

**ACTION PLAN**

**ECOSYSTEM-BASED MANAGEMENT:**

**EVOLUTION FROM THE HABITAT PLAN TO A  
FISHERY ECOSYSTEM PLAN**

**AUGUST 2004**

**“There is only so much carbon out there -- you need to decide what you want it in!” (Source: Dr. Ernie Carl, former Council member from North Carolina)**

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## **SECTION 1. HABITAT CONSERVATION AND PROACTIVE FISHERIES MANAGEMENT – THE FOUNDATION OF ECOSYSTEM-BASED MANAGEMENT**

From deepwater canyons off the Carolinas to the shallow tropical waters surrounding the Florida Keys, marine habitats found in the South Atlantic region are as diverse as the species that inhabit them. The South Atlantic Council is at the forefront of habitat conservation and risk-averse management through three broad actions:

1. Adoption of a proactive approach to **protect and enhance Essential Fish Habitat** (EFH) for all managed species under its jurisdiction.
2. Adoption of **precautionary and proactive management plans**.
3. Pioneering application of an **ecosystem-based approach** to fisheries management in the South Atlantic region.

Ultimately, by broadening the scope of management, the Council will achieve long-term sustainability of fisheries and of the ecosystem as a whole.

### **A. HABITAT CONSERVATION**

The Council regulates fisheries to protect habitat from direct and/or indirect impacts of fishing through the following regulations:

#### **1. Snapper/Grouper FMP**

- prohibits use of bottom longlines inside of 50 fathoms or anywhere south of St. Lucie Inlet, Florida;
- prohibits use of fish traps;
- prohibits use of bottom tending (roller-rig) trawls on live bottom habitat;
- prohibits use of entanglement nets;
- establishment of an Experimental Closed Area within the *Oculina* HAPC where the harvest and retention of all snapper/grouper species is prohibited; and
- establishment of Special Management Zones (SMZs) which limit use of highly efficient and potentially habitat damaging gear.

#### **2. Shrimp FMP**

- prohibits rock shrimp trawling in the *Oculina* HAPC; and
- requires Vessel Monitoring Systems (VMS) on vessels participating in the rock shrimp fishery off Florida and Georgia.

#### **3. Coral, Coral Reef and Live/Hardbottom Habitat FMP**

- prohibits all harvest or possession of these resources which serve as essential fish habitat to many managed species with the exception of the limited harvest of soft coral by permit; and
- establishment and expansion of the *Oculina* Bank Habitat Area of Particular Concern (HAPC). All bottom tending gear (including trawls) prohibited.

#### **4. EFH and EFH-HAPC Designations Translated to Cooperative Habitat Policy Development and Protection**

In addition to implementing regulations outlined above, the Council actively comments on non-fishing projects or policies that may impact fish habitat. The Council adopted a habitat policy and procedure document that established a four-state Habitat Advisory Panel and adopted a comment and policy development process. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. Advisory Panel members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on:

1. Energy exploration, development and transportation;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation; and
4. Alterations to riverine, estuarine and nearshore flows.

The NMFS, State and other Federal agencies apply EFH and EFH-HAPC designations and protection policies in the day-to-day permit review process.

#### **5. A Habitat Benchmark – the South Atlantic Council's Habitat Plan**

In 1998, the South Atlantic Council developed its Habitat Plan and Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans for the South Atlantic Region. The EFH Plan and Comprehensive Amendment were the first in the nation to be approved by the Secretary of Commerce and not challenged in court and overturned. This plan serves as a source document, consolidating the best available information on habitat essential to species managed in the South Atlantic, from the headwaters of river systems to off the continental shelf. The Habitat Plan was prepared through a cooperative effort of State, Federal and regional habitat partners on the Council's Habitat and Coral Advisory Panels.

#### **6. *Sargassum* Fishery Management Plan**

The *Sargassum* FMP is another effort undertaken by the Council to provide long-term protection to pelagic fish habitat. Approved in 2003, the management plan protects *Sargassum*, a free-floating seaweed found throughout the blue waters of the South Atlantic from extensive commercial harvest. *Sargassum* provides habitat to a wide variety of marine organisms including invertebrates, fish, sea turtles and marine birds. The seaweed is familiar to offshore fishermen who look for "weed lines" or mats of floating *Sargassum* where ocean currents meet and fish such as dolphin, wahoo, billfish and other pelagic species often gather to look for food and take shelter in the open ocean.

#### **7. *Oculina* Coral HAPC - Protecting Rare and Fragile Habitat**

In 1984, the Council established the 92-square-mile *Oculina* Bank Habitat Area of Particular Concern (HAPC) through implementation of the Coral and Coral Reefs Fishery Management Plan in order to protect the fragile coral. Within the *Oculina* Bank HAPC use of bottom-tending fishing gear including bottom trawls, bottom longlines, dredges, fish traps and fish pots was prohibited. Subsequent amendments to the Snapper/Grouper, Coral and Coral Reefs and Shrimp FMPs provided further protection to the *Oculina* HAPC through prohibitions on anchoring of fishing vessels, trawling for rock shrimp and

by requiring the use of vessel monitoring systems (VMS) in the rock shrimp fishery. Expanded in 2000, the HAPC now encompasses 300-square-miles.

## **B. PRECAUTIONARY MANAGEMENT PLANS**

**1. *Sargassum* Fishery Management Plan** - *Sargassum* is a free-floating seaweed found offshore in mats throughout the South Atlantic region. These mats of vegetation provide crucial habitat for a wide variety of marine animals in the open ocean, including economically important pelagic species such as tuna, dolphin, wahoo and billfish as well as sea turtles and marine birds. The Fishery Management Plan for Pelagic *Sargassum* Habitat in the South Atlantic Region was approved in 2003 and implemented strict restrictions on commercial harvest of this important fish habitat. A North Carolina company had been harvesting *Sargassum* for use in the feed supplement industry. The approved plan includes strong limitations on future commercial harvest. Restrictions include a prohibition of harvest south of the NC/SC state boundary, a total allowable catch (TAC) of 5,000 pounds wet weight per year, a limit on harvest to November through June to protect turtles, a requirement for observers onboard any vessel harvesting *Sargassum*, a prohibition on harvest within 100 miles of shore, and gear specifications.

**2. Dolphin/Wahoo Fishery Management Plan** - While not overfished, the Council has adopted a precautionary and risk-averse approach to management for this fishery. The South Atlantic Council, in cooperation with the Mid-Atlantic and New England Councils, developed a Dolphin/Wahoo Fishery Management Plan for the Atlantic. Recognizing the significant importance of the dolphin/wahoo fishery to the recreational fishing community in the Atlantic, the goal of the plan is to maintain the current harvest levels of dolphin and ensure that no new fisheries develop. With the potential for effort shifts in the historical commercial longline fisheries for sharks, tunas, and swordfish, these shifts or expansions into near-shore coastal waters to target dolphin could compromise the historical (1994-1997) and current allocation of the dolphin resource between recreational and commercial fishermen. The Dolphin/Wahoo FMP was partially approved on December 23, 2003. The final rule was published on May 27, 2004 and regulations are phased in on June 28<sup>th</sup>, September 24<sup>th</sup> and November 23<sup>rd</sup> 2004.

**3. Golden Crab Fishery Management Plan** - When the Council prohibited fish traps in the snapper grouper fishery in 1992, a few of the displaced trap fishermen began developing a specialized fishery for golden crabs. Harvesting of this little known species required fortitude and ingenuity in developing gear modifications to trap the deepwater crabs. The Nielsen family of Dania, Florida was instrumental in developing harvesting techniques, creating a market for golden crab and encouraging other fishermen to join the fishery. As the fishery began to grow, these same fishermen, who had been displaced earlier by the Council from their snapper grouper trap fishery, showed a remarkable good faith effort by approaching the Council with their own plan proposal for the golden crab fishery. This plan included measures to protect the stock, as well as a limited entry program to protect them from large vessels entering the fishery from outside the area. The Council worked cooperatively with the fishermen to provide a sustainable fishery by developing a management plan that would eventually limit the number of fishermen in

established fishing zones (southern, middle and northern) as well as implement the protective measures for the crabs as outlined by the fishermen themselves. Management has been so effective that the Council is in the process of adding more vessels to the northern zone. The Golden Crab Fishery Management Plan represents an excellent example of co-management between fishermen and the Council.

**4. Coral, Coral Reef and Live Hard bottom Habitat Fishery Management Plan** - The Coral, Coral Reef and Live/Hardbottom Habitat Plan prohibits harvest of stony corals, seafans, coral reefs and live rock (living marine organisms attached to a hard substrate) except as authorized for scientific and educational purposes. The harvest of allowable octocorals for the aquarium trade is limited in number and only allowed south of Cape Canaveral, Florida. In addition, Coral Habitat Areas of Particular Concern (HAPC), the *Oculina* Bank and Satellite Coral HAPCs have been designated in the South Atlantic. Within those areas, habitat damaging fishing gear is prohibited including bottom tending trawl gear, traps, dredges and bottom longlines. Anchoring or the use of grapples is also prohibited for all fishing vessels.

**5. Live Rock Aquaculture Program in the Coral FMP** - Aquaculturists in the marine aquarium trade have greatly benefited from a unique permit program created by the Council in 1995. This system allows permitted aquaculturists to put geologically distinguishable rock in their permit site. The rock can later be harvested with any growth, including prohibited hard corals and octocorals as long as they are attached to the cultured rock.

### **C. ECOSYSTEM-BASED MANAGEMENT**

With the Habitat Plan as a cornerstone, the Council is developing an ecosystem-based approach to resource management. Evolution of the Habitat Plan into a Fishery Ecosystem Plan (FEP), and transition from single species management to ecosystem-based management, will require a greater understanding of the South Atlantic Bight ecosystem and the complex relationships among humans, marine life and essential fish habitat. This effort will provide a more comprehensive understanding of the biological, social and economic impacts of management

#### **1. Technical Workshops (2003)**

A series of 15 workshops were held during 2003 to integrate and update habitat information and begin development of the South Atlantic Fishery Ecosystem Plan (FEP). These workshops brought together Habitat and Coral Advisory Panel members and a core group of resource and habitat experts from cooperating federal, state and academic institutions as well as conservation organizations that participated directly in development of the Habitat Plan.

The Habitat Plan will serve as the basis for the FEP. Updated life history and stock status information on managed species and the characteristics of the food web they exist within will be incorporated as well as social and economic research needed to fully address ecosystem-based management. Writing Teams (composed of AP members, experts from state and federal agencies, universities and Council staff) will review, update and expand

existing chapters of the Habitat Plan and incorporate this material into new chapters for the FEP (e.g., Ecosystem Modeling and Research Needs to support Ecosystem-Based Management).

Information compiled during and as follow-up to the workshops is helping the Council meet the EFH mandate to update EFH and EFH-HAPC information and designations. Also, this process would follow both the Council of Environmental Quality's and NOAA's recommendations (in 46 FR 18026/51 FR 15618 and NOAA Order 216-6 respectively) to review any EIS or SEIS that is more than five years old to determine if the preparation of a new EIS or SEIS is warranted. The FEP will be used to develop a Comprehensive Amendment/EIS for all Fishery Management Plans (FMPs) similar to the Habitat Plan and Comprehensive Habitat Amendment completed in 1998.

Workshops were conducted on habitat types including wetlands, oyster/shell habitat, seagrass, pelagic habitat (including *Sargassum* and the water column), coral and live/hard bottom and artificial reefs. In addition, workshops on the use of GIS to support EFH and ecosystem-based management and water issues affecting fishery habitat and production were held.

## **2. Technical Workshops (2004/2005)**

Workshops to expand efforts initiated during the habitat and issue-based workshops will be held during 2004 and 2005 on topics such as artificial reefs, deepwater habitat/coral, marine zoning and impacts of fishing on habitat. In addition, it is anticipated that a regional workshop to identify research and monitoring needs to support ecosystem-based management and further development of the FEP in the South Atlantic region will be held in 2004 and 2005. Internationally recognized experts in ecosystem characterization would be invited to participate and provide guidance to managers and researchers in determining the most significant needs to be addressed in development of ecosystem-based management.

## **3. Workshop to Refine South Atlantic Bight Ecopath Model (2004)**

A preliminary South Atlantic Bight Ecopath model was developed cooperatively between Dr. Tom Okey (University of British Columbia) and Roger Pugliese (SAFMC staff) as part of the Sea Around Us project funded through the PEW Charitable Trust Foundation. This model will be refined with the aid of a broad range of experts and involve: (1) scoping and system definition, (2) parameter estimations and refinement and (3) "mass balancing". The Ecopath model developed will help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the model will aid in identifying research necessary to better define populations, fisheries and their interrelationships. The two workshops held in 2003 to refine the Ecopath/Ecosim model have resulted in development of a list of functional groups constituting the South Atlantic Bight (SAB) ecosystem and preliminary designation of the areal extent of habitats to be included in the model. Experts in various aspects of the ecology of the SAB have been requested to participate in the process by providing various input parameters for the model.

The model is being developed to cover the area between Cape Hatteras, North Carolina through the Florida Keys and extend from the upper wetlands to the 300-meter isobath.

Catch data from 1995 to 2002 will be included. Currently, the model is being constructed to include 93 biotic groups. The Council is investigating the possibility of expanding and refining the South Atlantic Ecopath Model with development of embedded sub-models for the *Oculina* Bank HAPC, The Florida Keys, Deepwater Snapper Grouper Habitat and Albemarle-Pamlico Sound.

#### **4. Cooperative Research to Support Ecosystem-Based Management**

##### *High Resolution Maps of Habitat on the South Atlantic Continental Shelf*

The Council has partnered with the National Undersea Research Center at the University of North Carolina at Wilmington (NURC/UNCW) by providing seed money to begin multi-beam sonar mapping of the outer continental shelf and upper continental slope. This region of the Exclusive Economic Zone (EEZ) from just north of Cape Hatteras (North Carolina) to Cape Canaveral (Florida), covering a depth range of 100-500 m, includes important habitat for current and future economically valuable species (e.g., groupers, wreckfish, crabs, tilefish, etc.). Habitats used by these species include soft bottoms of various types and a wide range of hard bottom lithotypes. This area includes important and unique features such as “The Point” canyon system (just north of Cape Hatteras, North Carolina) and the “Charleston Bump” (off of Cape Romain, South Carolina). The features of these two EFH-HAPCs result in significant oceanographic effects in the region (e.g., upwellings) and also represent productive fishery areas. Throughout the region, and toward the deeper end (350-450 m), are scattered but extensive deep reef systems composed of delicate, slow growing ahermatypic corals (e.g., *Lophelia*). All of these habitats are poorly mapped. In addition, the Council is considering deepwater MPAs that fall in the same depth range. High-resolution (1-2 m) bathymetry maps are required for these areas.

The NURP Autonomous Underwater Vehicle (AUV) will be operated by NURC/UNCW. The unit will be maintained and operated by NURC/UNCW and be used in the initial testing by mapping deepwater coral and associated habitats in the South Atlantic.

##### *Regional Internet Map Server for Coral and Live/Hard Bottom Habitat and South Atlantic Habitat/Ecosystem Web Site*

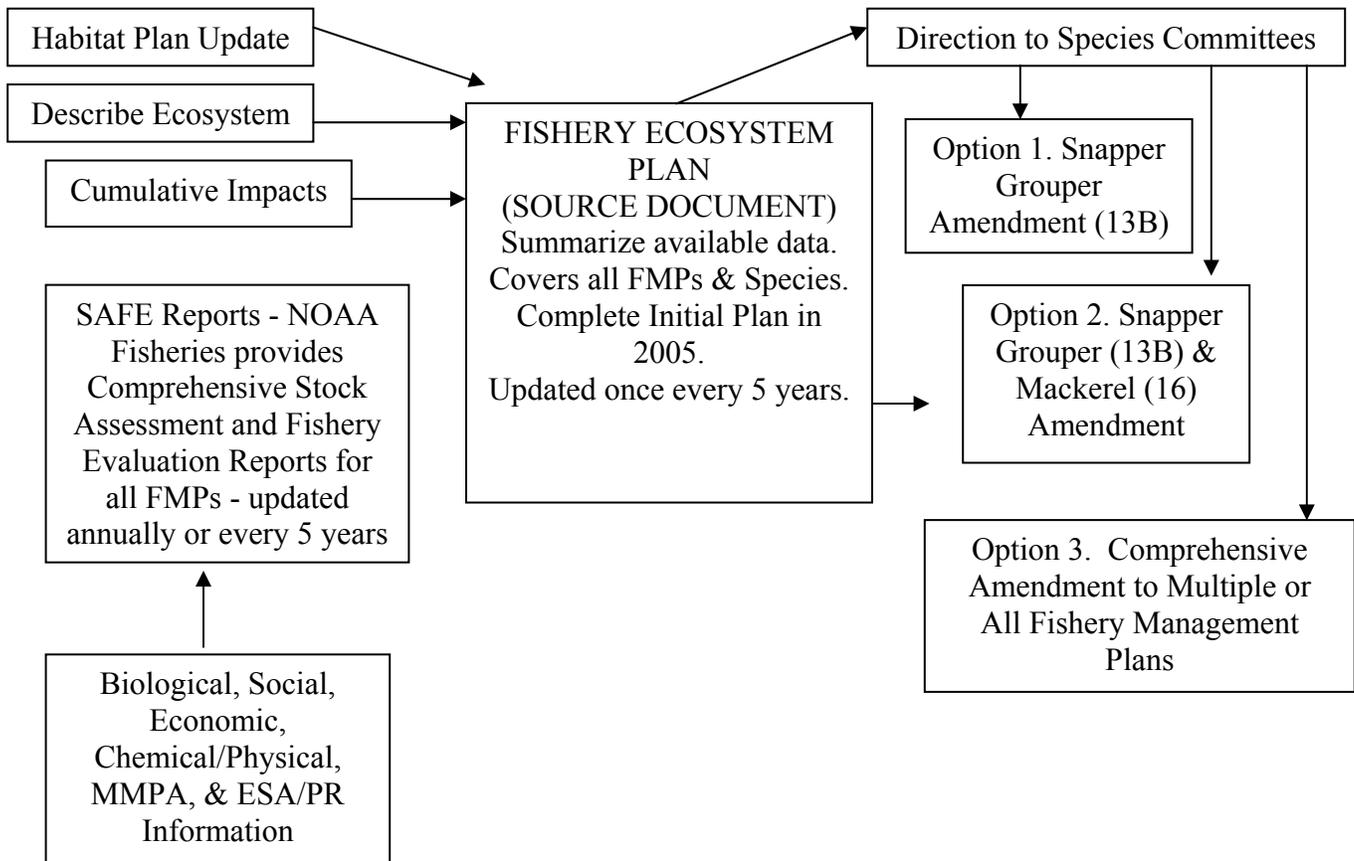
The South Atlantic Council and the Florida Marine Research Institute (FMRI) are partnering to develop an Essential Fish Habitat/Ecosystem web site that will be accessible from the South Atlantic Council’s web site. FMRI will host an Internet Map Server (IMS) application with links to bottom type data that can be downloaded, associated metadata, substantial program information for the Council and links to related sites. The Web site will be operated and maintained at FMRI in partnership with the South Atlantic Council.

The Internet Map Server (IMS) component of this project will bring the power of Geographic Information Systems (GIS) technology and Image Analysis tools to ordinary Internet browsers. The Coral and Benthic Habitats IMS will be an effective tool for displaying, sharing and querying information related to hard bottom and EFH across the South Atlantic coast. The video and still imagery archives served from this site will provide researchers a unique opportunity to monitor coral health and abundance.

This partnership involves two project phases: (1) configuring of hardware, software and GIS data for serving via the Internet; and (2) inclusion of video and imagery processing, web site development and maintenance of products and services developed in Phase 1. Additional funding is needed to maintain the system and provide a mirror ArcIMS Intranet system which will further integrate baseline information (e.g., habitat, catch, community, fishery operations and economics) to support ecosystem-based management and the FMP/EIS development process.

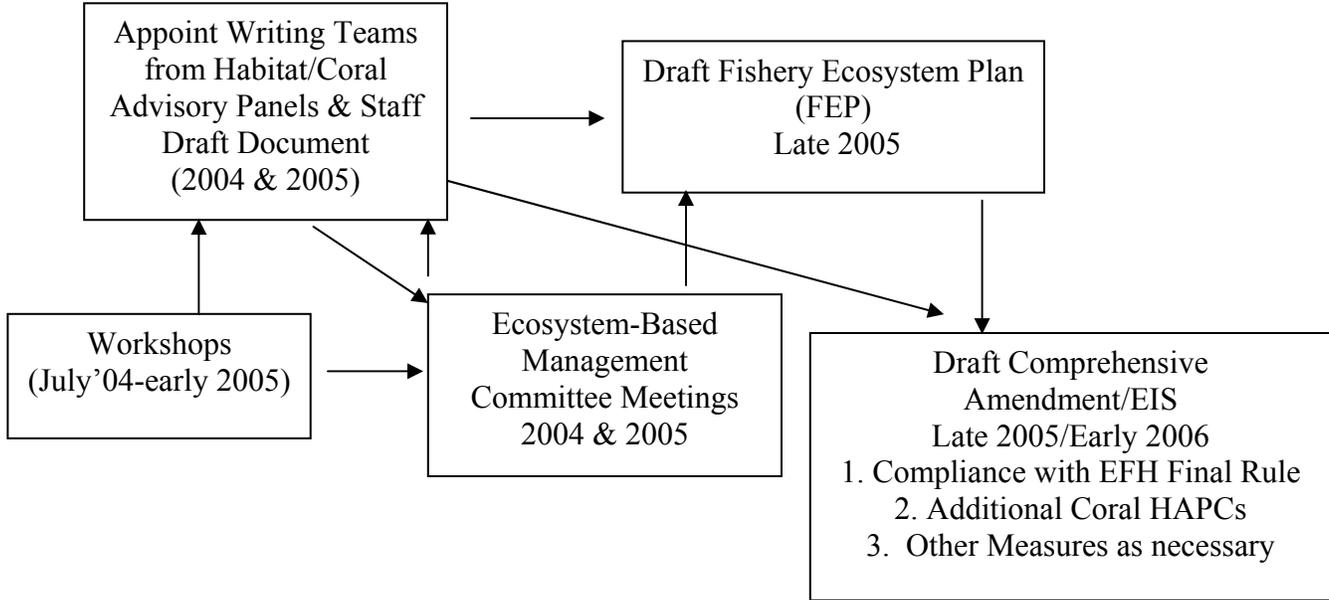
## SECTION 2. SAFMC FISHERY ECOSYSTEM PLAN DEVELOPMENT

### A. APPROACH: 5-YEAR SAFMC SYSTEM-WIDE EVALUATION



**B. TIMELINE 2004/2005**

**DATES ARE DRAFT AT THIS STAGE**



**C. PRELIMINARY LIST OF 2004/2005 WORKSHOPS**

Move to 2005	Workshops with Recreational/Commercial Fishermen & NGOs – Refining Available Fishing Location/Seasonal Operational, Gear and Habitat Information <ol style="list-style-type: none"> <li>1. 4<sup>th</sup>. Week in March: NC - 2 meetings; invite individuals</li> <li>2. 1<sup>st</sup> Week in February: SC - 2 meetings</li> <li>3. February 16-17: GA - 1 recreational and 1 commercial</li> <li>4. 2<sup>nd</sup>. Week in March: FL - 2 to 3 meetings</li> </ol>
September 19, 2004 (Pawley’s Island) November 16-18, 2004 (Charleston)	Social and Economic Workshops (2) to compile existing data and develop a research plan for conducting a socio-economic survey of our permitted fisheries
September 14-16, 2005	Workshop with agencies to explore additional incorporation of fishery issues in agency discussions
October 13-14, 2004	SAFMC ArcIMS Design Refinement Meeting (State GIS, SEFSC GIS, UNCW, USC Baruch Institute, USFWS, USGS, MMS, ACCSP, NMFS & NOS)
October 25-29, 2004	Workshops on Artificial Reefs, Marine Zoning and Impact of Fishing on Habitat. [This completes habitat issues not completed during 2003.] [Note: These will be held during the joint Habitat/Coral AP meetings October 25 (1pm) through October 29 (noon).]
February 7-11, 2005	Ecopath Model Workshops – Review and re-parameterization of developed Model and initiating of development of embedded sub-models
August 31 (1 pm) - September 3 (noon), 2004	Researcher Workshop (hold at Harbor Branch Institute) – Input on SAFMC Research and Monitoring Plans for: 1) The <i>Oculina</i> Experimental Closed Area Evaluation Plan and 2) Deepwater Habitat and Coral (including <i>Oculina</i> HAPC and <i>Lophelia</i> ) Research and Monitoring Plan. Workshop on Deepwater Habitat/Coral Research.
May 17 (1 pm) - 19 (noon), 2005	Regional Workshop on Research and Monitoring Needs for Ecosystem-Based Management and Development of an FEP for the South Atlantic Region (National and International Forum to Provide Guidance for Long-Term Planning to Support the Developing Fishery Ecosystem Plan)

**DATES ARE DRAFT AT THIS STAGE.**

#### **D. RESEARCH AND MONITORING NEEDS**

In its report to Congress, the Ecosystems Principles Advisory Panel recommended eight actions that regional Councils should undertake in order to move toward ecosystem-based fisheries management. The SAFMC is taking action to fulfill some of these recommendations. Specific activities are identified below. In addition, critical research and monitoring needs under these actions were identified during the Southeast Coastal Science Conference held in Charleston, South Carolina in January 2003. The conference focused on current and planned research, outreach, education, observations, monitoring, assessments and management in the South Atlantic Bight.

Actions to be taken under the FEP:

##### **1. Define the geographical boundaries of the ecosystem, including characterization of its biological, chemical and physical dynamics:**

###### **SAFMC Activities**

*Habitat Mapping- The SAFMC has undertaken cooperative mapping of deepwater coral habitat in the South Atlantic region. In partnership with the National Undersea Research Center at the University of North Carolina at Wilmington (NURC/UNCW), the Council will begin multi-beam sonar mapping of the outer continental shelf and upper continental slope off the coasts of North and South Carolina, covering a depth range of 100-500 m. Field-testing will occur January 2005 and the first offshore surveys will begin in October 2005.*

Significant additional funds will be needed to expand from the beta testing to not only map deepwater coral and snapper grouper habitat but also direct efforts onto the shelf to refine the mapping and characterization of all benthic habitats including those designated as EFH, EFH-HAPCs, SMZ, MPA or Coral HAPCs.

*Development of South Atlantic ArcIMS Server and Habitat/Ecosystem site- The SAFMC, in partnership with the Florida Marine Research Institute (FMRI) has developed an Essential Fish Habitat/Ecosystem homepage. The homepage hosts an Internet Map Server (IMS) application with links to downloadable bottom type data, associated metadata, substantial program information for the SAMFC, and links to related sites. The video and still imagery archives served from this site will provide researchers a unique opportunity to monitor coral health and abundance. It is strongly recommended that all research funded through programs in the South Atlantic provide results and metadata for inclusion into the regional system.*

Additional funds are required to expand information presented through the server and available on the Habitat/Ecosystem homepage. In addition, funds are required to capture readily available existing deepwater species information to support GIS for incorporation into the developing Council ArcIMS system and geodatabase.

*Development of a Oculina Experimental Closed Area Evaluation Plan -  
Preliminary Draft completed by August 2004  
Second Draft Reviewed by Habitat and Coral Advisory Panel October 2004  
Revised Plan Approved by SAFMC December 2004*

*Resources are required to complete mapping and characterization of habitats by  
December 2006.*

*Resources are required for research and long-term monitoring identified in the plan.  
All research areas identified must be addressed by 2013 (10 years after implementation  
of Amendment 13A).*

Funds are required for participation of State, University and other technical experts for participation in the FEP development process. Follow-up workshops will be held in 2004 and writing teams will be developing draft Section of the FEP. In addition, these individuals will also participate in review and writing of sections of the FEP in their field of expertise. It is also essential that appropriate personnel in NOAA Fisheries SERO, SEFSC, and NOS, and other appropriate NOAA individuals be provided travel to participate in the FEP development process.

**Additional Needs:**

- (i) Understand and model relationships of water flows among groundwater, riverine and estuarine systems and the impacts of water withdrawals and diversions on these systems
- (ii) Improve understanding of cross-shelf transport processes and the effects on larval recruitment, adult movement patterns, contaminant distribution and other exchanges
- (iii) Determine a mechanism to link oceanographic processes to ecosystem management
- (iv) Role of remote-sensing in mapping processes and populations
- (v) Develop a systematic approach to deliver high-resolution sea floor maps of shelf resources
- (vi) Determine the extent of hardbottom habitats on the shelf
- (vii) Evaluate locations and suitability of sand resources, the movement and fate of sand from beaches and the ecological impacts of beach renourishment
- (viii) Characterize and map coastal processes (i.e., currents, gyres, etc.)
- (xi) Determine the ecological impacts of channel maintenance including the transport and fate of sediments from disposal sites
- (x) Characterize benthic communities from soft and hard bottom habitats

- (xi) Better outreach of map resources to the public
- (xii) Relate coastal processes and mapping of shelf resources to EFH
- (xiii) Document the effects of trawling on soft and hard bottom shelf habitats

**2. Assess ecological, human and institutional elements of the ecosystem:**

**SAFMC Activities**

***Social and Economic Studies***

*Community Studies* – A project has been completed to document the location, type and some historical aspects of fishing communities in the south Atlantic region. This effort has been spearheaded by Council staff working in conjunction with independent social science consultants. In this first phase of work, as much secondary data as possible was collected and then “ground-truthed” with rapid assessment fieldwork in the fishing communities. The secondary data included U.S. Census records, landings, permits and state information. Some of the secondary data are still being compiled. There now exists a digital report of the communities in the south Atlantic region and a broad GIS that visually represents communities from 1998 through 2001. There is a great need for funding to update the GIS of communities.

The second proposed phase of the project includes a more in-depth study of a sample community (or communities), including ethnographic (detailed in-person) interviews with different members of each fishing sector in order to compile community histories and describe current fishing practices, conflicts, coastal development, etc. Further work will be done employing GIS techniques to map community natural resource use and fishing patterns, past and present. Some of this work is being carried out in conjunction with anthropologists in both the SERO and the SESC in the summer and fall of 2004.

*Cost/Earnings Data Collection – Closing the Information Gap* – The South Atlantic Council and NOAA Fisheries partnered to develop and implement a Cost/Earnings Data Collection Program for South Atlantic Fisheries in 2002. This involves a separate logbook in addition to the ongoing logbook data collected from fishermen in the commercial snapper grouper fishery and the king and Spanish mackerel fishery. Trip specific information such as fuel costs, grocery costs, gear and boat expenses, revenue earned per trip and crew share is collected from fishermen participating in the survey. An end of the year survey to collect complementary fixed costs and annual expenditures will be administered as part of the program.

- 2002 Trip Data - entered and data cleaned-up
- 2002 End of Year Data - entered and data cleaned-up
- 2003 Trip Data - being entered
- 2003 End of Year Data - surveys not distributed yet
- 2004 Trip Data - ongoing
- 2004 End of Year Data - scheduled to be sent April 2005.

Resources are required to expand and refine community research and cost and returns studies for all South Atlantic Fisheries.

**Additional Needs:**

(i) Document fleet dynamics in the South Atlantic commercial fisheries (including activity in Gulf and Mid-Atlantic/New England fisheries) using economic profiles. As a first step, existing data collection programs can be compiled in such a manner that it is possible to link vessels across fisheries and across states. Such preliminary models would form the basis for predicting fleet behavior under different management scenarios in a holistic manner (the flow of harvesting effort among different fisheries). These preliminary models can then be followed up with the development of more sophisticated simulation models that incorporate a wide array of biological, economic and social variables. [Note: The NMFS SERO is completing revisions to the permit database that will allow tracking vessels across different fisheries. The new system will be demonstrated at the December 2004 Joint Snapper Grouper Committee and Advisory Panel meeting in Atlantic Beach, North Carolina.]

(ii) Broad-scale multidisciplinary assessment of both natural and human resources (especially current land use and demographic profiles) to identify components of the system most sensitive to stress and to define research priorities

(iii) Improve cross-disciplinary communication that will facilitate the development of society-sensitive instruments responsive to the impacts of land use change on resource sustainability

**3. Develop a conceptual model of the food web:**

**SAFMC Activities**

*Ecopath Model Development - The SAFMC is currently partnering with Dr. Tom Okey (University of British Columbia) to develop an Ecopath model for the South Atlantic ecosystem from Cape Hatteras, North Carolina to the Florida Keys.*

Resources are required to complete/refine and expand the SA Ecopath Model. This includes additional contract funds to conduct workshops to review, revise and re-parameterize the developing model and initiate the development of possible embedded sub-models for the Oculina Bank HAPC, the Florida Keys, Deepwater Snapper Grouper Habitat, and Albemarle-Pamlico Sound. Additional funds are needed to re-program and optimize the model and develop an automated function to import GIS for habitat (EFH & EFH-HAPCs) and possibly environmental parameters. Funds are required for participation of State, University and other technical experts in model development. In addition, some participating individuals will also be involved in the review, writing or development of sections of the FEP in their field of expertise. It is also necessary that appropriate NOAA Fisheries, NOAA Beaufort Lab and NOS personnel participate in the ongoing Ecopath Model development process.

**4. Describe the habitat needs of different life history stages for all managed species (including protected resources):**

**SAFMC Activities**

*SAFMC has initiated coupling reporting of fishing location from VMS with known habitat characterization in the rock shrimp fishery.*

Funds needed to undertake research identified in the *Oculina* HAPC Research Plan

Funds needed to initiate comprehensive *Sargassum* research

**Additional Needs:**

- (i) Improve understanding of the life histories and critical habitats of deepwater species
- (ii) Improve understanding of the life histories of seriously overfished and infrequently encountered species
- (iii) Identify factors responsible for successful recruitment and develop indices of year class strength

**5. Calculate and characterize total removals (i.e., landings, effort, catch location, discards, and bycatch);**

**SAFMC Activities**

**Specifying these needs in FMPs since 1982**

**Specifying these needs in Annual Council/NMFS Operations Plan since at least 1989**

**ACCSP - Coordinating Council, Operations Committee, Technical Committees & Outreach Committee; began 199\_ ; system approved by all partners including NMFS \_\_\_\_\_**

**Logbooks - specified in FMPs**

**Cooperative Research on electronic logbooks**

(i) Track vessels across fisheries - ACCSP funded a project to transfer the NMFS Southeast Permits Database to Oracle. Based in part on this work, NMFS is scheduled to complete the transfer and have the capability to easily link the permit and landings databases. This will for the first time allow us to track vessel's landings across different fisheries. [Note: The new system will be demonstrated at the December 2004 Joint Snapper Grouper Committee and Advisory Panel meeting in Atlantic Beach, North Carolina.]

(ii) Coordinate all data management for managed species - this should include Metadata [Note: Check status of ACCSP projects related to metadata.]

(iii) Implement ACCSP - need to improve catch and effort and quality control

(iv) Develop methodologies for integrating data management into ecosystem management

(v) Collect gut content data

**6. Develop indices of ecosystem health (e.g., biological indicators):**

(i) Determine causes of HABs

(ii) Identify useful biological indicators to assess stress on estuarine systems

(iii) Develop long-term coordinated monitoring programs to document natural and anthropogenic variability in estuarine systems

(iv) Document the status and trends of estuarine fauna and their contaminant loads

(v) Better characterize the sources and impacts of nutrient inputs to rivers and estuaries

(vi) Better characterize the sources and impacts of contaminant inputs to rivers and estuaries

**7. Establish long-term monitoring:**

(i) Develop long-term coordinated monitoring programs to document natural and anthropogenic variability in estuarine systems

(ii) Determine which agency is responsible for conducting this monitoring

**8. Develop appropriate management including catch limits, gear regulations, zoning, etc.:**

**SAFMC Activities:**

**FMPs and Amendments - see pages 1 - 4 of this document for examples**

**Comprehensive EFH Amendment**

**Council document prepared for November 2003 Conference**

**Proceedings from the November 2003 conference**

**Snapper Grouper Amendment 14 (MPAs) - under development**

**Comprehensive FEP Amendment - under development**

(i) Develop decision criteria for siting of MPAs in the region

- (ii) Determine baseline conditions and evaluate response of newly established MPAs
- (iii) Expand research in the *Oculina* Bank HAPC

#### **E. STATEMENT OF WORK**

The statement of work focuses on the four tasks to be undertaken by the Councils to fulfill the requirements of the grant as identified by NMFS:

##### **1. Public Meetings with Stakeholder Groups**

The Councils, with assistance from appropriate NMFS staffs, will undertake a series of public meetings seeking input regarding ecosystem objectives for fisheries management. The purpose of these meetings will be to facilitate wide-ranging discussions with stakeholder groups and the general public in eight topic areas:

- (i) views regarding the adequacy of current approaches for addressing ecosystem considerations;
- (ii) the nature of ecosystem-based management and the goals to be achieved in addressing ecosystem issues;
- (iii) the nature of the public decision making processes within the FMCs for addressing management tradeoffs, consistent with identified goals;
- (iv) mechanisms for considering activities outside the FMC's purview but influencing ecosystem productivity;
- (v) the boundaries of sub-regional ecosystems within the areas of the various FMCs;
- (vi) the types of management measures that would be incorporated into ecosystem approaches for fishery management, consistent with the identified goals;
- (vii) the specific regional issues that need to be addressed in a fishery ecosystem plan (FEP);
- (viii) techniques for determining success of ecosystem-based management; and
- (ix) other issues considered important to the stakeholders in any particular region.

The importance of these stakeholder meetings conducted at the outset of the process of developing FEPs cannot be over-emphasized. The meetings are intended to survey as wide a cross section of views as possible before objectives for ecosystem approaches are adopted by the Councils. These meetings will serve to articulate the list of outstanding questions that should be addressed in both technical analyses and public policy decision-making. For example, if one species regulated in an existing FMP is a significant prey for predators regulated in another FMP, what technical and policy questions should be addressed in order to choose policies that result in the greatest benefit to society, consistent with applicable laws?

Regional stakeholder meetings should address the nine topic areas listed in part (1) above. Written minutes of the meetings should be kept, consistent with applicable operating procedures of the FMCs. A summary of public comments at the various stakeholder meetings should be provided. While the specific nature of public meetings will vary with each FMC, according to its circumstances, overall there should be

sufficient opportunity for all relevant stakeholder and public groups to provide input. This could involve meetings that are targeted to specific groups (e.g., fishing industry groups, local communities, NGOs, recreational fishing groups). Multiple opportunities within the purview of the various FMCs should be provided to encourage broad-based community participation.

**SAFMC Approach:** The Council will add “Ecosystem-Based Management” as an agenda item to each of the Advisory Panel meetings scheduled for 2004. Each Advisory Panel will be asked to address the items identified above as well as providing their recommendations on the Council’s approach to develop a Fishery Ecosystem Plan (FEP). In addition, they will be asked to provide input on what items should be addressed in the Comprehensive FEP Amendment. Minutes are routinely provided for all such meetings and Council staff provides a summary of recommendations for the Ecosystem-Based Management Committee. A document containing all input received during the scoping/stakeholder meetings will be prepared. Advisory Panels are scheduled to meet as follows:

Advisory Panel	Date/Location
Mackerel	June 16, 2004 in Key West, FL
Habitat	October 25-29, 2004 in Charleston, SC
Coral	October 25-29, 2004 in Charleston, SC
Shrimp	September 2004 in Pawley’s Island, SC
Snapper Grouper	February 2005
Marine Protected Areas	February 2005
Law Enforcement	October/November 2004
Information & Education	August 24-26, 2004 in Charleston, SC

The Council’s Scientific and Statistical Committee will address these issues during their September 2004 meeting. It is anticipated this will be held during the September 20-24, 2004 Council meeting in Pawley’s Island, SC.

In addition, beginning with the September 2004 meeting, the Council will schedule time during each species committee meeting and each Ecosystem-Based Management committee meeting to give the public an opportunity to provide input on these issues.

The Council will publish and widely distribute the agendas of the various advisory panels and Council meetings well before the meetings so that people understand that these issues will be considered as part of the specific advisory panel meetings and the Council meetings. The Council’s web site, newsletter and pre-meeting publicity will be used to get the word out to the public.

This approach follows our process for gathering stakeholder input and incorporating the input into our FMP/Amendment development process. All input will be compiled and summarized for use by the Ecosystem-Based Management committee to draft both the Fishery Ecosystem Plan and the Comprehensive FEP Amendment.

## **SAFMC Approach: Initial Outreach Component for Ecosystem-Based Management Action Plan**

Public involvement and understanding of the development and implementation of an Fishery Ecosystem Plan for the South Atlantic Region is key. As the Plan is developed through the use of workshops, stakeholder meetings, surveys, and other methods, it will be important to have informational materials available to the general public regarding the process and the issues involved in the development of a Fishery Ecosystem Plan.

### **Proposed Activities for FY 2004-2005 for Outreach/Education**

#### **A. Ecosystem Outreach Intern – College of Charleston Graduate Program in Environmental Studies (thesis project)**

- Directed toward development of materials for printed media and web-based information to complement development of the Fishery Ecosystem Plan.

#### **B. Integration of Ecosystem-based Management Approach into SAFMC Website**

- New introductory section on fishery ecosystem-based management to include background information, meeting schedules/information, summary materials and graphics. This will serve as the doorway to the Council's Ecosystem Homepage and Coral and Benthic Habitats ArcIMS mapping system developed in cooperation with FMRI. The homepage integrates documents and data sets related to management plans, coral and benthic habitats, ecology of the South Atlantic and managed species EFH and EFH-HAPCs.

## **2. Participation in Attitudes/Values Survey**

In addition to the regional public meetings developed as part of (1) above, an additional task used to gather public input into the process is to institute a formal questionnaire survey. The purposes of this survey are three fold: (1) the survey will be widely distributed to stakeholders and the general public within regions to provide additional opportunities for input (particularly for people not available to participate in stakeholder meetings) and (2) the survey instrument, if developed properly, will allow cross-comparisons among regions, stakeholder groups and other categories of interest, and (3) the survey will set a baseline from which attitudes and understanding about ecosystem principles can be measured once FEPs are developed and implemented. These comparisons can help in the development of national policies and objectives regarding ecosystem issues. Thus, careful attention to the details of an appropriate questionnaire survey are critical.

To develop an appropriate survey instrument that will meet these dual regional and national needs, a technical working group will be convened by the NMFS Office of Science and Technology (S&T). Participants in the working group will include staffs of the four regional Councils and appropriate NMFS staff. Additionally, outside expertise will be sought in social science survey questionnaire design. An initial workshop will be convened to develop candidate questions applicable to regional and national perspectives

relative to the eight issues noted in part a. above and to assure that the survey is administered consistently among the pilots. Following completion of the regional surveys, an additional workshop will be convened to analyze and develop a final report on survey results.

It will be the Council's role to assure that the questionnaire survey is widely distributed, advertised and completed. The Councils will develop lists of interested people, stakeholder groups and others to whom the questionnaire will be sent. Additionally, the Councils could develop an online questionnaire form and inform the public and stakeholders of the web address. Upon completion of the survey, each Council will develop a report of the extent of participation, by interest group, and summarize the findings of the survey, from the regional perspective. Additionally, the Councils will make available an electronic database from questionnaire responses to allow comparisons to be made across the four Councils participating in the pilot projects.

It is possible that the questionnaire survey may need to be vetted through OMB/PRA processes for approval. Accordingly, participation in this effort will be contingent upon such approval of the survey instrument, should it be required.

**SAFMC Approach:** The Council will provide two staff to serve on the working group responsible for development of this survey: Dr. Kathi Kitner (Cultural Anthropologist) and Dr. Vishwanie Maharaj (Economist). Both have extensive knowledge and experience in developing and conducting such surveys.

We recommend that the survey be administered by NMFS HQ using NMFS HQ funds. The South Atlantic Council will cover the costs for our two staff members to participate in developing the survey. Further, the survey should be developed with the core being a "national survey" covering the area of the four east coast Councils. Regional questions would be added for each Council's area. This type of survey lends itself well to being conducted on a contractual basis. There are a number of private sector firms experienced in conducting such surveys. It is strongly recommended that some type of scientific sampling be conducted versus randomly distributing the survey to our Council mailing list. The results from a scientifically selected sample will be much more useful.

### **3. Identification of Technical Needs and Inventory of Existing Information**

The purpose of this task is to identify, compile, and prioritize technical information needs and to consider the types of analyses necessary to support fishery ecosystem plan development and evaluation. This needs assessment is a critical element of formulating research and management approaches because it defines the likely important ecosystem linkages appropriate for each of the Council's ecosystems. For example, whereas potential habitat modifying effects of fishing gear may be considered of high priority to assess in one system, critical predator-prey relationships may be considered of a higher priority in a different Council's ecosystem. In all likelihood all of the identified interaction effects are likely to be of some importance in every region. However, it is the emphasis accorded particular issues (as identified in the public goal setting processes

noted above) that will define the priorities for management consideration and supporting research.

The identification of needs should specify technical information necessary to evaluate ecosystem interaction effects as given in the background material above and for implementing the eight steps for FEPs. The list of needs should include information necessary to identify bycatch and fishery interactions, predator-prey relationships and competition between and among species, essential fish habitat and the potential impacts of various fishing on the functional values of the identified habitat types. Additionally, the technical needs assessment should specify the types of ecological and social science data and assessments that would be required to inform public policy choices consistent with the types of goals identified in parts (a) and (b) above. This needs statement can be used by the Councils, NMFS and various cooperating research entities to develop proposals for research in support of ecosystem approaches and for coordinating research activities. If ongoing studies in various identified priority areas are being conducted, the source of such research and its intended completion date should be noted.

The format of this report should consist of a table listing the various issues being addressed by the Council in relation to ecosystem issues noted above, the types of research required to meet the presumed need, the status of ongoing research in the area (if any) and the priority attached to each activity. Issues related to modeling or synthesis of data into quantitative decision support tools should be noted separately.

A model for this technical needs assessment has been compiled by the South Atlantic FMC (South Atlantic Fishery Management Council, 2004). The SAFMC has developed several steps consistent with the eight requirements identified for FEPs, and for organizing technical workshops in support of the concept. If a Council (such as the SAFMC) has already progressed to the level of identifying a comprehensive set of ecosystem based research priorities, that council may use the portion of funds dedicated to this task to support operational meetings and workshops supporting the technical basis supporting FEP development.

**SAFMC Approach:** The SAFMC has developed a list of workshops for 2004/2005 that will address this and other needs. There is some overlap with the Council's workshops and those identified by NMFS. The workshops proposed by the SAFMC will focus on the South Atlantic ecosystem specifically and in great detail. The NMFS workshops will address issues across the area of jurisdiction of the four East Coast Councils. If future monies become available, a joint planning process involving the Councils should be initiated prior to allocating whatever monies are available.

The Ecosystem-Based Management committee will review and revise all input to develop recommendations for the Council. This material will go into the FEP and Comprehensive FEP Amendment.

#### **4. Synthesis of Public Input on Ecosystem Goals and Objectives**

This task is intended to synthesize the public input identifying ecosystem-based goals and objectives and the technical needs assessments into a strategy for FEP development. The Councils should develop a table that provides, at a minimum, the prioritized list of ecosystem considerations identified through public processes, as they relate to ecosystem interactions effects (e.g., predator-prey issues, essential habitats and effects of fishing gear, etc.). In order to address each issue identified, the relevant management authorities (Council and non-council), as well as a corresponding set of technical analyses should be identified, and some alternative management responses that may occur. The attached Table 1 provides the cross walk among hypothetical ecosystem issues identified, the respective Council and non-council management authorities, the technical requirements necessary to inform the decision making process, and some alternative management outcomes based on the results of technical analyses. The examples provided are for illustration purposes only and do not constitute judgments of the issues likely to be identified by stakeholders in particular regions, the technical requirements or actual management responses in relation to the issues identified. This table will be valuable in categorizing the types of issues identified by region, the appropriate management authorities, and the data and analysis requirements for issue resolution. The column addressing potential management responses is suggested primarily as an aid to identifying where FMP modifications may have to be made to accommodate potential resolutions. This synthesis will help define the scope of FEPs and the areas of particular emphasis in each region, as well as technical requirements supporting ecosystem-level decision-making. At some point in the process of FEPs the articulated ecosystem goals and objectives need to be viewed

**SAFMC Approach:** The Council will develop such tables in the FEP and Comprehensive FEP Amendment. The outreach intern will help with this task.

#### **5. Timeline and Deliverables**

The timeline and deliverables are shown in Table 2. All workshops will produce a written report outlining the accomplishments. All meetings with stakeholders will be compiled into a report of public input. All deliverables and detailed information will be provided to the Council's Ecosystem-Based Management Committee on an ongoing basis.

Table 1. Hypothetical synthesis of ecosystem issues, FMP and non-Council management authorities, technical requirements and policy responses. Issues are those developed through public scoping meetings and questionnaire surveys. [Examples are provided for purposes of illustration only and do not imply judgments regarding the issues concerned].

Ecosystem Issue Identified	Council FMPs Involved	Non-Council Regulatory Authorities	Technical Requirements for Informing Decision Making	Potential Management Responses
Scallop dredging activities potentially damage essential fish habitat (EFH) for groundfish species	NE Multispecies FMP  NE Sea Scallop FMP	State marine fisheries agencies for portions of habitats within state waters	(a) Define of EFH for groundfish species, (b) calculate functional values of various habitats identified, (c) map scallop effort to habitat types, (d) evaluate significance of habitat modifications occurring due to scallop dredging	(a) no restrictions required, (b) restrict scallop effort to non-essential bottom types, (c) develop gear modifications for scallop fishing, (d) consider zoning of scallop fishing to protect essential groundfish habitats
Pelagic longline fishing potentially results in excessive takes of endangered sea turtles	HMS Large Pelagic FMP	ESA Sea Turtle  ICCAT swordfish and tuna	(a) assess bycatch takes and mortalities in space and time (b) develop space time maps of target and bycatch species in relation to deployment of fishing gear (c) assess alternative gear designs to mitigate turtle bycatch	(a) no management response required since bycatch rates not impinging on turtle recovery, (b) require gear modifications to reduce takes, (c) restrict time and space distribution of fishing to minimize takes (including international effort, requires ICCAT authority)

Table 2. Timeline and deliverables.

	2004		2005			
	July-September	October-December	January-March	April-June	July-September	October-December
1. Public Meetings with Stakeholder Groups						
A. Conduct meetings	X	X	X	X	X	
B. Outreach intern	X	X	X	X	X	
B. Compile written report						X
2. Participation in Attitudes/Values Survey						
A. Two staff participate in survey design	X	X				
3. Identification of Technical Needs and Inventory of Existing Information						
A. Conduct workshops	X	X	X	X		
B. Written report from each workshop	X	X	X	X		
4. Synthesis of Public Input on Ecosystem Goals and Objectives						
A. Develop table					X	X

**APPENDIX 1. EFH, FEP AND ECOSYSTEM MODELING WORKSHOPS HELD DURING 2003.**

Date	Meeting/Workshop	Location
March 26-27, 2003	EFH/FEP Development Technical Workshops #1&#2- Coral, Coral Reefs and Live Hard Bottom Habitat, and Artificial Reefs	Florida Marine Research Institute, St. Petersburg, FL March 26 - 8:30AM - 5:00PM March 27 - 8:30AM - 3:00PM
May 19-21, 2003	EFH/FEP Development Technical Workshops #3-#6 - Wetlands (SAV & Mangroves) Pelagic Habitat ( <i>Sargassum</i> & Water Column) and	NOAA Lab Beaufort, NC Wetlands May 19 - 1:00PM - 5:00PM May 20 - 8:30AM - 12:00Noon Pelagic Habitat May 20 - 1:00PM - 5:00PM May 21 - 8:30AM - 12:00Noon
May 21-23, 2003	South Atlantic Ecosystem Modeling Development Workshop #1	NOAA Lab Beaufort, NC May 21 - 1:00PM - 5:00PM May 22 - 8:30AM - 5:00PM May 23 - 8:30AM - 3:00PM
July 1- July 2, 2003	EFH/FEP Development Technical Workshop #7- GIS	Florida Marine Research Institute, St. Petersburg, FL July 1 - 8:30AM - 5:00PM July 2 - 8:30AM - 3:00PM
August 19-21, 2003	EFH/ FEP Development Technical Workshops #8, #9 & #10 - Marsh, Oyster/Shell Habitat & Water Issues	Town & Country Inn Charleston, SC August 19 - 1:00PM - 5:00PM August 20 - 8:30AM - 5:00PM August 21 - 8:30AM - 3:00PM
September 23-25, 2003	South Atlantic Ecosystem Modeling Workshop #2	Florida Marine Research Institute, St. Petersburg, FL Sept. 23- 1:00PM - 5:00PM Sept. 24 - 8:30AM - 5:00PM Sept. 25- 8:30AM - 3:00PM
October 20-21, 2003	EFH/Ecosystem Workshop #11-Impacts of Fishing on Habitat (in conjunction with a Habitat and Coral AP Meeting)	Town & Country Inn Charleston, SC Oct. 20- 1:00PM - 5:00PM Oct. 21 - 8:30AM - 12:00Noon
October 21-22, 2003	EFH/Ecosystem Workshop #12 - Research and Monitoring (in conjunction with a Habitat and Coral AP Meeting)	Town & Country Inn Charleston, SC Oct. 21- 1:00PM - 5:00PM Oct. 22 - 8:30AM - 5:00PM

**APPENDIX 2. ECOSYSTEM-BASED MANAGEMENT COMMITTEE MEETING (2/5-6/04)**

**Ecosystem-Based Management Committee Meeting Report #1**

The first meeting of the Ecosystem-Based Management Committee took place February 5-6, 2004 in Charleston, South Carolina. This committee is comprised of the chairs of the species committee plus the chairs of the Habitat, Protected Resources, Marine Protected Areas, and EIS/NEPA committees.

Council staff reviewed the briefing material:

1. Ecosystem Plan/EIS/SAFE - A suggested approach to bring order to the varying mandates facing the Council. This was prepared by Council staff and presented to the Council in February 2002.
2. Ecosystem and Ecological Vocabulary - This was prepared by the NOAA Executive Panel and dated November 7, 2003.
3. Council presentations from the National Conference on Habitat and Ecosystem-Based Management. In addition, a preliminary approach to work for 2004 prepared by Council staff and given to NMFS in late 2003 was also provided.
4. Ecosystem-Based Fishery Management - A report to Congress by the Ecosystem Principles Advisory Panel (1999).

Dr. Louis Daniel (NC Division of Marine Fisheries) presented data on “Diversity in Fisheries of the South Atlantic” using North Carolina data. The data indicated fishermen routinely switch from one fishery to another during the course of a year. The committee discussed how this could be used to look at cumulative impacts and impacts from effort shift (e.g., new regulations in the snapper grouper fishery could result in increased effort in the mackerel fishery).

The Committee developed the following list of items to consider:

1. WHAT ARE THE INTERACTIONS ACROSS FISHERIES IN SC, GA & FL? [EXPAND NC ANALYSES] [GET # NON-RESIDENT LICENSE HOLDERS IN EACH STATE]- SHORT-TERM
2. CONSIDERATION OF GEAR IMPACTS WITH PR & MM SPECIES AND OTHER NON-TARGET SPECIES.
3. TOTAL SYSTEM OUTPUT ANALYSIS? WHAT IS TOTAL BIOMASS BEING REMOVED FROM CAPE HATTERAS SOUTH?
4. ASSESS HOW THIS IMPACTS NATIONAL STANDARD 9 (BYCATCH)?
5. PREDATOR/PREY RELATIONSHIPS?
6. DEVELOPING A BETTER UNDERSTANDING OF COMPLEX BIOLOGY OF SPECIES TO BETTER UNDERSTAND WHETHER THE YIELDS ARE COMMERCIALY SUSTAINABLE?
7. DIET ANALYSES? GUT CONTENT WORK.
8. CAN'T HAVE ALL SPECIES AT MSY?

9. WHAT IS CURRENTLY GOING ON IN TERMS OF ON-GOING RESEARCH? WHAT IS PROJECTED TO BE DONE? WHO WILL DO IT?
  10. WHAT BASIS INFO DEV. BY YEAR OVER THE PAST 3 YEARS?
  11. RESEARCH PROJECTS THAT PROVIDE DIRECT SUPPORT FOR ECOSYSTEM BASED MODELS?
    - A. STATE FUNDED WORK?
    - B. STATE PROJECTS WITH FED \$.
    - C. SEA GRANT PROJECTS
    - D. SK PROJECTS
    - E. MARFIN PROJECTS
    - F. NMFS PROJECTS
    - G. COOPERATIVE PROJECTS
    - H. FOUNDATION
    - I. FWS
    - J. EPA
    - K. OTHER UNIV PROJECTS (NSF FUNDING)
    - L. OTHER NOAA RESEARCH  
(SANCTUARIES, NOS, ETC.)
    - M. NGO PROJECTS
- [INTENT THAT PROJECTS NOT BE DOUBLE COUNTED; WHO PLAYERS ARE; SOURCE AND LEVEL OF FUNDING; OUTPUTS, ETC.; PROJECTED COMPLETION DATE]
12. MINIMUM DATA ELEMENTS NECESSARY FOR A ECOSYSTEM PLAN?
  13. RESEARCH ON ALTERNATIVE APPROACHES TO ALLOCATING TAC WITHIN THE COMMERCIAL SECTOR ACROSS FISHERIES
  14. BETTER UNDERSTANDING OF SOCIAL AND ECONOMIC IMPLICATIONS OF MANAGEMENT
  15. DETERMINE YIELDS FROM MANAGEMENT AREA AND HAVE ONE PERMIT (WITH ENDORSEMENTS FOR INDIVIDUAL FISHERIES) AND LET MARKET DETERMINE HOW MUCH TAC IS HELD BY INDIVIDUALS.
  16. DETERMINE WHAT ECOSYSTEM OVERFISHING MEANS. EXPLORE CHANGING SFA DEFINITIONS TO ADD ECOLOGICAL OVERFISHING TO CONSIDER MULTI SPECIES PARAMETERS RATHER THAN CURRENT SINGLE SPECIES APPROACH.
  17. PRECAUTIONARY APPROACH - HOW APPLY TO ECOSYSTEM-BASED MANAGEMENT
  18. EXPLORE LEGAL ASPECTS OF HOW FAR WE CAN GO IN TERMS OF PRECAUTIONARY MANAGEMENT (E.G., KIM CONNOLLY @ USC LAW SCHOOL); CONTRAST WITH ACTIONS ON SARGASSUM & DOLPHIN WAHOO FMPs
  19. RECOMMENDATIONS ON MODIFICATIONS TO MAGNUSON ACT TO FULLY IMPLEMENT ECOSYSTEM-BASED MANAGEMENT
  20. ADDRESS COMPLIANCE IN DEVELOPING ECOSYSTEM MANAGEMENT
  21. DRAW PUBLIC INTO PROCESS FROM START
  22. WHAT CAN ECOSYSTEM SUPPORT WRT MSY & OY?

23. CONTRAST CURRENT LEVEL/QUALITY OF HABITAT WITH HABITAT YEARS AGO AND DETERMINE IMPACTS ON STOCK LEVELS (COMPARE OCEANIC SPECIES WITH ESTUARINE DEPENDENT SPECIES)
24. DEFINITION OF ECOSYSTEM - HUMANS ARE FIRST PART OF THIS; SCIENTISTS MUST COMMUNICATE ACROSS DISCIPLINES
25. TRAINING ON USE OF MODELS AND ABILITY TO INCORPORATE EXPERT (SCIENTISTS, PROFESSIONAL FISHERMEN, ETC.) KNOWLEDGE
26. HOW DOES THIS WORK? GOING FROM INFORMATION TO REGULATING UNDER OUR CURRENT MANAGEMENT STRUCTURE.  
AMENDMENT ADDRESSING 1 OR MORE FMPs.
27. HAVE METADATA MODULE COMPLETED FOR THE ACCSP PROGRAM.
28. LIST OF KNOWN AND UNKNOWN (E.G., PRED/PREY - KNOW FLOWS BUT CAN'T QUANTIFY); IF DON'T HAVE THE INFORMATION, DEVELOP A PLAN TO GET THE INFORMATION
29. LIST OF DATA/RESEARCH NEEDS FOR EACH FMP
30. BYCATCH ISSUES/REGULATORY DISCARDS
31. GHOST POTS IN BLACK SEA BASS POT FISHERY; COMPLIANCE WITH ESCAPE PANELS/DEGRADABLE PANELS
32. PARTNERSHIPS WITH AGENCIES TO DEVELOP FEP; FUNDING ISSUES HAVE REDUCED THE ABILITY TO PARTICIPATE; COORDINATION WITH ASMFC AND STATES; EXPLORE MECHANISMS TO INCREASE PARTICIPATION
33. INVOLVE APS AND ENVIRONMENTAL COMMUNITY
34. HMS GROUP; EXPLORE WAYS TO INVOLVE THEM WITH OUR FEP, PARTICULARLY FOR DOLPHIN/WAHOO AND SARGASSUM INTERACTIONS
34. CONDUCT POST- CONTROLLED ACCESS STUDY IN THE SNAPPER GROUPER FISHERY TO GATHER DETAILED SOCIAL AND ECONOMIC DATA
35. CONDUCT IN-DEPTH SOCIAL STUDIES WITHIN REPRESENTATIVE COMMUNITIES IN THE SOUTH ATLANTIC (OBSERVE TRIPS, MULTIPLE DAYS SPENT IN ONE AREA)

The Committee directed staff to use the summary recommendations from the report of the National Ecosystems Principles Advisory Panel as a outline for development of our documents. Staff was further directed to prepare a draft outline and integrate the list of items above for the next committee meeting during the June Council meeting. Finally, staff was directed to draft a letter to NMFS with a cc to Chris Rogers indicating the importance of HMS's participation in our ecosystem work.

It is the Committee's intent to prepare an outline indicating the Council's approach to Ecosystem-Based Management at the June meeting. This document would then be available to the public after the June meeting.

**APPENDIX 3. ECOSYSTEM CY 2004/05 ACTIVITIES SCHEDULE AND BUDGET**

SEE ATTACHED TABLE