SAFMC Fishery Ecosystem Plan II Summary and Two Year Roadmap

Draft Update

December 2020

Abbreviations and Acronyms

ABC	Acceptable Biological Catch
ACL	Annual Catch Limits
APNEP	Albemarle Pamlico National Estuary Program
ASMFC	Atlantic States Marine Fishery Commission
BMP	Best Management Practices
BOEM	Bureau of Energy Management
CCFHR	NOAA's Center for Coastal Fisheries Habitat Research
CFMC	Caribbean Fishery Management Council
CFR	Code of Federal Regulations
CHA	Critical Habitat Area
CHAPC	Coral Habitat Area of Particular Concern
CZM	Coastal Zone Management
DOD	Department of Defense
EA	Environmental Assessment
EBFM	Ecosystem Based Fishery Management
EED	Energy Exploration and Development Policy
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat – Habitat Area of Particular Concern
EFP	Experimental Fishing Permit
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FEP	Fishery Ecosystem Plan
FEP I	Fishery Ecosystem Plan I
FEP II	Fishery Ecosystem Plan II
FMP	Fishery Management Plan
FWRI	Florida Fish and Wildlife Resource Institute
GIS	Geographic Information System
GMFMC	Gulf of Mexico Fishery Management Council
HBOI	Harbor Branch Oceanographic Institute
IOOS	Integrated Ocean Observing Network
LNG	Liquid Natural Gas
MP	Marine Protected Area
A	Management Strategy Evaluation
MSE	National Centers for Coastal Ocean
NCCOS	Science
NCDEQ	North Carolina Department of Environmental Quality
NCDMF	North Carolina Division of Marine Fisheries
NCSU	North Carolina State University
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries
NOAA	National Oceanographic Atmospheric Administration
OHC	Office of Habitat Conservation

FAU	Florida Atlantic University	**OLE**	Office of Law Enforcement

USGS CSC USGC Climate Science Center

NOAA PRD NOAA Protected Resources Division

NOAA RISA NOAA Regional Integrated Sciences and Assessments Program

SAFE Stock Assessment and Fishery Evaluation Report

SAFMC South Atlantic Fishery Management Council

SALCC South Atlantic Landscape Conservation Cooperative

SARP Southeast Aquatic Resources Partnership

SAV Submerged Aquatic Vegetation

SEAMAP Southeast Area Monitoring and Assessment Program

SECAS Southeast Connectivity Adaptation Strategy

SECOORA Southeast Coastal and Ocean Observing Regional Association

SEDAR Southeast Data Assessment and Review

SEFSC Southeast Fisheries Science Center

SERFS Southeast Reef Fish Survey

SHA Special Habitat Area

SMZ Special Management Zone

SSC Scientific and Statistical Committee

TACTS Tactical Aircrew Combat Training System

USACOE United States Army Corps of Engineers

USCG United States Coast Guard

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

Introduction

The South Atlantic Fishery Management Council developed the Fishery Ecosystem Plan (FEP) II as a mechanism, in cooperation with NOAA Fisheries, to incorporate ecosystem principles, goals, and policies into the fishery management process. A core part of the FEP II development process involved engaging the Council's Habitat Protection and Ecosystem Based Management Advisory Panel and regional experts in developing new Sections and ecosystem specific policy statements to address South Atlantic food webs and connectivity and South Atlantic climate variability and fisheries. In addition, the Council also updated standing essential fish habitat policy statements and developed a new artificial reef habitat policy statement. In combination, these statements advance habitat conservation and the move to ecosystem-based fishery management (EBFM) in the region and provided a foundation to develop the FEP II Implementation Plan. Council policies developed through the process support data collection, model and supporting tool development, and implementation of Fishery Ecosystem Plan II. The FEP II, the FEP II Implementation Plan, and this roadmap also provide a metric for determining the incorporation of ecosystem considerations into the management process. The Implementation Plan is not intended to direct or instruct any external program, organization, or entity to undertake a specific action or to reprioritize their work or programs. The Habitat Protection and Ecosystem Based Management Advisory Panel met in 2018, 2019 and 2020 to provide input on State, NOAA and regional partner activities conducted which address Actions in the Two Year Roadmap. This update draws from panel member and other regional partner input to highlight actions initiated or accomplished to address priority actions presented in the 2018 Two Year Roadmap.

Background

Habitat Conservation and the Fishery Ecosystem Plan

The Council, viewing habitat conservation as the foundation in the move to ecosystem-based fishery management in the region, facilitated the evolution of the Habitat Plan into the first FEP (2009). This approach required a greater understanding of the South Atlantic ecosystem and the complex relationships among humans, marine life, and the environment including essential fish habitat. To support this move, the Council adopted broad goals for ecosystem-based fishery management including: maintaining or improving ecosystem structure and function; maintaining or improving economic, social, and cultural benefits from resources; and maintaining or improving biological, economic, and cultural diversity. The original FEP served as a source document describing the South Atlantic ecosystem and the impact of fisheries on the environment.

The Council developed the Fishery Ecosystem Plan II as a mechanism to incorporate the evaluation and consideration of ecosystem principles, goals, and policies into fishery management in the region. The FEP I which has evolved to the living FEP II Dashboard and associated online tools provides a clear description and understanding of the fundamental physical, biological, and human and institutional context of South Atlantic ecosystems within which fisheries are managed. In addition, the FEP II builds on existing and advances new policies that guide future evaluation and implementation and advancement of habitat conservation and ecosystem-based fishery management in the region. The guidance is consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan, the Comprehensive EFH Amendment, the Fishery Ecosystem Plan of the South

Atlantic Region, Comprehensive Ecosystem-Based Amendment 1, Comprehensive Ecosystem-Based Amendment 2, and the various Fishery Management Plans (FMPs) of the Council.

NOAA Ecosystem-Based Fishery Management Policy and Roadmap

Managing fisheries over the long-term means considering habitat conservation and managing more than just one species at a time. Advancing this more holistic, science-based approach which looks at the entire ecosystem is known as ecosystem-based fisheries management (EBFM).
To support this move, NOAA Fisheries developed an agency-wide EBFM policy and roadmap, (Available through Ecosystem page of the FEP II Dashboard http://safmc.net/fishery-ecosystem-plan-ii-south-atlantic-ecosystem/) outlining a set of principles to guide actions and decisions over the long-term to: implement ecosystem-level planning; advance our understanding of ecosystem processes; prioritize vulnerabilities and risks of ecosystems and their components; explore and address trade-offs within an ecosystem; incorporate ecosystem considerations into management advice; and maintain resilient ecosystems.

The FEP II new sections were developed employing writing and review teams established from the Council's Habitat Protection and Ecosystem Based Management Advisory Panel, and experts from state, federal, NGOs, academia and other regional organizations and associations. The FEP II, unlike the original FEP, is a living and continually developing online information system. It consists of core sections and sections with links to documents or other online resources presenting detailed updated information on species, habitat, fisheries and research. The FEP II for example, provides both concise summaries of Council managed species and a link to detailed species information available through the Ecospecies, developed jointly with Florida Fish and Wildlife Research Institute (FWRI). The online information system provides access to comprehensive information on habitat, life history, the fishery and management.
The more concise and focused FEP II also addresses new key issue areas including highlighting our understanding of the complexity and connectivity of South Atlantic food webs, as well as, the implications of climate variability on fisheries. This information can be used as the basis for the following:

- Further policy development
- Consideration in habitat and fish stock assessment
- Future management of fisheries and habitat
- Support for a more comprehensive view of conservation and management in the South Atlantic
- Identification of long-term and shorter-term information needs

In summary, the FEP II advances the move to EBFM in the region through enhancing the capabilities of available models and tools used to manage habitat and fisheries. A key tenet of EBFM is the consideration of potential indirect effects of fisheries on food web linkages when developing harvest strategies and management plans.

Goals of EBFM in the South Atlantic Region

The FEP II and the implementation plan support the Council's broad goals for ecosystem based fishery management:
GOAL 1: Maintaining or improving ecosystem structure and function.
GOAL 2: Maintaining or improving economic, social, and cultural benefits.
GOAL 3: Maintaining or improving biological, economic, and cultural diversity.

FEP II Implementation Plan Structure and Structure

The Implementation Plan is structured to translate approved policy statements of the SAFMC into actionable items. The plan therefore encompasses chapters beginning with an introduction to the policy statement, a link to the complete policy statement, and a table which translates policies and policy components into potential action items. The actions within the plan are recommendations for activities that could support the Council's FEP II policies and objectives. The Implementation Plan is not intended to direct or instruct any external program, organization, or entity to undertake a specific action or to reprioritize their work or programs. The entities listed in the "Potential Partner" column are suggested partners for the actions. Each year the Habitat Protection and Ecosystem Based Management Advisory Panel, during their spring meeting, will discuss actions addressed in the previous year as summarized by Council staff.

FEP II Two Year Roadmap

This FEP II Two Year Roadmap draws from the Implementation Plan and presents three to five priority actions for each of the nine approved policy statements of the Council which would be initiated or completed over the next two years. The Roadmap provides "Potential Partners" and other potential regional collaborators, a focused list of priority actions they could cooperate with the Council on to advance policies supporting the move to EBFM in the South Atlantic Region.

This update provides an overview of status of actions identified in the Roadmap and identifies State, Federal or regional partners who have or are addressing the priority actions since the approval of the implementation plan and Two Year Roadmap. Links to materials are included however bold numbers in the Associated Activities box coincides with a pdf package of associated documents.

The following chart visually represents the translation of SAFMC policies presented in policy statements and FEP II sections where appropriate, into actionable items that support the implementation plan for the FEP II.

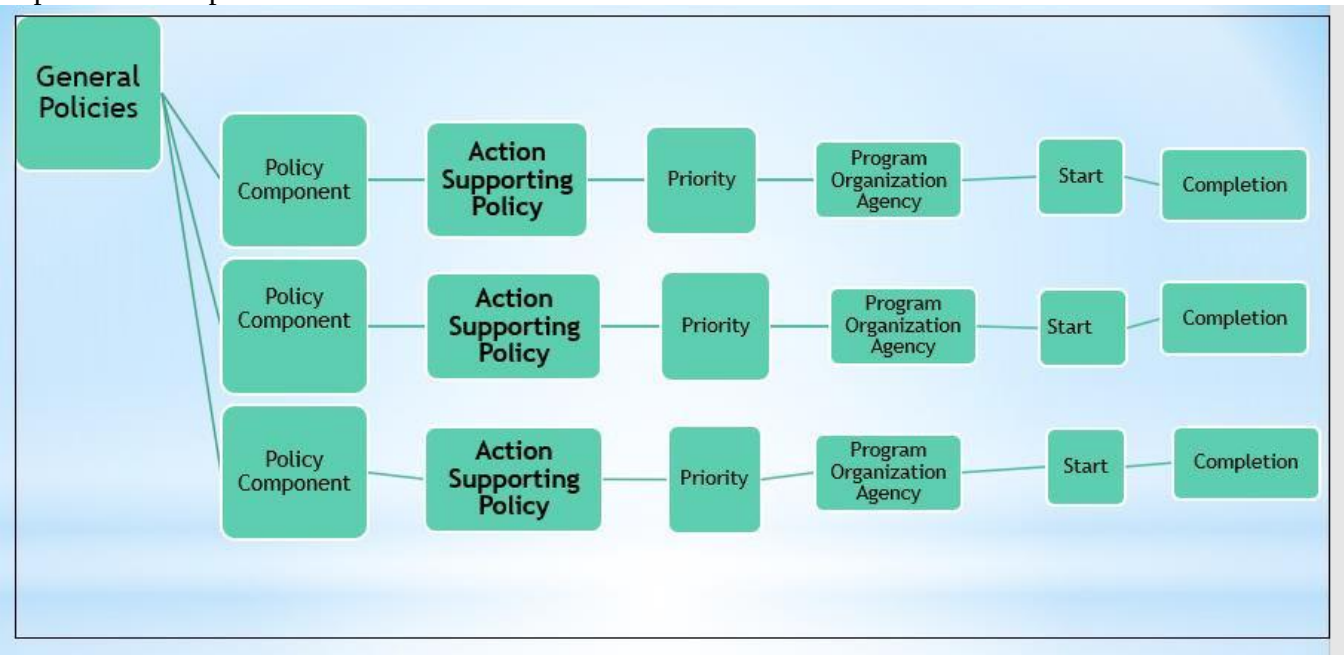

Figure 1. Visual representation of SAFMC policies into action items presented in the Two Year Road Map and supporting the Implementation Plan for FEP II.

Chapter 1. South Atlantic Food Webs and Connectivity

POLICY CONSIDERATIONS FOR SOUTH ATLANTIC FOOD WEBS AND CONNECTIVITY AND ESSENTIAL FISH HABITATS (Adopted December 2016)

Introduction to Policy Statement

This policy provides guidance from the South Atlantic Fishery Management Council (SAFMC) regarding South Atlantic Food Webs and Connectivity and the protection of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (EFH-HAPCs) supporting the Council move to ecosystem-based fishery management. For the purposes of policy, the findings assess potential threats and impacts to managed species EFH and EFH-HAPCs and the South Atlantic ecosystem associated with changes in food webs and connectivity and processes that could improve those resources or place them at risk. The policies and recommendations established in this document are designed to address such impacts in accordance with the habitat policies of the SAFMC as mandated by law.

Policy Considerations

EBFM addresses unintended consequences of fishing including the over-exploitation of predators, an increase in abundance of their prey, and a decline of organisms two trophic levels below them, a phenomenon known as a trophic cascade. Alternatively, fishing on lower trophic level species, planktivorous "forage" fishes for example, may ultimately lead to predator population declines due to food limitation. Food web linkages connect different components of the larger ecosystem, such as pelagic forage fishes and their piscivorous predators or demersal carnivores. This connectivity between food webs over space, time, and depth creates multiple energy pathways that enhance ecosystem stability and resilience. Food web models are increasingly being utilized by fisheries managers as ecological prediction tools because they provide the capability to simulate the entire ecosystem from primary producers to top predators to fisheries.

Activities associated with applying modeling to management were highlighted in a NMFS National Ecosystem Modeling Workshop where all the Science Centers gave brief updates of recent modeling efforts and how they are being used for management. The Alaska Fisheries Science Center indicated food web models are updated frequently and are used regularly in fishery management advice in annual Stock Assessment and Fishery Evaluation reports and management strategy evaluations were conducted for three groundfish species from the Bering Sea. The Northeast Fisheries Science Center created a simple aggregate group production model to explore trade-offs between management objectives related to fisheries and marine mammals. The Pacific Islands Fisheries Science Center built the Guam Atlantis Coral Reef Ecosystem Model which identified management strategies for evaluation as well as metrics for measuring their effectiveness and an Ecopath with Ecosim model to evaluate ecosystem structure and energy flows for two subpopulations of Hawaiian monk seals in the Northwest Hawaiian Islands. The Southeast Fisheries Science Center is collaborating with ASMFC on ecosystem reference points for management use whereby stakeholders have defined goals and objectives. The Northwest Fisheries Science Center is evaluating trade-offs in harvest of forage fish versus predator populations using an Atlantis model, MICE, and Ecopath models.

Food web models can serve to inform single species assessment and management and are capable of generating reference points and ecosystem-level indicators. This policy addresses

characterization of food web dynamics, development of food web indicators and evaluation of management actions on these systems.

Link to Complete Policy Statement:
http://safmc.net/download/SAFMC_HabitatPolicy_FoodWebConnectivity_Final_Dec2016.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in two years as presented in Table 1 Policy to Action Excel spreadsheet for Food Web and Connectivity in the FEP II Implementation Plan.

Table 1. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Chapter 1. South Atlantic Food Webs and Connectivity

Policy Component Addressed for Action 1:

Forage Fisheries – Consider forage fish stock abundances and dynamics, and their impacts on predator productivity, when setting catch limits to promote ecosystem sustainability. Refine list of forage fish species presented in Appendix A of the Policy Statement. Quantify managed species diet compositions to identify predator dependency of forage species both spatially and temporally in the South Atlantic. Collect more science and monitoring information to improve our understanding of the role of forage fish in the ecosystem. (Forage species life history, ecological roles, and migration patterns).

Action 1:	Priority	Initiated	Status	Partner/s	Associated Activities
Council facilitate development of intra-state innovative public/private research partnerships that focus on addressing Council forage fish science priorities including predator dependencies.	High	2018	Ongoing	SCDNR, South Atlantic SEAMAP, MARMAP, SEFIS, FWRI, NC DMF, GDNR and EcoSpecies.	SA EwE model development engaged state, Federal and regional experts to integrate available data and provide priorities to enhance characterization of prey/forage species represented. Priorities have been highlighted for state and federal fishery independent programs to expand existing collection or collaborate in development of new surveys engaging fishermen in data collection (e.g., bottom longline).
		2019	Ongoing	SAFMC	Development of the Council's Citizen Science program https://safmc.net/citizen-science-program/ establishes a platform to evaluate citizen collection of priority species for diet analyses, life history or validate environmental preferences of habitat use. **1** https://safmc.net/download/CitizenScienceProgram_SOPPs/Appendices/AppendixC_SAFMCCitSciResearchPriorities_AdoptDec2019.pdf
		2018	Completed October 2020	SCDNR, NOAA Fisheries HCD, USACOE	SCDNR working with NOAA Fisheries HCD received funding from the USACOE and conducted a Folly Beach Renourishment Study during summer to look at the subtidal trophic state and conduct diet studies during beach fill activities**. 2** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A14b_Tweel_2018FollyNourishment_Monitoring.pdf

Table 1 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Action 1 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
Identify species for which diet data are lacking and prioritize future research accordingly.	High	2018	Ongoing	FWRI, SCDNR, NCDMF, SEAMAP, MARMAP, SEFIS,	Development of prey/diet compositions and the diet matrix for the SA EwE model provided priority species including shallow way=ter groupers and tilefish where diets would enhance the model which have been provided to SEAMAP/MARMAP/SEFIS and other research programs **3** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A06_Gentry_SSC%20EwE%20Presentation%20October%202020.pdf List included in EwE presentation and updated SEAMAP 2021-2026 Plan under development.
		2018	Ongoing	NC DMF	NC DMF provided and analyzed data for forage fish/diet of fishery species. Chaired the EwE Model Review Workgroup and provided data for bullet and frigate mackerel and other species used in the EwE model from tournament sampling. **4** https://safmc.net/download/Briefing%20Book%20Habitat%20AP%20Nov18/Presentations/3%20-%20Poland%20Pres_HabitatAP_Auxis_DW_10262018.pdf
Define and prioritize major forage groups in managed species diet composition.	High	2018	Ongoing	FWRI, SCDNR, NCDMF, SEAMAP, MARMAP, SEFIS,	Prey/diet compositions and a diet matrix was developed for the SA EwE model provides the ability to both define and prioritize all prey including forage species where known as well as identify the diet overlap between managed species.
Include forage fish information (species occurrence and distribution of biomass with variable environmental conditions) in the AE chapter of FMP amendments and other management actions to support the development of sustainable harvest strategies that incorporate ecosystem considerations and trade-off.	High	General issue noted in 2018 AE Chapters	Ongoing Spatial layers and where possible biomass estimates will be available as Ecospace is developed	SCDNR, SEAMAP, MARMAP, SEFIS, FWRI, NC DMF, and EcoSpecies.	The SA EwE model and the previous EwE model version focused on forage fish species provides baseline information. **3** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A06_Gentry_SSC%20EwE%20Presentation%20October%202020.pdf SA EwE and Ecospace development process highlights priority prey diet and forage species, life history information where available needed to enhance FMPs. EcoSpecies http://saecospecies.azurewebsites.net serves life history for prey/forage and other species in the ecosystem.

Table 1 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Characterize life history of primary prey for Council managed species, including snapper grouper, king and Spanish mackerel, cobia, dolphin and wahoo.	High	2018	Ongoing	SCDNR, South Atlantic SEAMAP, MARMAP, SEFIS, FWRI, NC DMF, and the EcoSpecies.	Prey/diet compositions and a diet matrix was developed for the SA EwE model and prey for all managed and other species in the model. **3** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A06_Gentry_SSC%20EwE%20Presentation%20October%202020.pdf Development of the diet matrix for the model provided priority species where diets would enhance the model which have been provided to SEAMAP/MARMAP and SEFIS and other research programs. Ecospecies system includes life history, where available prey of managed species http://saecospecies.azurewebsites.net/
		2019	2020	ASMFC	ASMFC developed ecosystem-based reference points for Atlantic Menhaden which is prey of king and Spanish mackerel, bluefish, and other species depending on life stage **5** https://www.asmfc.org/uploads/file/5e4c4064AtlMenhadenERPAssmt_PeerReviewReports.pdf
Policy Component Addressed for Action 2: Develop Food Web Indicators. Develop food web indicators to inform future management actions.					
Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Develop food web indicators to summarize the state of knowledge of the South Atlantic food web/ecosystem.	High	2018	Draft 2020	SAFMC, NOAA Fisheries SEFSC, SECAS, FWRI/Ecospecies, and Academia	NOAA EBFM Implementation Plan supports development of a South Atlantic Ecosystem Status Report **6** https://safmc.net/download/BB HabitatEcosystem AP Oct20/A03_Craig Ecosystem Status Report Oct20.pdf and the South Atlantic Climate Vulnerability Assessment **7** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A02_Burton_SAFish%20Climate%20Vulnerability%20Assessment.pdf with drafts inhouse in the SEFSC.

Table 1 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Policy Component Addressed for Action 3: Develop Food Web Indicators. Develop food web indicators to inform future management actions.					
Action 3:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Develop ecosystem indicators that could be included in a NOAA SA Ecosystem Status Report that documents and characterizes key managed and prey species, environmental drivers of those species, and mechanisms to monitor those drivers / species, etc.	High	2018	Draft 2020	SAFMC, NOAA Fisheries SEFSC, SECAS, FWRI/Ecospecies, and Academia	The Action, was initiated as part of the NOAA EBFM Implementation Plan. An update on development of a Draft South Atlantic Ecosystem Status Report **6** https://safmc.net/download/BB HabitatEcosystem AP Oct20/A03_Craig Ecosystem Status Report Oct20.pdf and a Draft South Atlantic Climate Vulnerability Assessment **7** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A02_Burton_SAFish%20Climate%20Vulnerability%20Assessment.pdf which is moving through inhouse review in the SEFSC and will in part provide ecosystem indicators was provided during the Oct. 2020 Habitat and Ecosystem AP webinar.
Policy Component Addressed for Action 4: Food Web Connectivity – Separate food webs exist in the South Atlantic: inshore-offshore, north-south, and benthic-pelagic, connected by species that migrate between them such that loss of connectivity could have impacts on other components of the ecosystem that would otherwise appear unrelated and must be accounted for. Refine understanding of species use of habitat by season.					
Action 4:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Characterize seasonal patterns for managed species exhibiting seasonal north-south movement: major snapper grouper species including gag, jacks, cobia, dolphin, mackerels etc. Complete in coordination with the climate team.	High	2018	Draft 2020	SAFMC, NOAA Fisheries SEFSC, SECAS, FWRI/Ecospecies, and Academia	NOAA EBFM Implementation Plan supported development of a South Atlantic Ecosystem Status and the Draft Climate Vulnerability Assessment Report which are moving through inhouse review in the SEFSC **7** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A02_Burton_SAFish%20Climate%20Vulnerability%20Assessment.pdf Data from the Ecospecies system were used in the development of the SA Climate Vulnerability Assessment http://saecospecies.azurewebsites.net/ Analyses of SEAMAP data presented to Habitat And Ecosystem AP provides an initial look at seasonal patterns **8** https://safmc.net/download/Briefing%20Book%20Habitat%20AP%20May%202018/Presentations/2_Pres%20Udouj%20Habitat%20Ecosystem%20GIS.pdf

Table 1 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Action 4 (cont.):	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
		2018	Ongoing	SECOORA	The FACT Network, https://secoora.org/fact/ supported by the regional ocean observing association SECOORA, includes partners from the Bahamas to the Carolinas with 93 Member Organizations and 283 Members, is a grassroots collaboration of marine scientists using acoustic telemetry and other technologies to better understand and conserve our region's important fish and sea turtle species with the number of tagged animals over 5,000 individuals from 83 species released to date with publications **9** https://secoora.org/fact/resources/fact-network-member-publications/ including Council and State managed species
Policy Component Addressed for Action 5: Trophic Pathways – Managers should aim to understand how fisheries production is driven either by bottom-up or top-down forcing and attempt to maintain diverse energy pathways to promote overall food web stability. Understand bottom-up forcing in South Atlantic fisheries production					
Action 5:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Compile time series and/or spatial maps of temperature, chlorophyll -a, freshwater flow, salinity, etc.	High	2019	Ongoing	NCDMF, NCWRC	NC Division of Marine Fisheries (NCDMF) has compiled salinity data, in collaboration with the NC Wildlife Resources Commission (NCWRC), and projected salinity contours under high- and low-flow conditions.
		2020	Ongoing	FWRI, NOAA, USF, SECOORA	SA EwE and Ecospace development process integrated time series of primary productivity using chlorophyll data which can be spatially represented. Ecospace will incorporate time series and/or spatial maps of temperature, chlorophyll -a, freshwater flow, salinity, etc.as available.
		2018	Ongoing	NOAA	NOAA is supporting research and compiling chlorophyll data in order to evaluate algal bloom occurrence. **10** https://www.noaa.gov/media-release/noaa-awards-116-million-for-harmful-algal-bloom-research

Table 1 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Food Web and Connectivity Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status, Partners and Associated Activities.

Action 5 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2018	Ongoing	NERs	National Estuarine Reserves have a system-wide monitoring program which monitors DO and other parameters and such a program could serve as a model for other agencies. https://coast.noaa.gov/digitalcoast/data/nerr.html
		2018	Ongoing	USFWS, Dominion Energy, APNEP, NCWRC and USACOE	Agencies have collaborated to fund continuous water quality monitoring stations on the Roanoke River in NC. https://www.waterqualitydata.us/provider/NWIS/USGS-NC/
		2018	Ongoing/ 2020	FL State Agencies	FL is collecting and compiling salinity data to update their Environmental Sensitivity Maps (ESI), which are revised every five years. https://www.floridagio.gov/datasets/myfwc::esi-habitat-regions-in-florida
		2019	2020	NC Agencies, USFWS	Updated ESI maps.
		2019	2020	GDNR	GA updated their ESI maps. **11** https://ocean.floridamarine.org/ACP/SAVACP/Maps/GA_ESI/Intro.pdf
		2019	Ongoing	FLDEP and Acoustic Networks	FL collecting and providing information on species distribution and change is using acoustic tagging with the Gulf and FL East Coast networks now sharing data and doing more suitability monitoring, mostly at the estuary level.
		2018	Ongoing	FLDEP, FL CZM, SECAR	The FLDEP through a Coastal Zone Management project, supports the Statewide Ecosystem Assessment of Coastal and Aquatic Resources (SECAR) program. https://floridadep.gov/SEACAR
		2019	2019/ Ongoing	NC DEQ, APNEP	Development of spatial SAV maps for NC https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/reports-publications-data/sav-mapping https://apnep.nc.gov/our-work/monitoring/submerged-aquatic-vegetation-monitoring

Chapter 2. South Atlantic Climate Variability and Fisheries

POLICY CONSIDERATIONS FOR SOUTH ATLANTIC CLIMATE VARIABILITY AND FISHERIES AND ESSENTIAL FISH HABITATS (Adopted December 2016)

Introduction to Policy Statement

This policy provides guidance for the SAFMC supporting the Council's interest in Ecosystem-Based Fishery Management (EBFM), in particular South Atlantic climate variability and fisheries and the protection of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (EFH- HAPCs). The policy assesses potential threats and impacts to managed species EFH and EFH-HAPCs and the South Atlantic ecosystem associated with climate variability or change and processes that could improve those resources or place them at risk.

Policy Considerations

The marine environment is constantly in flux and today, many parts of the ocean are changing quickly due to such factors as varying temperatures and salinities, fluctuating productivity, rising sea levels, ocean acidification and growing coastal populations. While the extent and types of changes occurring vary from region to region, these changes are a major driver of ecosystem dynamics and the impacts are already being observed by scientists, managers, and fishermen in the South Atlantic. Fish populations can react to changing ocean conditions. For example, as the ocean warms, many fish species are expanding their range or shifting their distributions toward the poles or into deep areas to find cooler waters. This policy addresses management of shifting species distributions, development of climate indicators, evaluation of tradeoffs, and scientific and management implications of new fisheries that develop as a result of climate variability.

Link to Complete Policy Statement:
http://safmc.net/download/SAFMC_HabitatPolicy_ClimateVariabilityFisheries_Final_Dec2016.pdf

The following are priority actions on how to best implement the policy statement and activities initiated or completed in the last two years as presented in Table 2 Policy to Action Excel spreadsheet for Climate Variability and Fisheries in the FEP II Implementation Plan.

Table 2. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: South Atlantic Climate Variability and Fisheries Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 2. South Atlantic Climate Variability and Fisheries					
Policy Component Addressed for Action 1: As species expand/shift their distributions due to changing ocean conditions and/or market demands, the SAFMC will proactively work to manage species that span multiple jurisdictions. Coordination with State Agencies (Document Species Distribution. Characterize annual and seasonal South Atlantic Ocean conditions.)					
Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Council develop and engage in a cooperative process with the MAFMC, ASMFC, GMFMC, and/or CFMC to explore ways to adaptively manage species that are or are expected to shift/expand their ranges.		2019	Planned Atlantic Coast Science Workshop and Initiation of Climate Scenario Planning	SAFMC, NEFMC, MAFMC, NOAA Fisheries NEFSC, SEFSC	In March of 2019 the SAFMC hosted the NEFMC and the MAFMC in Jekyll Island, Georgia for a coastwide discussion of shifting/range expanding species. **12** https://safmc.net/download/Briefing%20Book%20Council%20Mtg%20Dec%202018/TAB%2003%20-%20Habitat%20Protection%20Ecosystem/TAB03_A01_Species%20Moving%20North%20Presentation.pdf These efforts would entail coordination between Atlantic Coast Councils and NOAA Fisheries on science and research necessary to monitor and analyze climate related shifts in managed species and second a management focus to address cross jurisdictional issues. Initial planning was completed by NEFSC and SEFSC and participants were identified for an Atlantic Coast Science Workshop to advance these discussions, the effort has been delayed due to COVID-19. The Council was briefed at the Sept 2020 meeting on the Climate Change Scenario Planning efforts recently initiated,

Table 2 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: South Atlantic Climate Variability and Fisheries Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed by Action 2: NOAA or regional partners develop a priority list of climate indicators that likely track ecological, social, and economic trends and status and annual summaries documenting species likely to be influenced, and fisheries trends that appear to be due to changing ocean environmental conditions in the South Atlantic ecosystem. Develop ecological indicators, social indicators, and indicators of economic status and trends.					
Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Develop or select previously developed climate indicators and define triggers for when management action is needed.	High	2020	2020/Ongoing	NC Cabinet Agencies	NC in 2020 produced a Climate Science Report including sections on how to increase resilience, enhance recovery, and ways to reduce carbon footprints. Recommendations include buying more land for conservation, preserving the opportunity for marsh to migrate inland and reducing methane emissions from hog waste lagoons. **13** https://ncics.org/wp-content/uploads/2020/06/NC_Climate_Science_Report_FullReport_Final_revised_May2020.pdf
		2019	Update August 2020	USACOE	USACOE, with the involvement of NOAA, led an initiative, the South Atlantic Coastal Study https://www.sad.usace.army.mil/SACS/ to identify vulnerabilities and increase resilience, including SA EFH. https://sacs.maps.arcgis.com/apps/MapSeries/index.html?appid=c54beb5072a04632958f2373eb1151cf
		2018		SECOORA, SAFMC	SECOORA's Regional Coastal Ocean Observing System – Strategic Operational Plan for 2020-2025 provides, organizes, and supplements real-time and historic ocean data necessary to understand managed species **14** http://secoora.org/wp-content/uploads/2020/01/Strategic_RCOOS-Priorities_2019_FINAL.pdf

Table 2 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: South Atlantic Climate Variability and Fisheries Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed by Action 3: Climate change requires the consideration of tradeoffs. Council should consider tradeoffs. As appropriate, climate data and the effects of climate variability should be integrated into stock assessments. Climate impacts could also be a focus of the new proposed stock assessment research cycle.					
Action 3:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Council in cooperation with NOAA Fisheries, discusses and considers action to include climate impacts in the ABC Control Rule. Where appropriate, develop methodologies to include climate variability into stock assessments. This should include a best practices workshop including lessons from other regional or national climate experts.	High		Draft 2020 Workshop not held with no SA baseline available Possible item for CCC Habitat WG and enhanced focus and work with FSC	SAFMC, NOAA Fisheries SEFSC, SECAS, SSC, Ecospecies, and Academia.	NOAA EBFM Implementation Plan and development of the South Atlantic Climate Vulnerability Assessment **6** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A02_Burton_SAFish%20Climate%20Vulnerability%20Assessment.pdf and Ecosystem Status Report with drafts moving through inhouse review in the SEFSC **7** https://safmc.net/download/BB HabitatEcosystem AP Oct20/A03_Craig Ecosystem Status Report Oct20.pdf

Table 2 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: South Atlantic Climate Variability and Fisheries Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 3 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2018	Ongoing	St. Johns and South Florida WMDs	The South Florida Water Management District, and the St. Johns Water Management District, have both compiled data on water quality, water management, and SAV showing how things have evolved.
		2019	2019	FLDEP	FLDEP appointed a Chief Resilience Officer, and Chief Science Officer as the climate change presence.
		2019	Ongoing	FLDEP, FLFWC, USFWS Coastal Program, NOAA, St. Johns WMD, TNC, UF, FAP	FL developed a decision framework tool for living shorelines **15** http://www.tbrpc.org/wp-content/uploads/2019/11/Manual_Final_Oct2019.pdf and http://floridalivingshorelines.com/florida-sampler/
		2019	2020	ASMFC	ASMFC released an update to their living shorelines guidance document **16**(http://www.asmfc.org/files/Habitat/LivingShorelinesFactsheet2019.pdf and **17** http://www.asmfc.org/files/Habitat/LivingShorelinesCaseStudiesReferences2019.pdf

Table 2 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: South Atlantic Climate Variability and Fisheries Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 3 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2018	Completed 2020	All NC state agencies	NC governor released EO 80 in 2018, calling for NC agencies to address climate change and transition to a clean energy economy. As part of this, a Climate Risk Assessment and Resilience Plan was completed with multiple recommendations, many directed at actions to protect and restore coastal fish habitat to improve coastal resiliency. The recommendations will benefit fishery species. **18** https://files.nc.gov/ncdeq/climate-change/resilience-plan/2020-Climate-Risk-Assessment-and-Resilience-Plan.pdf
		2020	Due 2021	North Carolina Department of Environmental Quality, North Carolina Marine Fisheries Commission, North Carolina Coastal Resources Commission, and North Carolina Environmental Management Commission	NC's Coastal Habitat Protection Plan http://portal.ncdenr.org/web/mf/habitat/chpp/07-2020-chpp is being updated and includes several issue papers focused on assessing status of wetlands, SAV, and oysters and protecting and restoring them for fish habitat, as well as co-benefits such as carbon sequestration, flood and erosion control, which will make the coast more resilient with SLR and climate change. The CHPP biennial Implementation Plan 2018-2020 **19** http://portal.ncdenr.org/c/document_library/get_file?uuid=488d0b5e-6dea-46e3-a619-fcf2cefc7044&groupId=38337

Chapter 3. Marine Aquaculture

POLICY CONSIDERATIONS FOR THE INTERACTIONS BETWEEN ESSENTIAL FISH HABITATS AND MARINE AQUACULTURE (Adopted June 2014)

Introduction to Policy Statement

This policy provides the SAFMC guidance regarding interactions of marine aquaculture with Essential Fish Habitat (EFH) and Essential Fish Habitat - Habitat Areas of Particular Concern (EFH-HAPCs).

Policy Considerations

This policy addresses concerns related to the production of seafood and other non-seafood related products (*e.g.*, biofuels, ornamentals, bait, pharmaceuticals, and gemstones) by aquaculture, but does not specifically address issues related to stock enhancement. The policy assesses potential impacts, negative and positive, to EFH and EFH- HAPCs posed by activities related to marine aquaculture in offshore and coastal waters, riverine systems and adjacent wetland habitats, and the processes that could improve or place those resources at risk.

The recommendations presented apply to aquaculture activities that may impact EFH and EFH-HAPCs. Aquaculture activities have the potential to interact both positively and negatively with EFH and EFH-HAPCs when conducted in onshore, nearshore, and offshore environments.

Link to Complete Policy Statement:

http://cdn1.safmc.net/wp-content/uploads/2016/11/28102847/SAFMCAquaPolicyFinalJune14.pdf

The following are priority actions on how to best implement the policy statement as presented in Table 3 Policy to Action Excel spreadsheet for Marine Aquaculture in the FEP II Implementation Plan and activities initiated or completed in the last two years.

Table 3. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Marine Aquaculture Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 3. Marine Aquaculture
Policy Component Addressed for Action 1: Given the critical nature of proper siting, the permitting agency should require the applicant to provide all information necessary to thoroughly evaluate the suitability of potential aquaculture sites. If sufficient information is not provided in the time allotted by existing application review processes, the permitting agency should either deny the permit or hold the permit in abeyance until the required information is available.

Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Develop a non-fishing research priorities document specific to aquaculture in order to identify data gaps related to siting and species interactions with aquaculture facilities. Proper siting can prevent negative impacts of marine aquaculture on EFH. More information is needed on proper siting and potential species interactions with aquaculture facilities in the South Atlantic.	High	2018	Activities on aquaculture were not identified as a priority and on hold pending guidance.	SAFMC, NOAA, GMFMC, ASMFC,	The Council approved a motion to begin development of a South Atlantic Aquaculture FMP. Management under the Magnuson Stevens Act continues to be supported by the CCC, however litigation on implementation of the GMFMC plan was recently settled finding against the Gulf managing aquaculture under Magnuson Stevens Act. The Council has deferred work on aquaculture until guidance and clarification of the implication for management in the SA is provided by NOAA GC. However, the Council's Policy Statement does provide a review of potential impacts to managed species, their EFH, and standing guidance to avoid those impacts. No additional work has been done on aquaculture given the priority of issues to address.

Table 3 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Marine Aquaculture Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2:
Given the critical nature of proper siting, the permitting agency should require the applicant to provide all information necessary to thoroughly evaluate the suitability of potential aquaculture sites. If sufficient information is not provided in the time allotted by existing application review processes, the permitting agency should either deny the permit or hold the permit in abeyance until the required information is available.

Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Work with grant funding agencies to identify data gaps related to siting and species interactions with aquaculture facilities and prioritize projects to develop site-selection tools for applicants.	High	2018	Ongoing	NOAA, NMFS, EPA, SEAMAP, FWRI, ASMFC, State Agencies, SECOORA.	Ongoing coordination with partners enhanced and refined species information and GIS layers available from or linked to the Councils Habitat and Ecosystem Web Services hosted by FWRI necessary to evaluate future aquaculture efforts.

Table 3 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Marine Aquaculture Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 2 (cont.):	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
		2018	Ongoing	NCDMF, NCSU, NWS	NC worked with NCSU and NOAA used National Weather Service data https://www.weather.gov/serfc/ to enhance economic resilience by maintaining water quality which supports shellfish aquaculture harvest and avoids closures.
		2018	2018	NC Shellfish Mariculture Advisory Committee	NC Strategic Plan for Shellfish Mariculture: A Vison for 2030 was developed. **20** https://collaboratory.unc.edu/files/2019/01/NC-Strategic-Plan-for-Shellfish-Mariculture-Final-2018.pdf

Chapter 4. Submerged Aquatic Vegetation (SAV)

SAFMC POLICY FOR PROTECTION AND ENHANCEMENT OF ESTUARINE AND MARINE SUBMERGED AQUATIC VEGETATION (SAV) HABITAT (Adopted June 2014)

Introduction to Policy Statement

The SAFMC and the Habitat Advisory Panel considered the issue of the decline of estuarine and marine submerged aquatic vegetation (SAV) or seagrass habitat in Florida and North Carolina as it relates to Council habitat policy. Subsequently, the Council's Habitat Committee requested that the Habitat Advisory Panel develop the following policy statement to support Council efforts to protect and enhance habitat for managed species.

Policy Considerations

In the South Atlantic region, SAV is found primarily in the states of Florida and North Carolina where environmental conditions are more favorable than in South Carolina and Georgia. The distribution of SAV habitat is indicative of its importance to economically important fisheries: in North Carolina, total coverage is estimated to be 130,000 acres; in Florida, the nearshore seagrass coverage is estimated to be 2.2 million acres with an additional 2-3 million acres offshore in the Gulf of Mexico.

SAV is designated through Fishery Management Plans as Essential Fish Habitat for several federally managed species, including Penaeid shrimp, spiny lobster, snapper-grouper species, and cobia. It is also designated as habitat area of particular concern for snapper-grouper species and juvenile summer flounder. SAV is critically important to numerous state managed species, and a diverse assemblage of fauna that are prey to federally managed species; SAV provides valuable ecological and economic functions. Food and shelter afforded by SAV result in a complex and dynamic system that provides a primary nursery habitat for various organisms important both to the overall system ecology, to commercial and recreational fisheries, and to non-harvested fish, shellfish, manatees, and sea turtles. Using ecological services valuations, Florida seagrass ecosystems alone provide services worth more than $20 billion a year. This policy addresses monitoring and research needs, management actions that impact SAV, and education and enforcement to aid in fostering public understanding of the importance of the resource.

Link to Complete Policy Statement:

http://cdn1.safmc.net/wp-content/uploads/2016/11/28102847/SAFMCSAVPolFinalJune14.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 4 Policy to Action Excel spreadsheet for Submerged Aquatic Vegetation in the FEP II Implementation Plan.

Table 4. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Submerged Aquatic Vegetation Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 4. Submerged Aquatic Vegetation (SAV)					
Policy Component Addressed for Action 1: Monitoring and Research: Periodic mapping and monitoring of SAV in the region are required to determine how distribution has changed spatially over time, the progress toward the goal of a net resource gain, and what management actions are needed to reach established goals. Develop and standardize imagery acquisition and resource mapping protocols, with regional modification as necessary to achieve effective results.					
Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Council work with regional partners to:					
Review existing mapping efforts to determine the geographic extent and identify data gaps;		2018	Ongoing	FWRI, NCDMF	The Action was initiated in 2018 with review of SAFMC Habitat and Ecosystem Web Service layers. As states complete mapping the best and updated state GIS layers are added. Links to State programs detailed SAV habitat information, monitoring and state tools are included and updated as needed on FEP II Dashboard. States have conducted workshops to advance SAV monitoring however a Council sponsored one has yet to be conducted.
Review and summarize mapping protocols employed by various SAV monitoring programs and host a workshop to develop standard protocols and standardized indicators to assess SAV condition which can be monitored on a regular basis				SAFMC, FWC, FWRI, NCDMF, NOAA/NCCOS/CCFHR, APNEP, and FDEP	

Table 4 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Submerged Aquatic Vegetation Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 1 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2019	Ongoing	NCDEQ	APNEP's SAV Partnership is developing monitoring protocol for seagrass and low salinity grass beds. The NC Coastal Habitat Protection Plan (CHPP) http://portal.ncdenr.org/web/mf/habitat/chpp/07-2020-chpp has an issued paper on SAV, developed by a NCDEQ Team that identifies all mapping to date, and includes recommendations for mapping and monitoring. **21** http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=33714243&name=DLFE-143354.pdf
		2018	2018	ASMFC	ASMFC updated their SAV policy document and added an appendix documenting what all of the states are doing **22** http://www.asmfc.org/files/Habitat/HMS15_SAV_PolicyUpdate.pdf

Table 4 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Submerged Aquatic Vegetation Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2:

Monitoring and Research: Periodic mapping and monitoring of SAV in the region are required to determine how distribution has changed spatially over time, the progress toward the goal of a net resource gain, and what management actions are needed to reach established goals. Develop and standardize imagery acquisition and resource mapping protocols, with regional modification as necessary to achieve effective results. Evaluate water quality criteria needed to support SAV survival and growth and support policy making to manage quality and quantity of surface runoff.

Action 2:	Priority	Initiated	Status	Partner/s	Associated Activities
Council partners compile existing information on water quality requirements for SAV within specific water bodies and identify data gaps.	High	2020	Ongoing	State agencies, WMDs, SAFMC, NOAA, USFWS, and Academia, NCDEQ	The Action was initiated with NC and FL State and local partners collecting and compiling existing information on water quality requirements for SAV within specific water bodies. Data gaps identified and available as State efforts advance. For example NC is developing nutrient criteria for Albemarle Sound and Chowan River relating to SAV environmental needs **23** https://files.nc.gov/apnep/Wrenn_NCDP_91219.pdf

Table 4 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Submerged Aquatic Vegetation Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 3:

Monitoring and Research: Periodic mapping and monitoring of SAV in the region are required to determine how distribution has changed spatially over time, the progress toward the goal of a net resource gain, and what management actions are needed to reach established goals. Develop and standardize imagery acquisition and resource mapping protocols, with regional modification as necessary to achieve effective results. Evaluate water quality criteria needed to support SAV survival and growth and support policy making to manage quality and quantity of surface runoff.

Action 3:	Priority	Initiated	Status	Partner/s	Associated Activities
Regional partners in cooperation with Council, investigate potential effects of climate change and sea level rise on SAV communities within the SA coastal region.		2019	Ongoing	APNEP, NCDMF	NC is developing indicators, through the Albemarle Pamlico National Estuary Partnership (APNEP) and NCDMF. DMF funded research is assessing indicators of stress in SAV that may be related to climate change (temperature, salinity)
		2019	2020	APNEP, NCDMF, NCDOT	APNEP is coordinating with the N.C. Division of Marine Fisheries, N.C. Department of Transportation (N.C. DOT), and other partners to collect data for a third map of the Albemarle-Pamlico estuary's underwater grasses. https://apnep.nc.gov/our-work/monitoring/submerged-aquatic-vegetation-monitoring
		2018	Ongoing	APNEP, NCDMF, PEW	Technical workshop for SAV and water quality experts in NC, with the goal of discussing the connection between clean waters and SAV health for 2021 NC CHPP https://files.nc.gov/apnep/documents/files/SAV_Workshop_Summary_Report.pdf . **24**

Table 4 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Submerged Aquatic Vegetation Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 3 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2019	Draft 2020	NC Marine Fisheries, Environmental Management, and Coastal Resources Commissions	2021 iteration of the NC Coastal Habitat Protection Plan (CHPP) http://portal.ncdenr.org/web/mf/habitat/chpp/07-2020-chpp is underway.
		2018	Ongoing	FDEP	Florida's Seagrass Integrated Mapping and Monitoring Program (SIMM) is a statewide, collaborative program which facilitates the collection and publication of monitoring and mapping data for Florida seagrasses in order to assess the status and trends of this vital habitat and ecosystem. Links are included to updated Chapter reports for 2018 and 2019 http://myfwc.com/research/habitat/seagrasses/projects/active/simm/

Chapter 5. Beach Dredging/Re-nourishment and Large Scale Coastal Engineering

POLICIES FOR THE PROTECTION AND RESTORATION OF ESSENTIAL FISH HABITATS FROM BEACH DREDGING AND FILLING, BEACH RENOURISHMENT, AND LARGE-SCALE COASTAL ENGINEERING (Adopted March 2015)

Introduction to Policy Statement

This policy of the SAFMC establishes protection for essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) impacted by beach dredge-and-fill activities, and related large-scale coastal engineering projects (e.g., beach scraping). This policy does not supersede any other applicable state or federal policy or regulation pertaining to beach dredge-and-fill projects, but intended to complement existing policies or regulations for the benefit of protecting essential fish habitat managed by the SAFMC.

Policy Considerations

The policy assesses the threats to EFH potentially posed by activities related to the large-scale dredging and disposal of sediments in the coastal ocean and adjacent habitats, and the processes whereby those resources are placed at risk. The policy is designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law and addresses the information needed to effectively review these activities.

Link to Complete Policy Statement:

http://cdn1.safmc.net/wp-content/uploads/2016/11/28102847/SAFMCFinalEFHBeachPolicyMarch15.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 5 Policy to Action Excel spreadsheet for Beach Dredging/Re-nourishment and Large Scale Coastal Engineering in the FEP II Implementation Plan.

Table 5. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Beach Dredging/Re-nourishment and Large Scale Coastal Engineering Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 5. Beach Dredging/Re-nourishment and Large Scale Coastal Engineering
Policy Component Addressed for Action 1: For each project, a comprehensive environmental document should be prepared based on the best available information, and address detailed components specified in the Council Policy Statement. Defined areas of direct and indirect impact, using guidance provided in 40 CFR Section 1508.8 Effects. Baseline surveys designed with appropriate methodology to adequately document pre-project conditions for biological, physical and water resources in both direct and indirect impact areas Baseline surveys should follow the BACI (Before-After, Control-Impact) sampling framework (Stewart-Oaten 1986). A full range of alternatives, including alternatives that may minimize future need for additional nourishment activities (e.g., sand bypass). Impact assessment for each alternative using ecologically conservative assumptions and worst-case scenarios. A compensatory mitigation plan be developed A during-construction monitoring plan as deemed necessary for a specific project. A post- construction monitoring plan for biological, physical and water resources designed with appropriate methodology to adequately detect and document both direct and indirect project impacts.

Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
The Council provide policy statement with all the components to regulatory agencies and request that it be provided to applicants to increase awareness of and minimize impacts to Council- managed species and associated EFH.	Medium	2018	2020/ Ongoing	NOAA Fisheries, SAFMC, State Agencies, USACOE, and USFWS	The Action, was initiated with the notification of regional ecosystem partners of the revised FEP II Dashboard and EFH Section including all Council approved Policy Statements. Further notification was provided to action agencies and regional partners in a correspondence developed through the CCC Habitat Workgroup highlighting Council EFH mandates and policies and contacts. Council comments and policy was submitted to NC ACOE on Dredge windows in Oct 2020. **25** https://safmc.net/download/BB%20Habitat Ecosystem%20AP%20Oct20/A17_SAFMC Comment-COE_NCDredgeWindowEA.pdf

Table 5 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Beach Dredging/Re-nourishment and Large Scale Coastal Engineering Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2:
Fill material should match the sediment characteristics of the recipient beach as closely as possible.

Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Council to provide supporting information on grain size compatibility and ecological and economic benefits of using compatible sand to the USACOE and CZM agencies. Council recommend to permitting agencies that applicants perform sediment analyses (e.g., grain size, sorting, and mineralogy) to determine compatibility of dredged sediments with recipient beach sediments.	Medium	2019	Provided during previous EFH reviews	BOEM, SAFMC, NOAA Fisheries, State Agencies, and USACOE	NOAA EFH Consultation and commenting on all related dredge and fill associated with beach renourishment along South Atlantic beaches highlighting and supplementing recommendations in the Council's Policy pertaining to grain size.

Table 5 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Beach Dredging/Re-nourishment and Large Scale Coastal Engineering Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 3:

Dredging should be: (1) limited to bathymetric peaks (rather than depressions or level sea bottom) in areas characterized by strong currents and sand movement, in order to increase sediment infilling rates and decrease the duration of impacts to benthic habitats and (2) limited to the shallowest depths possible to minimize changes in wave energy and currents, thus reducing the likelihood of infilling with fine-grained sediments.

Action 3:	Priority	Initiated	Status	Partner/s	Associated Activities
Work with SEAMAP-SA to prioritize topographic mapping of ocean soft bottom and compile existing bathymetric and hydrologic information to develop bathymetric maps of ocean soft bottom habitat and identify gaps. Provide resulting maps to the regulatory agencies to so they can aid in minimizing long term habitat impacts from dredging. where information gaps exist.	Medium	2020	2020/ Ongoing With new map products SEAMAP Bottom Mapping Workgroup can be engaged	SEAMAP-SA, FWRI, SCDNR, BOEM, NOAA Fisheries, State Agencies, USACOE, SECOORA, Regional Conservation Blueprint and SECAS	BOEM conducted seafloor classification of sand resources mapped by BOEM **26** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A13c_Sand_Shoal_EFH_SAFMC%20Habitat_2020_Oct%20_final.pdf SCDNR and NOAA with the Folly Beach study results, will have the data on the loss in metric tons from the coastal food webs, due to beach filling**. 2** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A14b_Tweel_2018FollyNourishment_Monitoring.pdf Workgroup engaged as GIS developed and possible integration or accessible the SAFMC Digital Dashboard.
		2018	2020	BOEM	BOEM Regional Essential Fish Habitat Geospatial Assessment and Framework for Offshore Sand Features **27** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/13b_Vol0%20Front%20Matter%20and%20Executive%20Summary%20FINAL.pdf

Table 5 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Beach Dredging/Re-nourishment and Large Scale Coastal Engineering Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 4:

Reduce the impact of large-scale dredging and coastal engineering projects on EFH.

Action 4:	Priority	Initiated	Status	Partner/s	Associated Activities
The Council provide policy statement with all the required components to regulatory agencies reviewing large scale dredging and coastal engineering projects.	Medium	2018	2020	BOEM, NOAA Fisheries, SAFMC, State Agencies, USACOE, and USFWS	Notification of regional ecosystem partners of the revised FEP II Dashboard and EFH Section providing online access to all Council approved Policy Statements. Further notification was provided to action agencies and regional partners in 2020 in a correspondence highlighting Council EFH mandates and policies and contacts. The Council submitted comments/policy to NC US ACOE on EA Dredge windows **25** https://safmc.net/download/BB%20HabitatEcosystem%20AP%20Oct20/A17_SAFMCComment-COE_NCDredgeWindowEA.pdf The Habitat and Ecosystem Advisory Panel initiated development of a revised Beach Dredging/Re-nourishment and Large Scale Coastal Engineering policy statement for Council approval and distribution.

Chapter 6. Energy Exploration and Development

POLICY FOR THE PROTECTION AND RESTORATION OF ESSENTIAL FISH HABITATS FROM ENERGY EXPLORATION AND DEVELOPMENT ACTIVITIES (Adopted December 2015)

Introduction to Policy Statement

This policy provides the SAFMC guidance regarding the protection of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (EFH-HAPCs) from impacts associated with energy exploration and development activities. This policy also provides guidance regarding mitigation of those impacts, including avoidance, minimization and compensatory mitigation.

Policy Considerations

The types of activities within the scope of this policy include wind; oil and gas; methane hydrate mining; estuarine and marine hydrokinetic; liquefied natural gas (LNG) regasification, pipelines, and offshore and on-shore facilities; and onshore power plants. The findings assess potential impacts to EFH and EFH-HAPCs posed by activities related to energy exploration and development in offshore and coastal waters, riverine systems and adjacent wetland habitats, and the processes that could improve those resources or place them at risk. The policies and recommendations are designed to avoid and minimize impacts and optimize benefits from these activities.

Link to Complete Policy Statement:

http://cdn1.safmc.net/wp-content/uploads/2016/11/28102846/SAFMCEnergyPolicyDec1415.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 6 Policy to Action Excel spreadsheet for Energy Exploration and Development in the FEP II Implementation Plan.

Table 6. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 6. Energy Exploration and Development
Policy Component Addressed for Action 1: Projects should avoid, minimize, and – where possible – offset damage to EFH, EFH-HAPCs, and SHAs. This should be accomplished, in part, by integrating the best available and least damaging technologies into the project design.

Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
The Council provides EED policy with all components to the regulatory agencies to ensure project compatibility with the SAFMC policy and cooperate with regional partners to develop a best management practices document in order to reduce impacts to fish, fish habitat, and fisheries.	High	2018	2019/ 2020 Policy has guidance but separate BMP doc. not yet developed	BOEM, SAFMC, NOAA Fisheries, USACOE, NOAA Fisheries, State Agencies.	The Council provides the standing EED policy online and to the regulatory agencies when commenting on energy related activities. Council comments were provided on: • The 2019–2024 National OCS Oil and Gas Leasing Draft Proposed Program and Programmatic EIS including SAFMC Position on Energy Development and Seismic Testing provided to Secretary Zinke **28** • Federal Consistency Review- SC OCRM Coastal Zone Consistency Section the Federal Permit Application by WesternGeco, LLC to conduct seismic exploration activities in the federal waters of the Atlantic Ocean **29**

Table 6 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 1 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2018	2020/ Ongoing Info. Compiled will be available for use in a BMP doc.	Avangrid	Avangrid efforts to fully coordinate with fisheries interests on the Kitty Hawk Wind project and hired former MAFMC Chair Rick Robins as a liaison to fisheries interests. Site Assessment plan provided: https://safmc.net/download/Briefing%20Book%20Habitat%20AP%20April%202020/A6_Avangrid%20Kitty%20Hawk%20Final%20SAP_25NOV19%20-%20PUBLIC.pdf **30**
		2020	2020 Information developed or compiled will be available for use in a BMP doc.	NOAA Fisheries HCD	Essential Fish Habitat Emergency Consultations in the Southeast https://www.fisheries.noaa.gov/southeast/habitat-conservation/essential-fish-habitat-emergency-consultations-southeast EFH Best Management Practices (EFH BMPs) for Certain Response Activities to Accidental Discharges of Oil and Other Hazardous Materials have been prepared by NOAA Fisheries, Southeast Region, HCD to serve as EFH conservation recommendations to minimize impacts to EFH for certain, frequently utilized, emergency response activities approved by U.S. Coast Guard (USCG) and/or Environmental Protection Agency (EPA). https://www.fisheries.noaa.gov/webdam/download/109861821 **31**

Table 6 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2: Projects should avoid intersection or overlap with Allowable Fishing Areas within the Deepwater Coral HAPCs.					
Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
The Council provide maps of priority fishing areas, MPAs, and EFH-HAPC to be avoided in federal and state waters for energy exploration and development activities.	High	2018	2019/ 2020 Ongoing	BOEM, SAFMC, NOAA Fisheries, USACOE, NOAA Fisheries, State Agencies. SCDNR, SCDHEC	The Council provides maps and/or links to the Habitat and Ecosystem Webservices highlighting Council managed areas, EFH and EFH-HAPC to be avoided to reduce impacts to fish, fish habitat, and fisheries. Staff coordinated with SC OCRM and provided GIS during their CZM Consistency Review of the Federal Permit Application by WesternGeco, LLC to conduct seismic exploration activities in the federal waters of the Atlantic Ocean. SC OCRM found testing to be inconsistent with CZM. **29**
		2018	2020	NCDEQ, NCDMF	This information and literature on the impacts of seismic testing to marine organisms was provided to multiple seismic testing companies during the consistency process. NCDCM found projects to be inconsistent with CAMA, and was appealed in court. The 2020 ban on oil exploration in the South Atlantic states has stopped any additional seismic surveys from occurring. NCDMF was provided Council position and standing policy as noted in Action 1.

Table 6 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 3:

Projects should comply with existing standards and requirements regulating domestic and international transportation of energy products including regulated waste disposal and emissions which are intended to minimize negative impacts on and preserve the quality of the marine environment.

Action 3:	Priority	Initiated	Status	Partner/s	Associated Activities
In Council review and comment on projects, request companies associated with energy development to fund compliance monitoring positions that will inspect and assess if requirements are being adhered to.	High	2018	2019/ 2020 Ongoing	BOEM, SAFMC, NOAA Fisheries, USACOE, NOAA Fisheries, State Agencies.	The Council provides the standing EED policy which supports compliance monitoring online and to the regulatory agencies when commenting on energy related activities. Council comments were provided on: • The 2019–2024 National OCS Oil and Gas Leasing Draft Proposed Program and Programmatic EIS including SAFMC Position on Energy Development and Seismic Testing provided to Secretary Zinke **28** • Federal Consistency Review- SC OCRM Coastal Zone Consistency Section the Federal Permit Application by WesternGeco, LLC to conduct seismic exploration activities in the federal waters of the Atlantic Ocean **29**

Table 6 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 4:

EFH Review, Administrative Policies, Licensing Policies and Best Management Practices: Projects requiring expanded EFH consultation should provide a full range of alternatives, along with assessments of the relative impacts of each on each type of EFH, EFH-HAPC, and SHAs.

Expanded EFH consultations allow NMFS and a Federal action agency the maximum

opportunity to work together in the review of an activity's impact on EFH and the development of EFH conservation recommendations. Expanded consultation procedures must be used for Federal actions that would result in substantial adverse effects to EFH. Federal action agencies are encouraged to contact NMFS at the earliest opportunity to discuss whether the adverse effect of a proposed action makes expanded consultation appropriate.

Action 4:	Priority	Initiated	Status	Partner/s	Associated Activities
Provide information to federal agencies on fish, habitat, and fisheries data available on the SAFMC GIS portal that can be used in the EFH consultation process as a tool for evaluating alternatives.	High	2018	Ongoing	BOEM, SAFMC, NOAA Fisheries, USACOE, NOAA Fisheries, State Agencies.	The Council provides maps highlighting Council managed areas, EFH and EFH-HAPC to be avoided to the regulatory agencies as needed and cooperate with regional partners by providing online access to updated fish, fish habitat, and fisheries GIS layers and partner services through the Councils Digital Dashboard https://ocean.floridamarine.org/safmc_dashboard/
		2018	Ongoing	NCDEQ, NCDCM	NC is mapping wetland habitats and as completed will be included in Council Habitat and Ecosystem Web Service supporting refined EFH consultation. http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=33714243&name=DLFE-143354.pdf

Table 6 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Energy Exploration and Development Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 5:

EFH Review, Administrative Policies, Licensing Policies and Best Management Practices: Impact evaluations should include quantitative assessments for each habitat based on recent scientific studies, habitat characterizations, and the best available information. All EFH assessments should be based upon the best available science, be conservative, and follow precautionary principles as developed for various Federal and State policies. EFH Assessments are produced with information gathered from the best available technologies to map and characterize project sites. The methods used for habitat mapping and characterization work should reflect input from resource trustees and be performed with experienced personnel.

Action 5:	Priority	Initiated	Status	Partner/s	Associated Activities
Work with federal agencies to identify information gaps and prioritize research needs and develop a non-fishing research and monitoring document in order to identify data gaps and monitoring protocols related to siting and species interactions with offshore energy facilities.	High	2018	Ongoing	Habitat and Ecosystem Advisory Panel, BOEM, NOAA NMFS, USACOE.SCDHEC, SCDNR	The Habitat and Ecosystem Advisory Panel receives briefings on research planning by BOEM, NOAA and other federal agencies and during session providing input on information gaps and priority research needs to be addressed in agencies research and monitoring documents documenting potential habitat, species and fishery interactions with offshore energy development. The Council provided input on the BOEM Path Forward for Renewable Energy. **33** Creation and continued development of NOAA/BOEM Marine Cadastre https://marinecadastre.gov/ project as a database for energy development. Links to BOEM and other State systems are provided through the Council Habitat and Ecosystem Digital Dashboard and Web Services . https://ocean.floridamarine.org/safmc_dashboard/

Chapter 7. Alterations to Riverine, Estuarine, and Nearshore Flows

POLICIES FOR THE PROTECTION AND RESTORATION OF ESSENTIAL FISH HABITATS FROM ALTERATIONS TO RIVERINE, ESTUARINE, AND NEARSHORE FLOWS (Adopted June 2014)

Introduction to Policy Statement

This policy establishes the SAFMC's guidance regarding protection of the essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) associated with alterations of riverine, estuarine and nearshore flows. Such hydrologic alterations occur through activities such as dam operations, water supply and irrigation withdrawals, and other modifications to the normative hydrograph.

Policy Considerations

The policy assesses the threats to EFH potentially posed by activities related to the alteration of flows in southeast rivers, estuaries and nearshore ocean habitats, and the processes whereby those resources are placed at risk. The policies are designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law. The policy addresses scheduling of construction activities, siting of intakes, and maintenance and monitoring activities.

Link to Complete Policy Statement: http://cdn1.safmc.net/wp-content/uploads/2016/11/28102846/SAFMCInstreamFlowPolFinalJune14.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 7 Policy to Action Excel spreadsheet for Alterations to Estuarine, Riverine and Nearshore Flows in the FEP II Implementation Plan.

Table 7. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Alterations to Estuarine, Riverine and Nearshore Flows Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 7. Alterations to Riverine, Estuarine, and Nearshore Flows					
Policy Component Addressed for Action 1: Projects should avoid, minimize and where possible offset damage to EFH and EFH-HAPCs, diadromous fishes, state and federally-listed species, Federal critical habitat, and State Critical Habitat Areas (CHAs).					
Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Council to cooperate with federal, state, and university scientists characterizing baseline natural flows and flow regimes for each South Atlantic river basins, estuary and nearshore habitats natural function necessary to support healthy ecosystem function and fishery production.	High	2018	2020 Ongoing	NC DMF, APNEP, SALCC/SECAS, ASMFC, USGS, USFWS, NOAA, State Agencies, Academia, SAFMC NCWRC, USFWS, USACOE, TNC, NC and VA fish and wildlife agencies	Regional coordination has occurred with membership on SARP highlight state programs and has developed an instream flow protection policy https://southeastaquatics.net/sarps-programs/sifn/southeastern-state-instream-flow-programs/instream-flow-protection-policy-document The developed ecological flow regime for the Roanoke River (quasi-run-of-river regime) will inform the Council, state and federal partners for use in policy guidance https://www.usgs.gov/centers/sa-water/science/roanoke-river-water-quality-monitoring-and-modeling?qt-science_center_objects=0#qt-science_center_objects
Provide resulting information to appropriate federal and state agencies, as well as applicants.		2020	Not reviewed/ provided	USFWS, NOAA, State Agencies,	

Table 7 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Alterations to Estuarine, Riverine and Nearshore Flows Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2:

- Projects should:
- Provide detailed analyses of a full range of alternatives, along with assessments of the relative impacts of each on each type of EFH, EFH-HAPC, diadromous fishes, state and federally-listed species, Federal critical habitat, and CHAs.
- Avoid impacts on EFH, EFH-HAPCs, diadromous fishes, state and federally-listed species, Federal critical habitat, and CHAs that are shown to be avoidable through the alternatives analysis, and minimize impacts that are not.
- Include assessments of potential unavoidable damage to EFH and other marine resources.
- Be conditioned on the avoidance of impacts, and the minimization of unavoidable impacts. Compensatory mitigation should be required for all unavoidable impacts
- Include baseline and project-related monitoring be adequate to document pre-project conditions and impacts
- All assessments should be based upon the best available science and take into account the cumulative impacts associated with other projects in the same southeast watershed.
- Meet state and Federal water quality standards.

Action 2:	Priority	Initiated	Status	Partner/s	Associated Activities
Council in cooperation with NOAA Fisheries provide the policy with all the components to appropriate federal and state agencies, as well as applicants to support compliance with the SAFMC policy.	Medium	2018	Ongoing	SAFMC, NOAA, USFWS	The policy statement is available online through the EFH Section of the FEP II **34** Dashboard https://safmc.net/wp-content/uploads/2016/06/SAFMCInstreamFlowPolFinalJune14.pdf NOAA Fisheries HCD expands and highlights recommendations to reduce impacts on EFH for Council managed species in EFH Consultation process.

Table 7 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Alterations to Estuarine, Riverine and Nearshore Flows Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 3:	Priority	Initiated	Status	Partner/s	Associated Activities
NOAA Fisheries in cooperation with the Council, develop a list of regionally specific requirements or Best Management Practices for flow-altering projects that can potentially impact EFH or other resources and support scheduling projects to not coincide with spawning migrations or early development of sensitive species.	High	2019	Not complete Update with future Policy revision to address climate	SAFMC, NOAA Fisheries, USFWS, State Agencies.	The policy statement is available online through the EFH Section of the FEP II Dashboard. NOAA Fisheries HCD highlights measures in the policy and expands on requirements provided to refine in EFH Consultation process.

Policy Component Addressed for Action 4:

Components of the natural flow regime should be altered as little as possible. Although achieving a natural hydrograph in its entirety may not be possible, restoration of some of the natural flow regime components can restore ecosystem elements that would be lost or reduced as a consequence of flow regulation.

Action 4:	Priority	Initiated	Status	Partner/s	Associated Activities
Council provide the policy with all the required components to the appropriate federal and state regulatory agencies to emphasize the importance of selecting the alternative that retains as much of the natural flow regime as possible.	High	2019	2020	SAFMC, NOAA Fisheries, USFWS, SARP, Instream Flow Network, and SECAS/SALCC.	The policy statement is available online through the EFH Section of the FEP II Dashboard.

Table 7 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Alterations to Estuarine, Riverine and Nearshore Flows Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 4:	Priority	Initiated	Status	Partner/s	Associated Activities
		2019	Ongoing Developed data and guidance will be available to enhance future policy update	TNC, USACOE	TNC and the Corps in NC are developing recommendations on ecological flows. **35** https://capefearriverpartnership.com/wp-content/uploads/2018/03/The-Sustainable-Rivers-Program-overview-for-the-Cape-Fear_Julie.pdf https://deq.nc.gov/about/divisions/water-resources/water-planning/basin-planning/ecological-flows

Chapter 8. Non-Native and Invasive Species

POLICIES FOR THE PROTECTION OF SOUTH ATLANTIC MARINE AND ESTUARINE ECOSYSTEMS FROM NON-NATIVE AND INVASIVE SPECIES (Adopted June 2014)

Introduction to Policy Statement

This policy establishes the SAFMC's guidance regarding protection of South Atlantic estuarine ecosystems from potential impacts associated with invasive species.

Policy Considerations

The policy assesses potential impacts to the South Atlantic's marine and estuarine ecosystems posed by invasion of non-native species and the processes which could place those resources at risk. In adhering to a precautionary approach to management, the SAFMC establishes in this document policies and recommendations designed to avoid, minimize, and offset potential impacts to South Atlantic estuarine ecosystems. The policy addresses removal of invasive species, coordination with national and regional bodies on invasive species efforts, and activities that might result in non-native species introduction.

Link to Complete Policy Statement: http://cdn1.safmc.net/wp-content/uploads/2016/11/28102846/SAFMCMarEstInvasPolFinalJune14.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 8 Policy to Action Excel spreadsheet for Non-Native and Invasive Species in the FEP II Implementation Plan.

Table 8. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Non-Native and Invasive Species Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 8. Non-Native and Invasive Species

Policy Component Addressed for Action 1:

The Council encourages the development of novel gears (other than those prohibited by the Council, such as fish traps) that effectively remove invasive species but do not compromise the integrity of South Atlantic habitats and ecosystems. The Council encourages consulting with appropriate law enforcement agencies to ensure compliance with existing regulations and to address possible enforceability challenges.

Action 1:	Priority	Initiated	Status	Partner/s	Associated Activities
Give consideration to EFP applications for the development of novel gears that target non- native and invasive species. Provide support for these applications, as merited.	Medium	2018	2019 Ongoing	SAFMC, NOAA Fisheries	NOAA has provided EFPs with input from the Council for lionfish gear while avoiding habitat damage or compromising the snapper grouper fish trap prohibition. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/LOA_and_EFP/2018/Lionfish/Lionfish%20EFP.html
		2018	2020	NC, SC, GA, FL	State Aquatic Non-Native Species (ANS) plans under development or completed. https://georgiawildlife.com/ans https://www.dnr.sc.gov/water/envaff/aquatic/index.html
		2018	Ongoing	GSARP, SCDNR	The Gulf and South Atlantic Regional Panel on Aquatic Invasive Species helps to address the need for coordination in the southeast US. https://www.gsarp.org/

Table 8 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Non-Native and Invasive Species Sheet presenting Action

Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2: The Council strongly suggests inspection and thorough cleaning of surfaces prior to placement of reef building materials and Fish Attracting Devices (FAD). The potential risk of inadvertently expanding the range of a non-native species through transport or establishment of new habitats should be carefully considered.					
Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Provide NOAA Fisheries HCD with the Non-Native and Invasive Policy to develop and provide a condition that requires the inspection and thorough cleaning of surfaces prior to placement of reef building materials or FADs for HCD to put forward in their comments, and also provide HCD with an SAFMC contact for them to coordinate with if needed.	High	2020	Sent 2020	SAFMC, NOAA Fisheries HCD.	The policy statement is available online through the EFH Section of the FEP II **36** Dashboard https://safmc.net/wp-content/uploads/2016/06/SAFMCMarEstInvasPolFinalJune14.pdf. NOAA Fisheries HCD highlights and expands on requirements provided in the policy during the EFH Consultation process when Non-Native and Invasive species are considered.
Policy Component Addressed for Action 3: The Council supports its regional partners in their endeavor to promulgate regulations for ballast water and their efforts toward research and development to advance treatment technology for ballast water.					
Action 3:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Evaluate annual level of ballast water from vessels transiting the South Atlantic region.	High	2020	Not addressed	SAFMC, NOAA Fisheries HCD, FWRI, NOAA NOS.	The Action is being initiated in 2020.

Table 8 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Non-Native and Invasive Species Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 4:

The Council supports programs to control invasive species' populations in areas for eradication (isolated populations) is possible. The Council supports harvest, eradication, and/or removal strategies that do not impact populations of managed species or their habitats.

Action 4:	Priority	Initiated	Status	Partner/s	Associated Activities
Provide support as opportunities present themselves (whether it be with a letter from the Council or voicing support in a meeting) for invasive species control programs and strategies in areas of high ecological/economic importance that do not impacts populations of managed species or their habitats.	Medium	2018	Ongoing	SAFMC, NOAA Fisheries HCD, FWC, SARP, SA EwE Modeling Team/FWRI, USGS	Council support for lionfish removal efforts in the Keys at multiple areas and NOAA Fisheries consideration and review of experimental gear to remove them directly addresses this action. Monitoring of lionfish is occurring in Florida State waters and as part of the overall SERFS (SEAMAP/MARMAP/SEFIS) fishery independent survey efforts. https://www.gsarp.org/mdocs-posts/is-the-lionfish-invasion-coming-to-an-end-a-case-study-from-the-southeast-united-states/
		2018	Ongoing	NOAA Fisheries SERO	NOAA has been tracking and avoiding compromising the fish trap prohibition. https://www.fisheries.noaa.gov/southeast/south-atlantic-exempted-fishing-permits-efp
		2019	2019	FL, USCG	Implemented new ballast water requirements which are intended to address spread of invasive species. **37** https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/MSIB/2019/MSIB_007_19.pdf?ver=2019-09-06-151207-643

Chapter 9. Artificial Reefs

POLICY CONSIDERATIONS FOR DEVELOPMENT OF ARTIFICIAL REEFS IN THE SOUTH ATLANTIC REGION AND PROTECTION OF ESSENTIAL FISH HABITAT (September 2017)

Introduction to Policy Statement

This policy establishes the SAFMC guidance regarding protection and mitigation of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (EFH-HAPCs) related to artificial reef development, placement, and maintenance.

Policy Considerations

In addition to serving as EFH, this policy highlights that the Council has designated artificial reefs Special Management Zones (SMZs) as EFH-HAPCs. For the purposes of policy, the findings assess potential threats and impacts to managed species EFH and EFH-HAPCs and the South Atlantic ecosystem associated with artificial reefs and processes that could improve those resources or place them at risk. The policy addresses issues related to siting, design and construction, as well as monitoring and assessment activities.

Link to Complete Policy Statement:
http://safmc.net/download/SAFMCArtReefEFHPolicyStatementSept17.pdf

The following are priority actions on how to best implement the policy statement that can be initiated in the next two years as presented in Table 9 Policy to Action Excel spreadsheet for Artificial Reefs in the FEP II Implementation Plan.

Table 9. FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Artificial Reefs Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Chapter 9. Artificial Reefs					
Policy Component Addressed for Action 1: Uses: Artificial reefs can be used to support fisheries management by providing a more standardized comparison for scientific investigations.					
Action 1:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Prioritize research needs and explore mechanisms (including designated research areas) to support, coordinate and accomplish research necessary to answer questions related to using artificial reefs in ways that better support fisheries management.	High	2018	SMP Review	State Agencies, ASMFC Artificial Reef Committee, SAFMC, USACOE, NOAA	Review of Charleston Deepwater Artificial Reef MPA and Spawning Special Management Zones addressing needs identified in System Management Plans **38** https://safmc.net/wp-content/uploads/2017/07/SystemManagementPlanMPAsMay2016.pdf https://safmc.net/wp-content/uploads/2017/07/SystemManagementPlan_SpawnSMZMay2016.pdf
		2019	2020	State Agencies, SAFMC, USACOE, NOAA	A new Council Web Service for the Digital Dashboard the South Atlantic Artificial Reefs Web Application was created (http://myfwc.maps.arcgis.com/apps/webappviewer/index.html?id=f3c6ac59ee5f49e59f1ae5c96c5bc76b) to present regional artificial reef information including GIS, imagery and video provided by the state artificial reef programs. Site will be expanded to highlight research needs.

Table 9 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Artificial Reefs Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 2: Construction- The SAFMC supports the use of environmentally-safe, long-lasting materials for reef construction, which are stable in their location and avoid any potential danger to other species (e.g., sea turtles).					
Action 2:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
Review Federal management and operation plans for artificial reefs to determine if they are up to date and meet the guidelines put forth by ASMFC Artificial Reef Committee and as permitted by USCOE, and update as necessary. Encourage state partners to do the same.	High	2018		ASMFC Artificial Reef Committee, State Agencies, USACOE, USCG, NOAA PRD, SAFMC.	The Action is ongoing as states update their programs and ASMFC reviews and updates guidance documents

Table 9 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Artificial Reefs Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 5:					
Mitigation: There should be mitigation measures specified if the function of an artificial reef is lost. Artificial reefs can be used to mitigate for damage to natural reefs and for damage to artificial reefs. However, natural (and to an extent artificial) reef habitat is not perfectly replaceable, so caution should be taken to reduce damage to natural and artificial reefs when possible.					
Action 5:	**Priority**	**Initiated**	**Status**	**Partner/s**	**Associated Activities**
SAFMC and NOAA Fisheries also encourage use of artificial reefs as mitigation for offshore dredging operations - whether it is permitting for sand mining or creating offshore dredge spoil areas.	High	2019	Ongoing	State Fishery Agencies and Ports, ASMFC Artificial Reef Committee, SAFMC, USACOE, NOAA Fisheries	Coordination with state agencies and through conservation recommendations developed by NOAA Fisheries in ongoing EFH consultation which encourages use of artificial reefs as mitigation for offshore dredging operations. **39** https://www.frontiersin.org/articles/10.3389/fmars.2020.00282/full Supports the value of artificial reefs for fish enhancement which is the basis for use in mitigation. Coordinated with SC State Port in stakeholder discussions on use of material to create reef berms off Charleston from material extracted from harbor deepening.

Table 9 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Artificial Reefs Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Policy Component Addressed for Action 6:

Other Priority Needs Long-term, multi-year standardized monitoring of artificial reefs and their communities, with the necessary long-term funding to provide multi-year trends in reef fish productivity and allow valid future comparisons of temporal and spatial data.

Action 6:	Priority	Initiated	Status	Partner/s	Associated Activities
Cooperate with State partners to secure funding for programs to support long-term, multi-year standardized monitoring of artificial reefs and their communities, with the necessary long-term funding to provide multi-year trends in reef fish productivity and allow valid future comparisons of temporal and spatial data.	High	2018	Ongoing	SAFMC, State Agencies, ASMFC.	The Action, was initiated with mapping and initial monitoring of Charleston Deep Artificial Reef and seeking resources to address priorities in the System Management Plan. In addition, with the designation of two Artificial reefs off SC as Spawning SMZs, mapping and research conducted to date was provided and new efforts were initiated by the state and as funds have been available through NOAA Fisheries to address needs identified in System Management Plans. **40** https://safmc.net/wp-content/uploads/2017/07/SystemManagementPlan_SpawnSMZMay2016.pdf **41** https://safmc.net/wp-content/uploads/2017/07/SystemManagementPlanMPAsMay2016.pdf

Table 9 (cont.). FEP II Two Year Roadmap Policy to Action Excel spreadsheet: Artificial Reefs Sheet presenting Action Items, Policy Component Addressed, Priority, Initiated, Status Partners and Associated Activities.

Action 6 (cont.):	Priority	Initiated	Status	Partner/s	Associated Activities
		2019	Ongoing	State Artificial Reef Programs, ASMFC Artificial Reef Committee, NOAA Fisheries	ASMFC is developing a revised artificial reef guidance document. **42** https://www.gsmfc.org/publications/GSMFC%20Number%20121.pdf
		2018	2020	State Artificial Reef Programs, ASMFC Artificial Reef Committee, NOAA Fisheries	States initiated an update of the 1988 reef profile document **43** https://rucore.libraries.rutgers.edu/rutgers-lib/16677/PDF/1/play/ to be completed in 2020.
		2018	Ongoing	NCDEQ	NCDENR is conducting ongoing monitoring on the oyster sanctuaries. **44** https://www.nccoast.org/wp-content/uploads/2019/10/State-of-the-Oyster-2018-web-FINAL.pdf **45** https://ncoysters.org/wp-content/uploads/2020/06/Oyster-Blueprint-Habitat-Mgt-Draft-Strategies.pdf http://portal.ncdenr.org/web/mf/habitat/enhancement/oyster-sanctuaries
		2018	Ongoing	NCDEQ	NC has a five-year Artificial Reef plan which includes research as a priority. **46** 48http://portal.ncdenr.org/c/document_library/get_file?uuid=d7dddb18-f546-48c8-98d1-4cc43016ed2a&groupId=38337