

No.	Action	Agencies Involved <sup>1</sup>	Issue
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<b>GOAL 1. IMPROVE EFFECTIVE OF EXISTING RULES AND PROGRAMS PROTECTING COASTAL FISH HABITAT</b>			
<b>Rec. 1.1. Ensure compliance with Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and Marine Fisheries Commission (MFC) rules and permits.</b>			
1.1.1	Cross train Marine Patrol officers to take note of and report violations of EMC rules and permits in Coastal Waters to appropriate agencies.	DCM, DMF	
1.1.2	The Department will seek funding for additional compliance positions in appropriate programs <a href="#">and regulatory divisions will continue to educate the public on rules and the ecological importance and need for compliance.</a>	DEQ	
<b>Rec. 1.2a. Coordinate and enhance monitoring of water quality, habitat, and fisheries resources (including data management) from headwaters to the nearshore ocean.</b>			
1.2a.1	Enhance dependable water quality monitoring by investing in Neuse Estuary MODMON and FerryMon.	DEQ	
1.2a.2	The Department, through the APNEP, will develop a comprehensive monitoring plan for the estuarine system <a href="#">within the APNEP region.</a>	APNEP, DMF	M
<b>Rec. 1.2b. Coordinate and enhance assessment and monitoring of effectiveness of rules established to protect coastal habitats.</b>			
1.2b.1	Investigate development of performance criteria for measuring success of management actions (eg. stormwater rules, BMPs).	DEMRL, DWR, DCM, DMF, APNEP	M
<b>Rec. 1.3. Enhance and expand educational outreach on the value of fish habitat, threats from land use and other activities, and explanations of management measures and challenges.</b>			
1.3.1	Conduct outreach to educate citizens about DWR's Neuse and Tar-Pamlico riparian buffer rules and 401 Water Quality Certification program.	DWR, APNEP	
1.3.2	<a href="#">Promote habitat conservation by incorporating habitat information into division outreach efforts, including, 1) creating interactive materials for events highlighting life history, habitat use, and threats of species; 2) setting up fish habitat aquarium displays for longer events; 3) seeking funding for additional displays</a>	DMF, DCM, Sea Grant	
1.3.4	Educate traditional economic interests (eg. developers) on the impact of stormwater <a href="#">and new options included in the stormwater design manual;</a> implement workshops for engineers and consultants on stormwater management buffers, and 401 Water Quality Certifications.	DWR, DEMRL, WRRI	S

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1.3.5	Provide information to focus students in K-12 understanding the biodiversity of lakes, streams, and estuaries.	DWR, APNEP, DSWC	
<b>Rec. 1.4. Continue to coordinate among commissions and agencies on coastal habitat management issues.</b>			
1.4.1	The Department will hold quarterly meetings on proposed projects and enforcement cases that are or may be subject to the permitting or enforcement jurisdiction of the programs of more than one division and invite other state and federal agencies to participate as appropriate.	DCM, DEQ	
1.4.2	Identify any Primary Nursery Areas (PNA) that are not currently designated as High Quality Waters (HQW), and work to reclassify to HQW.	DMF, DWR	
<b>Rec. 1.6. Enhance management of invasive species with existing programs. Monitor and track status in affected waterbodies.</b>			
1.6.1* *	Assess invasive SAV in the APNEP region annually and continue to coordinate invasive SAV treatment with DMF and APNEP.	DWR, APNEP, DMF	M
1.6.2	Monitor and track invasive catfish through an information cooperative identifying data sources, current research, and research needs.	DMF	M
<b>GOAL 2. IDENTIFY AND DELINEATE STRATEGIC COASTAL HABITATS</b>			
<b>Rec. 2.1a. Support assessments to classify habitat value and condition by coordinating, completing, and maintaining baseline habitat mapping (including seagrass, shell bottom, shoreline, and other bottom types) using the most appropriate technology.</b>			
2.1a.1	Map SAV on five year cycles.	APNEP, DMF	M
2.1a.2	Establish sentinel sites in the five established SAV regions and monitor annually.	APNEP, DMF	M
2.1a.3	Seek dedicated funding for the state SAV mapping program.	DEQ, DMF, APNEP	M
<b>Recommendation 2.1b. Support assessments to classify habitat value and condition by selectively monitoring the condition and status of those habitats.</b>			
2.1b.1	Facilitate mapping of deep (>15 ft) estuarine bottoms, starting with lower Neuse River. To do this, seek funding to hire staff to sidescan key areas in Pamlico Sound and post-process the data.	DMF	O
2.1b.2	Modify shellfish mapping program to establish and monitor sentinel sites for shell bottom habitat condition. Develop shell bottom metrics to monitor.	DMF	M

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2.1b.3	Develop indicator metrics for the six fish habitats; data to be used to establish habitat thresholds and conduct habitat assessments.	<b>DMF, APNEP,</b> DWR, DCM	M
2.1b.4	Develop a coastwide sampling protocol to collect metric data and seek funding to accomplish it.	<b>DMF, APNEP,</b> DWR, DCM	M
2.1b.5	Implement data collection of habitat metrics.	<b>DMF, APNEP,</b> DWR, DCM	M

***Recommendation 2.2. Continue to identify and field groundtruth strategic coastal habitats.***

2.2.1	Work with agencies to include strategic coastal habitat (SHA) priorities within DMS local watershed plans, <a href="#">and other restoration programs</a> .	<b>DMF</b> , DMS, DEQ	
2.2.2	Conduct fish and habitat sampling in SHA Region 3 to validate SHA selections and develop indicators.	<b>DMF</b>	M
2.2.3	Complete SHA Region 4 analysis	<b>DMF</b>	M

### **GOAL 3. ENHANCE AND PROTECT HABITATS FROM ADVERSE PHYSICAL IMPACTS**

***Recommendation 3.1a. Expand habitat restoration in accordance with restoration plan goals, including increasing subtidal and intertidal oyster habitat through restoration.***

3.1a.1	Identify the size and number of sanctuaries needed, and whether constructed intertidal reefs should be incorporated into the sanctuary network.	<b>DMF</b>	O
3.1a.2	Continue expanding the oyster sanctuary program.	<b>DMF</b>	O
3.1a.3	Establish a long-term monitoring program (oyster survival, growth, condition, recruitment) of oyster sanctuaries and cultch planting sites to assist with future siting, design, and management decisions.	<b>DMF</b>	O
3.1a.4	Identify alternative substrates for cultch and oyster sanctuary projects that are appropriate for larval settlement at intertidal and subtidal sites; compare the costs and benefits of them.	<b>DMF</b>	O
3.1a.5	Cooperate with university researchers <a href="#">on</a> new siting tools (eg. larval distribution and transport models) and monitoring protocols to maximize oyster restoration success.	<b>DMF</b>	O

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3.1a.6	Work with university researchers to monitor fish/invertebrate use of oyster sanctuaries and effect of oysters on local water quality.	<b>DMF</b>	O
<b><i>Recommendation 3.1b. Expand habitat restoration in accordance with restoration plan goals, including re-establishing of riparian wetlands and stream hydrology.</i></b>			
3.1b.1	Encourage local SWCDs to include strategic coastal habitat areas and other CHPP priorities in local priority ranking system for the Agriculture Cost Share Program, Community Conservation Assistance Program <a href="#">and Conservation Reserve Enhancement Program (CREP)</a> .	<b>DMF, DSWC</b>	S
3.1b.2	Work with the Corps of Engineers and the Department of Transportation on innovative mitigation projects and an appropriate crediting system for them under the DMS. Such projects may include the protection and restoration of SAV and oyster beds, and the removal of certain dams and other aquatic organism barriers, <a href="#">and enhancing wetlands through construction of living shorelines</a> .	<b>DMS, DEQ, DMF, DCM, DWR</b>	O, L
3.1b.3	Obtain funding to restore streams and associated wetlands designated as anadromous fish spawning areas in the Albemarle Sound area as implementation steps for the River Herring Fishery Management Plan.	<b>DMF, APNEP, DMS, WRC</b>	
<b><i>Recommendation 3.1c. Expand habitat restoration in accordance with restoration plan goals, including restoring SAV habitat and shallow soft bottom nurseries.</i></b>			
3.1c.1	<a href="#">Work with researchers to establish methods</a> to restore SAV.	<b>DMF, APNEP, DMS, DWR</b>	
<b><i>Recommendation 3.2. Sustain healthy barrier island systems by maintaining and enhancing ecologically sound policies for ocean and inlet shorelines and implement a comprehensive beach and inlet management plan that provides ecologically based guidelines to protect fish habitat and address socio-economic concerns.</i></b>			
3.2.1	<a href="#">Implement the beach and inlet management plan, and continue to require minimum criteria for monitoring beach nourishment projects to evaluate ecological effects.</a>	<b>DCM</b>	
<b><i>Recommendation 3.3. Protect habitat from adverse fishing gear effects through improved compliance.</i></b>			
3.3.1	Evaluate through the FMP process the need for further restrictions of bottom-disturbing gear.	<b>DMF</b>	O
<b><i>Recommendation 3.4. Improve management of estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of site specific conditions and advocate for alternatives to vertical shoreline stabilization structures.</i></b>			

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3.4.1	Encourage waterfront property owners to utilize the shoreline stabilization technique recommended for their shoreline type.	<b>DCM</b> , DWR	L
3.4.2	Encourage alternatives to vertical shoreline stabilization methods through permit requirements, fees, <b>and process simplification</b> , including but not limited to refining rule 15A NCAC 07H .2700 GP for Marsh Sills <b>and coordinating permit process changes with the Corps of Engineers (USACOE)</b> .	<b>DCM</b> , DWR	L
3.4.3	Promote efforts to educate the public and waterfront property owners on living shoreline benefits by 1) seeking funding and partnerships to increase the number of highly visible demonstration projects; 2) developing case studies as guidance for property owners; 3) engaging with contractors, realtors, and Homeowners Associations regarding design and benefits of living shorelines; and 4) enhance marketing and education initiatives to build public demand for living shorelines.	<b>DCM</b>	L
3.4.4	Promote research and monitoring of living shorelines to 1) examine effectiveness of natural and other materials of erosion control and ecosystem enhancement; 2) examine long-term stability of living shorelines and vertical structures, particularly after storm events; 3) map areas where living shorelines would be suitable for erosion control; and 4) investigate use of living shorelines as a BMP or mitigation option.	<b>DCM</b> , DWR, DMF	L
3.4.5	Update maps of <b>shoreline structures</b> in the CAMA counties.	<b>DCM</b>	L, M
3.4.6	Promote the appropriate use of oyster shells to facilitate habitat enhancement in living shoreline structures.	<b>DCM</b>	L, O
3.4.7	Work with NOAA's Technical Advisory Committee members in their sponsored research program "Ecological Effects of Sea Level Rise" to develop information/tools to better forecast and manage landscape responses of critical natural resources relative to sea level rise.	<b>DCM</b>	
<b>Recommendation 3.5a. Protect and restore habitat for migratory fishes by incorporating the water quality and quantity needs of fish in water use planning and management.</b>			
3.5a.1	Continue to study the feasibility and benefits of dam and barrier removal in general and for mitigation.	<b>DMF</b> , WRC, DWR, DMS	
<b>Recommendation 3.5b. Protect and restore habitat for migratory fishes by restoring fish passage through elimination or modification of stream obstructions, such as dams and culverts.</b>			
3.5b.1	Encourage research to determine the minimum acceptable culvert dimensions and characteristics that will allow passage of river herring and whether there are other causes inhibiting river herring from migrating upstream past culverts.	<b>DMF</b> , APNEP, DOT, WRC	

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3.5b.2	Survey previously identified Albemarle Sound river herring spawning areas to estimate current condition and spawning function, identify stream obstructions on river herring spawning streams, <b>and prioritize obstructions for herring-friendly replacement.</b>	DMF, WRC	M
3.5b.3	The Department, through the DWR and the DMS will pursue dam removal projects where appropriate.	DWR, DMS	
<b>Recommendation 3.8. Develop coordinated policies including management adaptations and guidelines to increase resiliency of fish habitat to ecosystem changes.</b>			
3.8.1	Direct outreach to local governments on sea level rise to allow coastal communities to assess needs and implement strategies to minimize hazard risk and increase environmental resiliency.	DCM	L
<b>GOAL 4. ENHANCE AND PROTECT WATER QUALITY</b>			
<b>Recommendation 4.1a. Reduce point source pollution discharges by increasing inspections of wastewater discharges, treatment facilities, collection infrastructure, and disposal sites.</b>			
4.1a.1	Identify research priorities regarding impacts of endocrine-disruptors and other chemicals to blue crabs and oysters.	DMF, DWR	
4.3a.1	Actively seek research of innovative technology to remove stormwater outfalls with 319 grant funding.	DWR, DEMLR	S
<b>Recommendation 4.3c. Prevent additional shellfish closures and swimming advisories by continuing to phase-out existing outfalls by implementing alternative stormwater management strategies.</b>			
4.3c.1	Implement new stormwater BMPs and Low Impact Development (LID) program to reduce runoff.	DEMLR	S
4.3c.2	Partner with NCDOT to retrofit road ditches that discharge to shellfish waters.	DEMLR, DWR, DMF, DOT	S
<b>Recommendation 4.4. Enhance coordination with, and provide financial/technical support for, local government/private actions to effectively manage stormwater, stormwater runoff, and wastewater.</b>			
4.4.1	Pursue funding for the Community Conservation Assistance Program with emphasis on CHPP stormwater priorities in coastal counties	DSWC, DEQ	S,L
4.4.2	Encourage development of effective local erosion control programs to maintain compliance and reduce sediment from reaching surface waters.	DEMLR	S
4.4.3	Provide education and financial/technical support (funding, training, equipment) for local and state programs to better manage sediment control measures from all land disturbing activities and enhance monitoring capabilities (ie purchase turbidity meters).	DEMLR, DWR	S

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4.4.4	Continue to educate the public, developers, contractors, and farmers on the need for sediment erosion control measures and techniques for effective sediment control.	DEMRL, DWR	S
<b>Recommendation 4.5a. Continue to improve strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat through voluntary actions, assistance, and incentives, including improved methods to reduce pollution from construction sites, agriculture, and forestry.</b>			
4.5a.1	Provide outreach to the public and government agencies on stormwater BMP techniques by holding workshops that include visiting project demonstration sites.	DEMRL, DCM	S
<b>Recommendation 4.6. Maintain effective regulatory strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat, including use of vegetated buffers and established stormwater controls.</b>			
4.6.1	Assess if coastal stormwater rules are effectively reducing non-point runoff.	DEMRL, DWR	S, M
<b>Recommendation 4.7. Maintain adequate water quality conducive to the support of present and future mariculture in public trust waters.</b>			
4.7.1	Investigate management needed to maintain open shellfish waters; encourage aquaculture that will enhance or minimize impacts to water quality that affect public trust uses.	DMF, DWR, DEMRL, DCM	S
4.7.2	Improve wastewater/stormwater management at coastal marinas.	DWR, DCM	
<b>Recommendation 4.8a. Reduce nonpoint source pollution from large-scale animal operations by ensuring proper oversight and management of animal waste management systems.</b>			
4.8a.1	Implement environmentally superior alternatives to animal waste lagoon and spray field systems.	DEQ, DWR	

Features/fields	Explanations
Black font	Carried forward from previous 11-13 IP
Red font	New from priority issue papers
Blue font	New or revision to existing
Pink	New, directly addresses priority issue
Priority Issues	Ind=Indicators; OR=Oyster restoration; Sed=Sedimentation; LS= Living shorelines.
Recommendation	Self explanatory
GoalRecSub	Shorthand notation for Goal.Recommendation(a-z subcategories)
Action	Description of specific action
Ancestor	Links similar actions across IP cycles
ActionID	Unique identifier for action (required)
Lead	Agencies responsible for implementing action
IP yr	Implementation plan year
Target year	Target date for complete status (status = incomplete if not complete by the end of IP cycle)
Status	C=Complete, I=Incomplete, PC=partially complete (no target date), NA=No action, U=Unknown, OH=On Hold, D=Discontinued
Status (long)	Detailed description of implementation progress (updated approx. yearly)
Status date	Date status was last updated

#### Acronyms

APNEP	Albemarle-Pamlico National Estuary Partnership
BMP	Best Management Practices
CAMA	Coastal Area Management Act
CHPP	Coastal Habitat Protection Plan
CRC	Coastal Resource Commission
DACS	Department of Agriculture and Consumer Services
DCM	Division of Coastal Management
DEMLR	Division of Energy, Mineral, and Land Resources
DEQ	Department of Environmental Quality
DMF	Division of Marine Fisheries
DMS	Division of Mitigation Services
DSWC	Division of Soil and Water Conservation
DWR	Division of Water Resources
EMC	Environmental Management Commission
HQW	High Quality Waters
MFC	Marine Fisheries Commission
NCFS	NC Forest Service
PNA	Primary Nursery Area
SAV	submerged aquatic vegetation
SCC	Sedimentation Control Commission
SHA	strategic coastal habitats
SWCC	Soil and Water Conservation Commission
WRC	Wildlife Resources Commission
USACOE	US Army Corps of Engineers

## **GOAL 1. IMPROVE EFFECTIVE OF EXISTING RULES AND PROGRAMS PROTECTING COASTAL FISH HABITAT**

*Recommendation 1.1. Ensure compliance with Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and Marine Fisheries Commission (MFC) rules and permits.*

*Recommendation 1.2a. Coordinate and enhance monitoring of water quality, habitat, and fisheries resources (including data management) from headwaters to the nearshore ocean.*

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*Recommendation 1.3. Enhance and expand educational outreach on the value of fish habitat, threats from land use and other activities, and explanations of management measures and challenges.*

*Recommendation 1.4. Continue to coordinate among commissions and agencies on coastal habitat management issues.*

*Recommendation 1.6. Enhance management of invasive species with existing programs. Monitor and track status in affected waterbodies.*

## **GOAL 2. IDENTIFY AND DELINEATE STRATEGIC COASTAL HABITATS**

*Recommendation 2.1a. Support assessments to classify habitat value and condition by coordinating, completing, and maintaining baseline habitat mapping (including seagrass, shell bottom, shoreline, and other bottom types) using the most appropriate technology.*

*Recommendation 2.1b. Support assessments to classify habitat value and condition by selectively monitoring the condition and status of those habitats.*

*Recommendation 2.2. Continue to identify and field groundtruth strategic coastal habitats.*

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*Recommendation 3.1a. Expand habitat restoration in accordance with restoration plan goals, including increasing subtidal and intertidal oyster habitat through restoration.*

*Recommendation 3.1b. Expand habitat restoration in accordance with restoration plan goals, including re-establishing of riparian wetlands and stream hydrology.*

*Recommendation 3.1c. Expand habitat restoration in accordance with restoration plan goals, including restoring SAV habitat and shallow soft bottom nurseries.*

*Recommendation 3.2. Sustain healthy barrier island systems by maintaining and enhancing ecologically sound policies for ocean and inlet shorelines and implement a comprehensive beach and inlet management plan that provides ecologically based guidelines to protect fish habitat and address socio-economic concerns.*

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*Recommendation 3.4. Improve management of estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of site specific conditions and advocate for alternatives to vertical shoreline stabilization structures.*

*Recommendation 3.5a. Protect and restore habitat for migratory fishes by:incorporating the water quality and quantity needs of fish in water use planning and management.*

*Recommendation 3.5b. Protect and restore habitat for migratory fishes by restoring fish passage through elimination or modification of stream obstructions, such as dams and culverts.*

*Recommendation 3.8. Develop coordinated policies including management adaptations and guidelines to increase resiliency of fish habitat to ecosystem changes.*

#### **GOAL 4. ENHANCE AND PROTECT WATER QUALITY**

*Recommendation 4.1a. Reduce point source pollution discharges by:increasing inspections of wastewater discharges, treatment facilities, collection infrastructure, and disposal sites.*

*Recommendation 4.3a. Prevent additional shellfish closures and swimming advisories by conducting targeted water quality restoration activities.*

*Recommendation 4.3c. Prevent additional shellfish closures and swimming advisories by continuing to phase-out existing outfalls by implementing alternative stormwater management strategies.*

*Recommendation 4.4. Enhance coordination with, and provide financial/technical support for, local government/private actions to effectively manage stormwater, stormwater runoff, and wastewater.*

*Recommendation 4.5a. Continue to improve strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat through voluntary actions, assistance, and incentives, including improved methods to reduce pollution from construction sites, agriculture, and forestry.*

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