mission of all the various groups must be to work together for the benefit of everyone. The answer is more statewide development, but also for more and better assistance to insure the quality, as well as the quantity, of the artificial reefs being developed. The process must stay in place for all the "successful" types of materials, but more effort has to continue toward the large, high-profile items, like Coast Guard cutters and submarines, that not only make excellent artificial reefs but also create the public relations bonanza that can further the cause of artificial reefs.

Responsible Reef Development: A Recreational Fisherman's Perspective

Ted Forsgren
Executive Director, Florida Conservation Association, Tallahassee, Florida

I THINK you have all seen and I think, if you are in this room, you understand the magnitude of artificial reef creation in the State of Florida. Although some of those early slides on local governmental activities show that a lot of money has been spent, I can assure you that there are some private groups, local sportfishing groups, or other interested parties that were behind the push to obtain that money. I think one thing that you will also learn as a result of this conference is that there is more to it than just attracting fish to artificial reefs; that artificial reefs also attract a lot of fishermen and probably more so than fish in some cases. When you have many fishermen competing with different types of commercial and recreational gear, you are going to have conflicts, and you are also going to have problems with respect to resource management.

I think from a management standpoint on reef-building, there are a couple of things that you need to lay out first in your overall planning. First, determine whether you are planning a site in state or federal waters because there would be a major difference in the type of fishing gear that can be used in and around the artificial reefs that you want to build. Remember the three-mile and ten-mile differences for state waters: that is, ten miles on the Gulf side and three miles on the Atlantic side. In the waters of the State of Florida, both fish traps and longlines for snapper/grouper are prohibited. So, the only place you are going to run into those conflicts, which have been so far the major conflicts in terms of artificial reefs, is in the federal zone. Also, I think it's important that we better understand the aggregation question, and what that means in terms of potential overharvesting for some species, like amberjack, which is very susceptible to being caught by a variety of different methods.

User Conflicts and Questions

Gregg Waugh spoke a little bit earlier about the South Atlantic Council and the various Special Management Zone applications that have been requested. What I would like to do is present a little more detail about the management conflicts and user questions that were involved in Dade County's Special Management Zone application, submitted for a series of reefs. These reef areas had been built either by a local government entity or by sportfishing clubs since the late 1950s. During the 50s, 60s, and 70s, they've put millions of dollars into building these reefs. The county went to the South Atlantic Council with the support of the county commission, with the support of their local, state, and congressional delegations, with a unanimous vote of the Florida Marine Fisheries Commission, a coalition of sportfishing clubs, and 14,000 petition signatures in favor of it, and they were rejected. They were rejected because a coalition of fish trappers made presentations as to what they felt was actually happening in the area; they were concerned about the displacement of those fishermen from the fishery.

I think that, hopefully, the South Atlantic Council may readdress this SMZ request at some point in the future, because the council, rather than looking at the question from a resource conservation perspective and from a user perspective to create the most benefits from a particular area, got into a question of voting along party lines among the council members. Essentially, members from North

Carolina, South Carolina, and Georgia voted against what was the unanimous support of the Florida people, and what was really a local user conflict when you look at it closer. What was happening off Dade County on these reefs had no biological impact on any migratory species or any other user questions in those other states that were north of Florida. Although it was characterized as a recreational/commercial-type battle, it was, in fact, a gear battle. What was proposed for prohibition within the SMZ were fish traps, bottom longlines, and power-assisted spear guns. All types of recreational and commercial fishing that use hook and line and other methods would still be allowed in the SMZ, and the real question was how would the harvest be allocated within the areas that they had developed. Was it going to be allocated as evenly as possible among a variety of different people, or would a smaller group of very highly efficient harvesters be allowed to use the reefs and take a large percentage of the harvest? Therefore, the question of harvesting concerns basically the reef fishes. I don't think that pelagic species were really considered.

The Special Management Zone was requested by Dade County because, in federal waters, that was the only mechanism that they had available to solve the resource problems that were developing, and they were considering the investment that they had put into the reef areas. A recent Sea Grant publication placed a current value somewhere between $17.5 and $128 million for their investment in their artificial reef program. So, Dade County wanted to protect something of major importance to their recreational fishermen.

Management Issues

As for future directions, I think you need to focus on two areas, both specific and general. Specifically, you've only got two ways to deal with the management issues around your artificial reefs in federal waters: 1) either a special management zone if you are in the South Atlantic, or 2) stressed area restrictions if you are in the Gulf. I can't emphasize enough the importance of reef site selection and having detailed pre-construction information to verify that there are no productive reef bottoms in the area and that there are no existing commercial recreational fisheries that are going to be displaced by reef development. This should be a written, predevelopment assessment. This was part of the debate in the Dade County issue: Who was there first? What were they doing? Nobody had monitored the resource uses since the 50s, and it was very difficult to make decisions from anecdotal information, from two sides with definitely different opinions.

From a larger, general standpoint, we need to look at how we are managing our fisheries and the gear types that are being used. I don't think anyone will disagree that grouper and snapper are going downhill, and that fish traps have been looked at in terms of a climax fishery. In other words, when you can no longer harvest sufficient amounts of fish with a particular gear type, you move to a more efficient gear type. Again, the more efficient gear type then expands in its usage. It's like the problem you have with lobster traps in the Keys. It takes more traps to catch just as many fish, and of course, it just ends up in a cycle ending in overcapitalization. I think that before something like this occurs, that gear ought to be looked at from an overall management standpoint before allowing its use.

Also, more study is needed on the species around reefs. For example, I am not aware of any work that's being done on amberjack; this species is suddenly desirable and people are catching a lot of them. There are some species that congregate around reefs that are, very susceptible to recreational and commercial fishing pressure. They ought to be more intensively studied to see what type of restrictions need to be there to maintain their productivity.

Last, I will put in a pitch for something that we [FCA] have been supportive of: that is, the saltwater recreational fishing license. We have talked about a dedicated

source of funding in order to do the necessary studies. We can talk about the need to study this, or the need to do that; but, if you're talking about whether the [general revenue] money will be allocated for schools, prisons, roads, or fishing, then you know that fishing is at the bottom of the list. Until we get a dedicated source of revenue, we are not going to be able to have the needed research done, or have the extra money to create the type of habitat that the research says is good. And, as talked about earlier, we're not going to have the enforcement capability that we need to protect what we are putting together.

Responsible Reef Development: A Research Perspective

James A. Bohnsack
Research Fisheries Biologist, Southeast Fisheries Center, National Marine Fisheries Service, Miami, Florida

SCIENCE provides methods for answering questions. Research involves making observation, describing events, forming hypotheses, experimentally manipulating variables, testing theories, and publishing results. In recent times, the focus of most research has shifted from purely descriptive to experimental (Popper, 1963).

Research on artificial reefs can be classified as fundamental or applied. Fundamental research addresses scientific questions that often have few or indirect practical applications. Examples include determining community organization and tests of ecological theory. This research can be important and may have future applied benefits. Applied research often addresses practical environmental or fishery-related problems, such as fishing success, design effectiveness, and increased primary production. Bohnsack and Sutherland (1985) and Buckley et al. (1985) provided reviews of important questions involving artificial reefs.

Reef Research Requirements

Artificial reef research can have unique needs depending on the question asked and local conditions. Usually, specific environmental conditions must be met, such as depth, bottom type, and proximity to shore. Specific reef design, construction, and placement are usually necessary. For fishery-related research, reefs tend to be larger (and more expensive) than those used for other types of research.

Some research requirements are generic and not tied to a particular question or local conditions. All artificial reef research requires clearly defined questions, adequate funding, sufficient sample replication, control sites, and monitoring programs of sufficient duration. Variables, such as fishing effort, reef size, design, and placement, must be manipulated and measured. Research using divers requires that reefs be placed within safe diving depths. Site monitoring must be initiated long before deploying reefs for studies on the effects of artificial reefs on surrounding biota.

Simple permitting requirements and rapid response by permitting agencies encourage research activities. Finding an adequate experimental site can be a problem. Pre-established artificial reef sites may not be adequate for some research purposes, especially if materials have been previously deployed on the site. Dade County has helped alleviate this problem by reserving a portion of a permitted site for research purposes.

Benefits from Cooperation

Cooperation from the public and government authorities to control public access and activities would benefit some research. Sites and equipment are often vandalized or inadvertently disturbed. Collecting information from reef users is necessary at times; fishery-related data on costs, benefits, fishing effort, total catch, catch composition, and length-frequencies are especially important. Relying on voluntary cooperation from users can limit data collection and jeopardize some experiments. Legislating the necessary regulations, obtaining sufficient enforcement, and securing public cooperation can be a problem.

Science would benefit if governmental agencies would place more emphasis on

publishing results in widely dispersed technical reports or in scientific journals versus internal agency reports which often are not accessible or may be lost. Too often publishing becomes a secondary priority, especially among governmental agencies with other responsibilities.

Literature Cited

Bohnsack, J.A. and D.L. Sutherland. 1985. Artificial reef research: a review with recommendations for future priorities. Bull. Mar. Sci. 37(1): 11-39.

Buckley, R., J. Grant and J. Stephens, Jr. 1985. Forward. Third International Artificial Reef Conference, 3-5 November 1983, Newport Beach, California. Bull. Mar. Sci. 37(1): 1-2.

Popper, K.R. 1963. Science: Problems, aims, responsibilities. Federation of American Societies for Experimental Biology. Federation Proceedings 22(4): 961-972.

Responsible Reef Development: A Management Perspective

Thomas H. Fraser
Vice-Chairman, Florida Marine Fisheries Commission, Port Charlotte, Florida

THE FLORIDA Marine Fisheries Commission has been given the authority by the Florida Legislature to manage and preserve Florida's renewable marine resources and has been delegated full rule-making authority over marine life with the exception of endangered species. My comments are made knowing that the commission has not yet undertaken any rule making with regard to artificial reefs in Florida.

What do commissioners think about artificial reefs? First, there exists a concern among all commissioners that there is no state program. A bill was introduced last year in the legislature that would direct DNR to develop a program with criteria and guidelines for artificial reefs and funding grants, but it was not passed. House Bill 16 has been filed for the 1988 session on this same topic. We support an active state plan and believe that the commission will be a part of that plan if it comes into existence for reasons to become apparent shortly. Florida will continue to have problems with the federal councils in designating special management zones in the Exclusive Economic Zone (EEZ) where appropriate, in the absence of such plans, for example, Dade County.

Second, some commissioners want a stop to new reefs being placed in Florida waters until the research that is underway determines how much enhancement and new biomass is created versus the ability to attract and concentrate pre-existing biomass. The latter of which may increase fishing mortality on species already under severe fishing stress or alter behavior of species so as to affect growth rates or reproductive success in a negative manner.

Third, at least one commissioner believes that the well known attractive characteristics will result in having these reefs fall under the commission's ability to regulate them as gear.

Fourth, most commissioners think that serious social/economic conflicts exist among many of the user groups. This is exacerbated by not having a state plan and because many reefs are the result of private and public endeavors, by or for specific user groups, most frequently sportfishing organizations. Some sort of zoning may be needed.

From this morning's first panel presentations, I believe that designed reefs need to increase from 2.3% to the predominant forms and the permitting system needs revision. There are no clear biological goals or assessments once a reef is in place.

What can the commission really do concerning artificial reefs? The commission has exclusive rule-making authority in several areas that may affect artificial reefs: gear specifications, prohibited gear, closed areas, seasons, bag limits, and size limits. For example, if it were shown that enhancing a nursery area were the primary use of a particular reef, the commission could close that reef to users that increase fishing mortality. By similar rationale, the commission could affect where reefs might be placed within state waters and what uses could be made of each reef. Such decisions must be based on the appropriate balancing of the statutory standards. Last, all commission rules must be approved by the governor and cabinet as head of the Department of Natural Resources.

Panel II Discussion

Reef Resource User Perspectives on Responsible Development

Joe Halusky, Florida Sea Grant Extension Program, Moderator

Leon DuFresne: I would like to address a question to Ms. Butler. What's your recommendation for getting commercial fishermen's viewpoints on where a reef is going to be placed to avoid some of the conflicts and interruption of their already existing fisheries? How do you get a good authoritative answer other than just going down to the local port and canvassing people?

Joan Butler: Well, until we get a formal state program in place, I would suggest one of the first places to start would be with our local Organized Fishermen of Florida chapters, and we could certainly provide you with a list of the chapters and the directors. They meet regularly. They're usually composed of all types of fishermen in the area, and we would be more than willing to give you our view of what would be a good reef site and what would not be a good site. We would also inform you of where our fishermen's fishing grounds are, where they operate, and what hinders them; so, I would say start through our local chapters throughout our organization.

Skip Hudson: Tom [Fraser], you brought out a good point there about designed reefs, but I think Florida is particularly headed in the wrong direction because we have so many commissions and agencies that they don't work together. Take, for example, our county's solid waste disposal system for only 83,000 people, which costs $2.5 million a year to operate. I believe that designed reefs are fine, but I think there is a tremendous resource in waste concrete, steel, and other items that are being buried in our landfills reducing the life expectancy of the landfill by 15 or 20%. I think this is something all counties need to look at. So, one of the reasons Florida hasn't gone with designed reefs, I think, is that the cost is pretty prohibitive. I think there is a lot of concrete and steel being put in the ground that we could put out in the waters to help from a economic standpoint. Joan, to your question, the Organized Fishermen in Citrus County Chapter is a very strong organization, and we have had some meetings in Citrus County and invited them. After the very first meeting, they said they were not interested in this, and I wanted them to be a part of that organization. I think your comments were very good, but I think the local county chapters have to get involved with the artificial reef programs instead of you or Jerry [Sansom] standing up and saying this is the way the association feels.

Tom Fraser: What I said was that I wanted to see the percentage [of designed reefs] change. I didn't necessarily say that that meant all new reefs had to be designed reefs. This state is growing very rapidly and there is no question that these reefs are magnets for fishermen to come to. I look at a bridge and see a "no fishing" sign. My gosh! There's got to be good fishing between those signs because nobody gets in there, and you try to sneak into those areas. I think it is human nature to do that sort of thing. It is going to be very difficult, but we have to recognize that some uses (of reefs) are going to be incompatible on the same reef. If we can get people to agree to that, and we can get the number of designed reefs up, I think that people in the fishery science area and technology area, would see differences that may be even better than putting that rubble out there on the bottom.

Hudson: I certainly agree with that. But the problem with Tallahassee is that they usually make these mandates on local governments, but don't send the funds to do it, and designed artificial reefs are more expensive.

Fraser: There is a commission in Florida that, unfortunately, has taken most of its testimony on trying to reorganize some of the environmental and natural resources regulations around the state, and this area is right for that kind of reorganization. I just don't believe that the permitting, as it is currently done, is directed to the proper issue, that being the biomass reefs are suppose to attract. All these other issues about whether it's on state land or some other land need to be addressed, but the principal point is the biomass that is coming to that reef. That is what everybody is really interested in.

Ed Kalakauskis: The Jacksonville Offshore Sportsfishing Club has been in the business of putting artificial reefs offshore for over 26 years. We constantly solicit ideas from the sports people and the commercial industry. We also solicit ideas from the government agencies who distribute funds. I hear people pointing fingers at people here today. As an all-volunteer organization, we ask organizations that point the finger, "Put some money into it instead of lip service."

Fraser: Hopefully Peter Dunbar and Dale Patchett will be a little more successful this year with their bill, where they do ask for that kind of state funding.

Malcolm Patterson: I'm from Northwest Florida, and I want you to know that suggestion is controversial also!

Fraser: I'm sure it is!

Panel III Discussion

Debating the Issues

Marion L. Clarke, Florida Sea Grant Extension Program, Moderator

Question 1: Should Florida Have a State Artificial Reef Plan?

Discussion Leader: Joe Halusky, Florida Sea Grant Extension Program

Participant Survey:	55	High Priority (82%)
	6	Low Priority (9%)
	0	No Priority (0%)
	6	No Response (9%)

Consensus: Yes, a plan for Florida's artificial reefs is needed; there was no dissension on this question. However, for a plan to work in Florida it is recommended by Groups 1 and 6 that it contain the following items.

Summary of Recommendations

1) A plan must reflect the diverse local habitats of Florida, as well as diverse local needs. Florida is not the same all around the state; no one policy will serve the wide difference in habitats statewide, e.g. South Florida with a narrow continental shelf vs. North Florida with a wide continental shelf. Local input must be included during the writing of the plan, as well as in updating the plan over time. A plan should not originate from Tallahassee alone.

2) A plan needs to have an equitable distribution of funds, resources, and materials throughout the state, based on user pressure on natural resources and user needs.

3) A plan needs to be long range in focus, but maintain local input to address changes in local needs, as well as differences between localities.

4) A plan should contain a review of past reef sites. Past sites need to be evaluated for successes and failures. For example, sites that failed need to be documented as to why they failed, e.g. type of materials, siting, substrate, etc.

5) Based on the above evaluation process, the plan should address reef site selection and construction criteria, and appropriate types of materials and designs for the various Florida offshore habitats. Design criteria for artificial reefs and reef materials should be flexible enough to encourage innovation in reef designs and/or materials.

6) A plan should contain guidelines, or procedures, for orderly building of artificial reefs. This should outline all the steps from initial public hearings and site planning to post-construction site monitoring and maintenance. This should not be a set of restrictions but a guide as to what can be done rather than what cannot. Restrictions should be included only when absolutely necessary.

7) A plan should include all water bodies, fresh and saltwater.

8) As for who should develop this plan, three options were discussed.

- Bring a group in from outside the state for a year or two to write the plan.
- Appoint an instate blue ribbon committee that would write a plan, or supervise its writing. Previous examples of this format include the Blue Ribbon Marina Committee and the Aquaculture Review Board.
- Utilize the state comprehensive planning structure, with the regional planning councils to coordinate planning efforts. This would provide local input to the

plan with the councils acting in liaison with the state lead agency for artificial reefs, in this case Florida Department of Natural Resources.

Discussion

Ron Lukens: It has been alluded to several times today that Florida not only has a very large coastline, but also has a lot of fragmented reef programs. I think it might be helpful to have the state plan be a little more general than have it address each individual locality, area, or situation that you might find, for instance, the Panhandle vs. the Miami area. The National Artificial Reef Plan, as some of you know, is a very general document and was not intended to address specific problems within the State of Florida, but was intended to provide guidelines where Florida could produce a state plan which was a little bit more specific. You might want to look at establishing a state plan and then look at regional plans, or even more site specific plans, that would address the needs of individual programs. For example, counties in the Panhandle could get together to develop an area or regional plan that would be more specific to their area needs than a state plan is going to get. I would be afraid that with all of the various needs and differences of the individual programs, the state plan would get muddled. That is my only comment, to develop a plan in a stepwise fashion, rather than have a state plan that would try to blanket everything.

Marion Clarke: I think that is a neat suggestion and basically what that would do is integrate the answer to Question 5 with the planning process questions, so that the organizational structure could also be implemented through the planning process.

Question 2: Should Florida Have a More Formal and Expanded Artificial Reef Program?

Discussion Leader: John Stevely, Florida Sea Grant Extension Program

Participant Survey:	48	High Priority (71.6%)
	10	Low Priority (14.9%)
	1	No Priority (1.5%)
	8	No Response (11.9%)

Consensus: Yes, there should be an expanded state role in the state's artificial reef program, and an expanded reef program is justified. However, any state program would depend upon the development of a comprehensive and well thought out plan prior to its inception.

The following is a list of advantages and disadvantages of an expanded state artificial reef program as discussed in Groups 2 and 7.

Advantages

1) Economy of scale and efficient use of resources: A larger program could reduce cost of siting, deployment, maintenance to smaller counties and reef programs; efficiency of reef building would be improved; for example, state barges would be available for transport, a state pool of expertise and materials could be assembled.

2) Liability: If the state held all permits, liability of smaller programs would be reduced.

3) Credibility: Florida appears to be helter-skelter in its reef development; a state program under a plan would help improve our credibility.

4) Cooperation: A state program could integrate state, local, and volunteer efforts to strengthen overall effectiveness of everyone.

Disadvantages

1) Local needs and input could be circumvented if a state program is improperly organized and administered. Certainly a statewide program would be weakened if integration of local concerns and needs did not occur.

2) State program may be more influenced by politics resulting in inequitable allocation of funds/resources.

3) State administrative costs would increase.

4) If nothing is organized at the state level, reef building will continue as it currently is.

Discussion

Mark Perry: I was in Group 2 and want to point out that one of the minuses that was indicated was the local input to that state program effort. I would like to make that a plus rather a minus. In other words, I feel that the local input is very essential and necessary to any kind of statewide program since that is where the initiative began many years ago and that is where the state should look for guidance to develop their guidelines and their regulations.

J. Stevely: That is what we meant. It would be a minus if you lost that local input.

Will Sheftall: I just wanted to present a couple of other ideas that came up in our group which were reported in John Stevely's synopsis. We felt the answer to Question 2 would be that Florida should have an expanded reef program, but the expanded program should consist of the state providing some planning guidance to the counties. That way we would have a local or regional plan developed at the request of the local government and the volunteer groups that already have something going on, that may be working well mechanically and logistically in a particular locale. They would receive planning assistance from the state to carry on their own program. That's sort of a variation on that "yes," Marion [Clarke], in that we felt the program should be a plan provided as guidance to the local community and the plan would address in a proactive sense where reefs could be sited according to traditional fishing grounds, the site characteristics, and the availability of certain materials. For instance, if you don't have oil rigs in your county then you wouldn't have to look at adequate water depth, where oil rigs could be located and that kind of thing.

Joe Halusky: The group that I was in was addressing Question 1, but the question evolved to how a statewide plan would be implemented. In my remarks earlier, I mentioned that we need to involve the regional planning councils. The regional planning councils, in many respects, already have data and information with respect to solving waste disposal problems, the oil rig problems, wetland problems, and things of that nature. They already have a model that has been implemented from the state level down to the regional level and now ultimately down to the county level in the comprehensive land use planning guide. The thinking was to incorporate people involved in the solid waste disposal agencies at the county, regional, and state levels in discussions of such a plan. As was mentioned earlier today, materials are available, if they are clean and nontoxic and have a biological function, in a sense that they can enhance and produce biomass. We obviously wouldn't want to dispose of materials that were toxic, or not biologically productive. But if you have materials that were acceptable, then they should be earmarked and used in such a plan, and the regional planning council body, as an agency, would be aware of those things and could provide a coordinating role between county, regional, and state levels.

Dewitt Myatt: I helped develop the New Jersey state artificial reef plan, and it was just completed about a year ago. I think one of the things people need to look at in developing a plan is standards, not guidelines. You need something firmer and stronger than guidelines. You need standards to follow. It is shameful the amount of reinvention of the wheel that has been going on in the reef business because people get these little wimpy guidelines to go by. You can't go by wimpy guidelines; you have got to have standards. If you know something moves when you put it out there, nobody should have to go through the agony of cleaning up the beach! So, we need to realize that if we're going to develop a plan, then go at it like we're going to try to accomplish something; not just a little "how to" guide for somebody. I was involved in the permitting aspects, and I feel that standards should have been set up in the plan and then enforced through permitting. Thank you.

Question 3: Are Changes Needed in the Present Artificial Reef Permitting System?

Discussion Leader: Max Puckett, Florida Sea Grant Extension Program

Participant Survey:	29	High Priority (43.3%)
	19	Low Priority (28.3%)
	4	No Priority (6%)
	15	No Response (22.4%)

Consensus: A state program and plan need to be in place to improve the permitting process. This was assumed by Groups 3 and 8 for the following recommendations to be effective.

Summary of Recommendations

1) Mandatory standards and procedures are needed such as:

- guidelines and criteria for biological surveys
- performance standards for materials
- placement procedures for post-construction maintenance and monitoring.

2) A central agency should review *all* permits whether in state or federal waters. Specific staff should be trained and assigned to process artificial reef permit applications, using the same guidelines for state and federal waters.

3) The notification process should be improved. A method to insure that all user groups are informed of reef permit applications should be established, e.g. commercial and recreational fishing organizations, environmental groups, etc.

4) Florida DNR should be the lead agency in this process, possibly through an advisory panel with user group, as well as state and federal agency, representation. Further decentralization of the permit process will only increase user group conflicts over the siting of artificial reefs.

- 5) Enforcement of existing (and future) permits should be improved. To accomplish this, Florida needs the following:
- better definition of requirements for maintenance and monitoring (both pre- and post-contruction)
- mandatory baseline site data, e.g. biological, historical use, geophysical (sediments)
- specific requirements for buoys or markings.

Discussion

Mark Perry: I think it is very important to bring out that when setting standards, performance standards or criteria for reef development, we need to utilize the knowledge that we already have gained from all the local experiences. The way to do this is to get both state and federal people together. The Corps of Engineers has

to work with the state people and get down to the local level to get all the background knowledge, before setting up the permitting standards, revising permitting procedures, and improving on the permitting. We should not continue to give a blanket permit, saying "Well, this is okay because it does not appear to be hurting anything." Let's find out if it's working, or if it's impacting some areas. Let's have the state and federal people work together to improve that situation.

Ron Lukens: The Recreational Fisheries Committee of our commission addressed this permitting issue and appointed a subcommittee to look at it and develop some standardized guidelines across U.S. Army Corps of Engineer districts, because they vary considerably from Texas all the way across to Florida. So, there is some effort through that committee that will begin in the near future to work up a document that will point out the differences that exist in those various permitting processes, and try to work with the various Corps districts to come to some agreement about standardized guidelines. I believe you [Florida residents] fall under two districts, and it could have some impact on what goes on in Florida. So that's an effort that we're going to be working on in the near future.

Bill Lindberg: A lot of comments have been made about how different regions or areas of the state are from others. Even within a region there is a considerable amount of patchiness in the natural habitat that exists offshore where there are potential reef sites. With regard to the permitting effort, the agencies only have what you provide them in your permit application to make an objective evaluation of site suitability. Site selection criteria probably should include some standard of sampling protocol, for example, the extent of sampling, if it's necessary, the nature of that sampling, etc., so that we can have some reasonable data on the patchiness of the environment that is about to receive a reef. Right now, there is virtually no guidance or standards set forth as to the extent of sampling necessary to support the reef application.

Max Puckett: That is basically what our group felt as well.

Question 4: Should Some Form of Monitoring, Maintenance, or Management Be Required for Each Reef Site or System?

Discussion Leader: Ben Mostkoff, Coordinator, Dade County Artificial Reef Program

Participant Survey:	48	High Priority (71.6%)
	11	Low Priority (16.4%)
	1	No Priority (1.5%)
	7	No Response (10.5%)

Consensus: Yes, there should be a monitoring, maintenance, and management system for artificial reefs in Florida. This should be made a part of the state artificial reef program (Groups 4 and 9).

Summary of Recommendations

Monitoring

1) Each reef-building program should be required to conduct biological monitoring on their reef sites. The incentive for this should come from a state plan, which should be approved by the Florida Marine Fisheries Commission and establishes a uniform set of guidelines for everyone to use.

2) The effect, and/or impacts, of artificial reefs need to be determined. This re-

quires biological assessments, sediment analysis, and other parameters to be studied prior to and following construction.

3) Monitoring should be made a requirement of all FDNR grants for reef construction, with concurrent changes in state funding legislation to allow grant dollars to be spent for reef monitoring.

4) Monitoring can be conducted by state, county, or city personnel, as well as SCUBA clubs that are trained to do this work.

5) Local monitoring would be important to defend or justify Special Management Zone requests through the South Atlantic Fishery Management Council (federal waters only).

Maintenance

A state plan should define the criteria for maintenance. This definition should include verifying that the materials remain in place (i.e. staying within a permitted site) over time, particularly after storm events. This would imply that reef building entities would be responsible for replacement or restoration of materials if moved off the site.

Management

Monitoring and maintenance are subunits of management. Both state and local agencies or entities should set management goals for their particular artificial reef program. If management goals are being infringed upon, measures should be taken or requested to implement these goals.

Discussion

Jim Jeansonne: This is one of the problems that has weighed heavily on my mind for the last year or so. I just started as an artificial reef coordinator, manager, and program developer for Hillsborough County. Before that, I dealt with the research aspects of artificial reefs. I am at a loss as to how to implement an ongoing monitoring program. Whatever monitoring requirements are developed need to be thought out very well. They need to be practical and something that local organizations can accomplish; but they also need to generate real data that the scientific community can use. Monitoring shouldn't be "that's nice, there are more fish now than there were before." We need statistically valid data. So the requirements, as far as I can see, need to be practical, not too expensive to implement, but also valid, so as to produce scientific data that can be used in the future.Once monitoring is established, it should continue. For example, the Hillsborough County Environmental Protection Commission has 15 solid years of monthly sampling on water quality data. It doesn't vary. It hasn't varied for 15 years. They have done the same tests (seiche disk readings, etc.) every month for 15 years. Once we establish a program, we might add some things, but we surely should not delete tests that have been going on for, say, five years. We should keep making those measurements.

Clarke: I think the monitoring process is probably a critical element to establishing the (permitting) standards. An example of that might be the artificial reef scientific dive team operating in Northeast Florida, which identified that a whole culvert put down on limestone, due to wave action, will gradually grind itself into the limestone and end up with zero profile. Something like that could go back into the standards.

Halusky: Correction on that. It was a steel gasoline storage tank!

Clarke: Okay, a steel gasoline tank ground its way into the limestone, with the tank acting up like a grinding wheel. So, that type of monitoring can help.

Kalakauskis: I challenge the scientific world to come up with a monitoring sys-

tem. We had a meeting several years ago, actually about five or six years ago, up in North Florida where we brought the scientific world together: Drs. Heyward Mathews, Steve Bortone, Jim Bohnsack, among others. We asked them for suggestions for our county where we've got a research team, trained by Sea Grant, to direct us as what to do. I don't think everyone could come up with a mutual agreement on what we needed to do.

Question 5: Is a Formal Network or Association Needed for Artificial Reef Interests?

Discussion Leader: Don Pybas, Florida Sea Grant Extension Program

Participant Survey:	42	High Priority (62.7%)
	15	Low Priority (22.4%)
	3	No Priority (4.5%)
	7	No Response (10.4%)

Consensus: Yes, a statewide association or network should be formed for artificial reef interests in Florida (Groups 5 and 10).

Summary of Recommendations

1) There should be a central organization made up of representatives of each region of Florida. The function of the central organization should be to link management agencies to the reef building programs and groups and to advise the state legislature on artificial reef policy.

2) Regional organization would include the following:

- representation from all coastal counties
- each county to have an advisory committee with representatives of all user groups, including sport and commercial fishermen
- a designated county representative to participate in the central organization.

3) The Florida Sea Grant College Program could provide the leadership for this organization having the following:

- an established network already in place
- an affiliation with the state university system
- county advisory committees around the state with user group representation, already in place in most areas of Florida through the Sea Grant extension agents.

Discussion

Jim Bohnsack: It wasn't clear to me how this was suppose to function. Was this organization to be advisory in nature, or was it supposed to pass information among different areas or even to influence state government, legislation, DER, DNR, etc? I'm not sure what the fuction was. Maybe you could go into that a little bit more.

Don Pybas: Well basically, it would act as an advisory group, but it also would have the backing of the Sea Grant research community and other agencies and universities which could feed information to this overall group, assisting the designated responsible state agency, whoever that is. When I spoke of Sea Grant getting involved with this, acting as the network coordinator, we didn't mean that on a full time basis. Basically, we could assist an organizational effort over a period of time, and eventually, as this organization takes shape, we would back off and act in an advisory capacity to that group. Does that answer your question?

Marion Clarke: To add a little bit on that, Don, the group I moderated felt that this would focus through one organization the fragmented issues that now exist around Florida, so that, when the fishery management council or DNR had a ques-

tion or needed information, there would be a liaison here that could communicate to the total network through one organization. This was one of the major advantages of it.

Pybas: I think that is one of the major problems we've had throughout the state. We've got a lot of activities around the state and many people are doing their thing over here but they don't know what is going on on the other side of the state or up the coast. DeWitt was talking about re-inventing the wheel earlier. There are a lot of people doing that out there in Florida. They are out there busting their chops to do something, and it's not working and somebody else had already tried that two years before. Now, on the other hand, there is some credit due to some of our programs for talking to each other informally, and finding information on their own, not only from here in Florida but also from people outside the state concerning other techniques, designs, etc. It's not like we are in a vacuum.

Skip Hudson: The second speaker brought up a very good point, indicating that we would need to have a plan before we have a program. Going over each of these questions today, it looks to me that what we need, first of all, in Florida is a commitment. Once we have a commitment on the local level and at the state level, we can work to come up with a plan and then a program for the state. At our table, I mentioned a little story about the miner who traveled all over the world looking for gold, and after he had mined for about 60 or 70 years he came back home, broke. One day he walked out the front door of his home and stumbled over the largest gold nugget ever found. I think we have that here in Florida. Representative Dunbar brought up some good issues at lunch. You know, we've got 30,000 people a month moving into Florida. If we could come up with a fee, maybe $7 or $8, to charge divers and fishermen, we could come up with a solution to some of these issues. Our county was lucky this year. We got a $20,000 grant. Ginny Vail's [DNR] total budget next year is about $135,000 with $100,000 going to the artificial reef program. But, if we had 3 million people in the state that we charged $7 or $8, we would have about $23 million; instead of building reefs out of just scrap material we collect in our counties, we could build some of the most scientifically created reefs and the best sportdiving and fishing in the United States of America. So, my philosophy in government is, if you use it, pay for it. But the free ride has got to end sometime in Florida, or we're going to go broke.

Clarke: We have discussed a lot of neat ideas that were brought up by all of you. I think they're very creative and can provide a potential foundation to the future which our next panel will address.

Planning for the Future: A South Atlantic/Regional Response

Michael H. Meier
Chairman, Artificial Reef Committee, Atlantic States Marine Fisheries Commission, and Virginia Marine Resources Commission, Newport News, Virginia

I WISH I had all the answers. I don't. I don't think any one of us does; but in hearing some of the things that have been brought up, I had a couple of things that I would like to offer from the experience I have gotten in the State of Virginia, with mistakes and with failures. In the conference today, as in the days that are coming, the mistakes and successes that have been made in the artificial reef community have been made exactly, as such, by the artificial reef community. Individual programs with a lot of good will and good intent have had some things go right, and so have the state programs. We both had our successes, and we both made our mistakes out there.

I am happy to see the overwhelming support for state plans. This is something that has recently come to the forefront, but should have done so a long time ago. Fortunately, in a sense, it didn't, because at least now we have a national reef plan that we can use as a model to meet our own needs for individual state plans. Two of the most important things in developing a state plan would be: 1) to come up with some real hard guidelines, not just suggested criteria; and 2) when developing your state plan, to solicit input from the appropriate government agencies and various interested parties. If you have a state reef program, you've got to obtain the proper permits. So, obviously, the permitting agencies should be involved in developing a plan. Don't overlook the fishermen, the end users. They should always be involved in developing reef plans, but sometimes they are overlooked and these are the people for whom we are building the reefs. Also, don't forget to include the scientific community in the planning (and management) process for valuable information on the ecological requirements of a productive reef community.

Plan for Monitoring

One other thing I would like to say concerning planning is that I think it is a good idea to include some kind of monitoring recommendation, or monitoring activities, in the plan. This may not be easy to develop. The ASMFC Artificial Reef Committee invited Jim Bohnsack, Frank Stimel, and Dave Feigenbaum to address their meeting in Annapolis, Maryland, last August. They presented their ideas on the issue of "aggregation vs. production." It's a complicated question that needs to be investigated. I think the fact that the committee asked these people to discuss this issue shows that the reef community, at least the state program managers who are actually building the reefs in most states, is receptive and listening and concerned about the possibility that artificial reefs may not create a productive community. A monitoring program to address the issue is not going to be easy to develop. States or municipalities need to develop a monitoring program tailored to their artificial reef conditions. They've also got to determine how they will fund the program, who is available to do the work and what qualifications are necessary to do it. It's not going to work if one monitoring schedule is developed for one area and then just duplicated in other counties or in other states because there are significant ecological differences between areas.

I think that, all in all, the atmosphere in the United States for artificial reef development is probably better now than it ever has been. The point was made here

a little while ago that we're not afraid to look back and learn by our mistakes. It's not a bad idea to go back and look at individual reef sites to see which ones are still functional and which are not. And, of the ones that are not functional, determine why they failed. For the ones that did work, determine why they were popular, why they were productive, why those materials maintained their position, their structural integrity, etc.

How It All Started

Reef building in this country, as previously mentioned, started primarily as a labor of love: sportfishermen and civic groups trying to get something accomplished, often without funding, often without good advice. This effort is something that has been kind of maligned. People look back in the past and don't want to remember what was done and don't realize those mistakes at the start put us where we are right now. For the first time, we do have a national artificial reef plan. Communication among reef developers is better than it's ever been before. Organizations like Sea Grant disseminate information. The Atlantic states reef program managers are getting together to discuss common concerns and compare efforts. Individuals interested in building reefs are getting together at the local and regional level. Here in Florida, for example, there may have been as many conferences as I think have been held in the entire rest of the United States, and that's a good thing to do. It's not a bad idea to look over the other guy's shoulder to see what he's doing. Reinventing the proverbial wheel has been a problem. It sounds logical that where you've got individuals and fishing clubs building reefs, they should be comparing notes, and that means state programs should be communicating too. In the past, major programs have reinvented the wheel because they didn't know that some other guy had found out that something didn't work very well.

And last, but perhaps not least, I think that once state plans have been developed, no matter what that effort might be, we've got to periodically go back and look at them. We have got to follow up. The National Artificial Reef Plan was intended to be a dynamic changing document, one that should be amended and updated as needs change, and as we find new information. The individual state plan or any local plan should also reflect that capability.

I thank you.

Planning for the Future: A Florida State Agency Response

Virginia Vail
Administrator, Artificial Reef Program, Florida Department of Natural Resources, Tallahassee, Florida

TODAY has been extremely interesting, and I am very pleased with what I have been hearing. Even though people are using different words, what I sense is that everybody wants about the same thing. They want some organization applied to what appears to be the chaos of artificial reef construction in the State of Florida. I'm very optimistic about what the future will bring artificial reef programs in Florida. I see that chaos yielding to organization. I see more communication and more coordination among reef builders. From what you all have been talking about, it's very clear that a state artificial reef plan providing standards for material, for site selection, and for monitoring is desired, and I see one coming. I don't see when, but I see one coming.

From the way it's being talked about, development of such a plan may be a "Catch 22" situation. Part of this group is saying we should have a formal state program after we have a state plan. In order to develop a state plan, I think we need the direction of a formal state program. Representative Dunbar has proposed such a formal program be established in the Department of Natural Resources (DNR) for the purpose of taking the first step in writing a State of Florida artificial reef plan. To me, development of such a plan would, by necessity, require the input and the assistance of all those interested in artificial reefs, including a variety of state agencies, a variety of federal agencies, local governments, fishing clubs, diving clubs, commercial fishing organizations. Everybody should be involved, because all the above parties are interested and everybody is active in reef development.

Uses for a Reef Plan/Program

What could a plan do other than provide standards? There are some options that are open. One, it could just be developed as a document for your reference. It could also be adopted more formally as the rule for the state program which would give it some strength. Regulatory agencies such as Department of Environmental Regulation or the U.S. Army Corps of Engineers (COE) hopefully would then take into account the standards of the state artificial reef program plan in applying or revising their regulatory criteria. In this way the plan would tie the regulatory agencies into artificial reef work.

The permitting needs and changes have been mentioned. Some of them will come upon development of a state plan. I see better coordination developing, hopefully, in the near future. I'm already in the process of trying to become involved in discussing COE permits for artificial reefs in federal waters. The COE is holding its annual meeting in Tallahassee in early January, and I have requested that this be one of the agenda items at their meeting. I would like to bring up some discussion there and get together with staff afterwards to figure out a process whereby DNR could tie into their permit review process. I am already involved in reviewing the DNR applications for using state sovereignty lands. They usually ask me to comment on the artificial reef applications before they respond. What we are seeing with the three regulatory agencies is that they are running on parallel but separate tracks. The application may be identical but the reviews are totally independent among all

three agencies. I would like to see them coordinate more in reviewing artificial reef proposals.

With reference to monitoring, I am delighted to hear there is a growing pressure for more monitoring, for assessments of what's going on both before and after reef materials are put down. But as Mike Meier has said, this is a tricky issue. What is monitoring? What is adequate monitoring? What is an adequate assessment? There are a lot of definitions that have to be developed before we can develop standards for monitoring. Also, what I have seen is that there are two different issues involved: 1) monitoring and assessments and 2) management and maintenance. The former is from the scientific standpoint where you need long term research studies. The latter pertains to the short term information needs of program managers. Perhaps as managers and as scientists we have to help each other break down our information needs into the proper questions. The question Is an artificial reef an aggregator or a producer?" is too broad to answer with one scientific study. It is a complex set of questions rather than a straightforward question. It's also possible, from the management standpoint, that information a reef manager needs could be obtained from a quick study to determine the status of his reef material. Did it stay around during that last storm? For this you would not need a long term study. So, also break down your information needs into categories for the amount of time needed, and resources that are available to get the answers. Don't think of it all as a long term scientific study.

Networking

On networking, I agree with what's been said. I think it is needed. I think we are off to a really good start with local, regional, and statewide meetings. I think Sea Grant has done an incredible job pulling everybody together, both personally and with their publications. I see that increasing as more and more people recognize the value of communication and more and more people are being allowed to travel to these meetings. We're working not only with individual managers but with their respective governments or clubs who help finance the bill for travel.

All of these things will come about, but, playing the devil's advocate for a second, they will come about only if you are willing to pay the price. There is going to be a cost. For example, revising the state artificial reef rule to accommodate monitoring studies or pre-reef construction assessments is going to cause a shift in the number of reefs that are being built. I am not now going to argue one way or the other on this issue. What I am saying is that things will have to change so you shouldn't be surprised when that change happens. It will be a change for the better in the long run, but there will be some short term readjustments to be made.

What we have been talking about here today is how we can make better artificial reefs, and everybody seems to be in agreement that this is needed. We need to get our act together. I am hearing a lot about other things that one can do with artificial reefs from people who are not artificial reef program managers. There seems to be a growing trend in a couple of areas to use artificial reefs to solve solid waste disposal problems. There is also some consideration being given to including artificial reef construction in mitigation activities. In some situations this could be appropriate, and in others, not appropriate. A state plan could provide guidance in recognizing the type of situation. In either case, artificial reefs cannot be considered as the sole answer to fisheries management problems. You can't trade your shoreline or inshore habitats for an offshore deep water artificial reef habitat. We need to keep that in mind. But, as I said at the beginning, I am very optimistic about what the next year, the next two or three years are going to bring for artificial reefs in Florida. I think we are going to go places, and we're going to be building very good, long lasting reefs.

Planning for the Future: A County Reef Program Response

Anthony Clemente
Director, Department of Environmental Resources Management, Dade County, Miami, Florida

IT IS ironic that Dade County's Artificial Reef Program which has been recognized as one of the best in the nation, has only one full time person assigned to it within the Department of Environmental Resources Management. It shows what one person can do with commitment and community support. The fact that government is coordinating this program rather than directing it has been a major factor in its success.

However, this program is threatened as the result of frustration by the private sector to have a voice in the management of the fishing on the artificial reefs they helped build. In addition, they are frustrated in the failure of government to properly manage a public resource. Historically, government has not managed public waters as actively as they have managed public lands. The private sectors' exploitation of fisheries in public waters needs to be managed not only on a national level but also on a local level.

Consequently, I think the key to the future of artificial reef programs is resolving user conflicts and providing consistent long term funding. Long term funding will only be available if the user conflicts are resolved to the satisfaction of the general public since they are the ones providing the funding. In Dade County's program, every user group except the commercial fishing group has provided donations of funds and services. If the fishery resources on these artificial reef sites are not protected from commercial fishing exploitation soon, we will lose the support of the general public to have a comprehensive artificial reef program in Dade County, or possibly the State of Florida.

Adequate Funding Needed

One of the reasons we have not had adequate monitoring programs and an adequate datebase, is that the funding has always been very limited and not something to be counted on year after year. Thus, it's very important that we establish continuous funding sources that can be relied on for monitoring, to build the datebase and to do some planning. It does not do any good to do long term planning if there is not going to be any money next year to implement the plan. On the other hand, if we do not have the public involved in the decision-making process, as far as where reefs are built, how they get built, and how they get used, the public is not going to support the program. When you do not have public support, you lose public involvement, which right now is the key element in the success of our artificial reef program. I think the fact that the people living in this area are having reef user group decisions made by people not from this state is very important. They are finding that the criteria being used to make those decisions are being changed without public notice and local input. This is going to create more and more frustration, leading to the point where they will not support continuous funding of our artificial reef projects. Without that, we are not going to have the optimum type of program which you heard about today.

Planning for the Future: A Volunteer Reef Builder Response

Ed Kalakauskis
Chairman, Artificial Reef Committee, Jacksonville Offshore Fishing Club, Jacksonville, Florida

FIRST of all, I'm not really a speaker, I'm a volunteer worker. Bill Donaldson of Martin County has been doing this, sitting in these meetings, for 16 years. In Duval County, prior to me, we had a man, Lennon Hestin, involved in artificial reefs for 25 years. I really take my hat off to people like Bill Donaldson and Lennon Hestin. Will you be here 16 years from now, unpaid? That is where we come from; we don't get paid for this. We are the volunteers. We come to meetings like this, but we have to use vacation days to do so and pay our own way.

The biggest thing that volunteers run into is the "burnout syndrome." Years of sitting in meetings and years of working on projects, and I challenge the people that are in volunteer organizations, such as mine, to pass the ball on to other people. Without telling people what you are doing and explaining the program that you have, it's not going to be a volunteer program. So this is a challenge to volunteer programs. The volunteers have to get committed. We have people in adjacent counties that say they can't get involved because they haven't got the time. Well, I look at it this way, if the volunteers don't get involved and don't make a commitment to the future, they will be left by the wayside.

As volunteers, we build opportunistic reefs or, as we call them, freebies. As volunteers, we've got to look at material that people may discard as being viable reef project material. However, we also cannot eliminate the possibilities of doing further studies. Just because we are volunteers, and we work on getting materials free and getting them towed out to the site for free, doesn't mean we can overlook these reefs as future monitoring projects. Monitoring has been a key function of our volunteer program.

We have people from the Jacksonville Scubanauts that came down to this reef meeting. I would like to take a minute right now and have those from North Florida involved with the reef research divers and the Jacksonville Offshore Fishing Club stand up, just to give you an idea of our commitment in that part of Florida. These are the people who are volunteers. They have come all the way down here to get involved in this meeting with the Sea Grant Program. You've got to have commitment, and that's it. If you don't have commitment and don't pass on this information and don't make a commitment to the people who are going to succeed you, you're not going to have an organization, and you're not going to have a future. This commitment's got to be made and volunteers need to be inventive to have funding for their projects. You have to plead, beg, borrow, steal, whatever it may be!

Finally, I also challenge all the volunteers to take a serious look at their reef projects and utilize them as a management tool. In Duval County, we've taken a really serious look at our projects. We've gone from scraping up materials to mapping them to actual siting and placements. We're really looking at this from a long term perspective. When we place our reefs offshore from Jacksonville, we consider fishing pressure. Volunteer organizations should consider fishing pressure, and how it can be determined. Get people to do surveys. Get your academic community involved. You get Sea Grant involved. Teach your divers to go out there with slates and transect lines instead of spearguns and shotguns!

Panel IV Discussion:

Planning for the Future

James C. Cato, Florida Sea Grant College Program, Moderator

Gary Serviss: I have just one question, where do we go from here? What do we have to do to push this with the state? How do we get the ball rolling?

Jim Cato: Several things can be done. One is to decide what the state legislature can provide in terms of mandating certain activities and then ask their assistance. Representative Dunbar has some very specific ideas about the role he can play due to his interest in artificial reefs. Second, I think that some of the recommendations that come from this meeting will certainly be making their way through various legislative committees in the coming months and perhaps be implemented.

Anthony Clemente: I think one of the key issues facing the legislature next year will be the saltwater fishing license, which you heard about during lunch time. How that money gets spent is debatable. The fact that it is needed and should be targeted only for resource management and enhancement is something you also need to support.

Virginia Vail: Let your local legislators know what it is you want them to support. What is it you are looking for? That's your best direction. Get the citizens involved too, the power of the letter is incredible.

Jim Jeansonne: I have one suggestion. The people that are sitting here in this conference are an organization, but unfortunately we don't have a formal organization. Call it the Florida Artificial Reef Association, for example, or something similar. I would just recommend that some group get together and start this organization and be one of the states involved in a national artificial reef association which would be part of an international artificial reef association. I am paid to be an artificial reef coordinator, and I did so on purpose because I didn't want to have to be a volunteer. Ed Kalakauskis has put in 15 years and other volunteers have put in many years. I would prefer to do it professionally on my own behalf to help coordinate the activities of the county, but I think a state artificial reef association could be instrumental in helping to form the plan and program, not as a substitute for the state's artificial reef program.

Ed Kalakauskis: In Northeast Florida, we've just had a meeting where we gathered several counties together to discuss this same issue: a master plan. We haven't really defined our organization as the Northeast Florida Reef Council, but we are taking steps in that direction. We are pulling in people from Brevard through Nassau Counties and moving toward an organization.

Jeansonne: I would also like to say that on the west coast of Florida, a number of people have also expressed an interest in having regional meetings and a regional organization. I think we already have the seeds of a Florida Artificial Reef Association. I think it needs to be formalized. Now is an outstanding time to do it, as this reef plan is being prepared.

Cato: This is an area where the Sea Grant Program could provide assistance. Sea Grant could help get a county level representative meeting organized to form an association. It would then need to become self-supporting.

DeWitt Myatt: I managed South Carolina's artificial reef program for 12 years

before coming down here. Having attended several different county and private artificial reef meetings in Florida, I have gotten the feeling that you guys are your own worst enemy. I think that maybe some of Florida's artificial reefs are overcommittee'd. You spend an awful lot of time fighting among yourselves at monthly committee meetings and gatherings like this trying to resolve problems that members of the committee aren't experienced enough to solve. This creates a lot of obstacles to achieving your goals, maybe because of too much involvement with the small details. I think that, perhaps, the dictatorship of a state artificial reef program, like those that exist and seem to be working very effectively in other Atlantic Coast states, might be better equipped to take care of the day-to-day routine paperwork, acquisition of materials, issuance of contracts, and so forth, to get the materials put out and take care of the monitoring. Let the committees, because most of these committees are user groups, focus on the objectives and then find some bureaucrat to do what they want done rather than getting involved in such petty details as, "should we pay this guy $10,000 extra just because he doesn't realize that he was going to bang up his barge up on the job." So, this is my comment. I think that, in a way, what I have seen is very very cumbersome, and possibly it might be better handled in an executive manner.

Cato: Hopefully, this meeting will help solve some of those problems in developing a state policy. We appreciate your comments.

Closing Remarks

Scott Andree, Florida Sea Grant Extension Program

OBVIOUSLY, we couldn't do it all today, and I believe you realize by now how big a job we have here in Florida. What we need to achieve in the future is not going to be an easy task. Someone mentioned to me earlier today that it would have taken three days to cover all the things we tried to cover today in one, and I would have to agree with him. However, we did have to start somewhere, and I really feel that, all in all, we had a very productive day. I appreciate all of you that participated, our speakers, those of you that volunteered. Many of you spent your own money to come here, including several of our speakers. This exemplifies the kind of commitment to artificial reef development that we have here in Florida which makes us unique.

I have a few summary comments to make as to where I see us going from here, both on an immediate basis, as well as a long term direction. First of all, there will be a proceedings of this meeting, which we will attempt to produce in a couple of months. With the legislative committee meetings starting in February, the recommendations presented today will be synthesized into a summary format to assist their deliberations. In that vein, we all can make a difference. It was brought out that everyone needs to contact their legislators in the State Senate and House to support, or provide input on, the bills being filed, particularly House Bill 16 filed by Rep. Dunbar, mentioned in his keynote address.

Second, more frequent meetings appear to be preferred. The survey conducted at the beginning of this meeting queried how often you would like to meet, either at a state level or regional level. Although the frequency may vary from region to region, the overall response was that a statewide meeting, at least, should be held more often than every eight years, the last being in 1979. Florida Sea Grant has organized several of these state meetings in the past, and over the past eight years has been sponsoring meetings on the local and regional level, in addition to giving more attention to some of the research priorities identified in the earlier meetings. We are now re-establishing a program-wide effort to transfer this information to the reef-building community, particularly to assist local and regional reef planning efforts. It has become clear that a statewide artificial reef plan has been mandated by this summit and subsequent meetings could assist that effort and insure ample opportunity for everyone's input into that plan.

My final point is that we need to begin the process of networking. It has been mentioned that Sea Grant, at the university level, should be the leader, or at least a catalyst, to begin this process. A good place to start would be through a statewide newsletter which Lin Welch, now our editorial specialist at Sea Grant, or some other reef association, could help develop. This newsletter could be very similar to what Steve Phillips is doing with the *ARDC Reef Briefs*, that keeps us informed of artificial reef programs nationally. The other idea, mentioned on the floor just a few minutes ago, was to assemble a state organization steering committee. This would seem to be a necessary first step to developing a statewide association or network. It is possible that the Florida Sea Grant organization could assist in pulling such a committee together, if not in the next few months, within the year.

With that said, I would like to officially close the meeting and invite everyone to a sponsored reception to continue informal discussions and get to know other fellow reef builders. For those of you that are staying for the International meeting, have a good week. Thank you for coming. I enjoyed it, and I wish everyone a safe journey home.

Appendix A
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Appendix B
Florida Artificial Reef Summit

November 2, 1987

Program

8:30 a.m.	Welcome and Introductory Comments *Scott Andree, Florida Sea Grant Extension Program*
8:40	Global and National Status of Artificial Reefs *Bill Seaman, Florida Sea Grant College*
8:50	Overview and Trends in Artificial Reef Development in Florida *Don Pybas, Florida Sea Grant Extension Program*
9:00	**Panel I: Changes and Challenges: New and Revised Agencies Policies and Programs** *Moderator: Ron Schmied, National Marine Fisheries Service*
	National Fishing Enhancement Act: New Federal Directions *Ron Schmied, NMFS*
	Federal Artificial Reef Permitting Requirements *John Adams, U.S. Corp. of Engineers* *Lt. Commander P.R. Von Protz, U.S. Coast Guard*
	Florida Artificial Reef Permitting Requirements *Larry O'Donnell, DER, Div. of Permitting* *Casey Fitzgerald, DNR, Div. of State Lands*
	Applications for Special Management Zones *Gregg Waugh, South Atlantic Fishery Management Council*
10:30-11:00	Break
11:00	**Panel II: Reef Resource User Viewpoints on Responsible Development** *Moderator: Joe Halusky, Florida Sea Grant Extension Program*
	A Commercial Fisherman's Perspective *Joan Butler, Organized Fishermen of Florida*
	A Sport Diver's Perspective *Dan Grizzard, Associated Marine Institutes*
	A Sport Fisherman's Perspective *Ted Forsgren, Florida Conservation Association*
	A Research Perspective *Jim Bohnsack, National Marine Fisheries Service*
	A Resource Management Perspective *Tom Fraser, FL Marine Fisheries Commission*
12:15 p.m.	Luncheon Keynote Address: Artificial Reefs' Future *Rep. Peter Dunbar, FL House of Representatives, Dist. 50*
1:30-1:45	Break (Tables will be cleared, participants will return to their tables after the break)

1:45-2:30 **Debating the Issues:** Small discussion groups (8-10 persons) will formulate recommendations to the following questions (one question per group).
Moderator: Scott Andree

1. Is there a need for a state artificial reef plan? How can we develop a plan to deal with different habitats, shelf size, diversity of environments. If so, who should develop the plan, and what role should the plan serve in future reef development (e.g. general guidance, specific performance standards for the state permit approval, or actual identification of suitable reef development sites)?

2. Should Florida have a more formal and expanded state reef program? If so, what functions should the state, local government, volunteers perform? For example, should the state hold all permits and be directly involved in reef construction as is done in some states?

3. What improvements or changes are needed in state and federal artificial reef permitting procedures and requirements?

4. Should some form of monitoring, maintenance, and management be required for each reef site or system? If so, provide some examples of what should be required and how can it be accomplished.

5. Is a formal network, or association, needed for reef building interests in Florida? If so, how should it be organized? Who should provide leadership: government, universities, private enterprise?

2:30-3:00 Break (Discussion group chairmen will meet to formulate summaries.)

3:00-4:00 **Panel III: Recommendations for Action**
Moderator: Marion Clarke, Sea Grant Extension Program
Group Chairmen present recommendations for each question. Audience participates in ensuing discussion.

4:00-5:00 **Panel IV: Planning for the Future: What is Possible?**
Moderator: James Cato, FL Sea Grant College

A South Atlantic/Regional Response
Mike Meier, Atlantic States MFC Artificial Reef Committee

A Florida State Agency Response
Virginia Vail, Florida Department of Natural Resources

A County Reef Program Reponse
Anthony Clemente, Dade County Department of Environmental Regulation & Management

A Volunteer Reef Builder Response
Ed Kalakauskis, Jacksonville Offshore Fishing Club

5:00-5:15 Wrap-up and Adjournment

5:30-6:30 Reception (sponsored)